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NEO-LITHICS 1/16
The Newsletter of Southwest Asian Neolithic Research
On several occasions we co-editors of Neo-Lithics have discussed a peer-reviewed and open access format of the newsletter, encouraged by repeated appeals from our colleagues to provide a publication opportunity that also serves the need to promote careers, e.g. by collecting impact points. We hesitated: We didn’t want to be just another peer-review network, with problems in transparency, with manipulation opportunities by selecting reviewers, for helping mainstream research topics and strategies, and the like. Knowing our capacities, we also wanted to avoid the immense administrative and moral work related to the organization of peer reviews. Rather we wanted to continue being a 1) direct gate to quickly publish information on important new findings from the Neolithic fields and labs with just a lighter editor-based reviewing, 2) an alternative for Neolithic topics not easily placed in other journals, 3) a place for field reports often considered not reviewable, and 4) especially a chance for young researchers – especially from the Middle East - outside existing research networks to launch their first publications under less severe conditions, to promote regional expertise. How to maintain these goals when introducing peer review?

The discussion is still ongoing and we seek your comments, advice, and collaboration. We can imagine to be an open access newsletter by applying testable standards of transparency, organizing a non-anonymous peer reviewing for our sections Field Reports and Contributions while keeping the “documentary” sections of reports on conferences, news on books and thesis, etc. unreviewed. Our sorrow is, however, that this might lead to the exclusion of worthy information presented by younger colleagues who do not meet advanced standards of research presentation and analysis. But this might become the chance for another type of reviewing, understanding it as coaching authors and raising the discursive levels of contributions by adding - in one way or another - the reviewers’ points of view? By reaching high quality contributions through strong acceptance hurdles, resulting from an intense transparent negotiation of results between the author and sponsoring or even nursing non-anonymous reviewers, we can make peer reviewing in Neo-Lithics an interactive motor for high quality Neolithic research, and an investment into the academic offspring as well. It would mean that we would need a much larger community of peer reviewers (or peer coaches), ready to be committed to this future format of Neo-Lithics. It even can result in a paradigm of another type and culture of peer review. Is this idea beyond academic reality, too much idealistic or even naïve?

Upon the publication of this editorial, we will launch this discussion also into the mailing list Forum Neo-Lithics, to open a broader discussion on a potential change of the Neo-Lithics format.

The co-editors Hans Georg K. Gebel, Marion Benz, Dörte Rokitta-Krumnow, joined by Gary Rollefson.
Investigations of a Late Neolithic Structure at Mesa 7, Wadi al-Qattafi, Black Desert, 2015

Gary O. Rollefson, Yorke Rowan, Alexander Wasse, Austin C. Hill, Morag Kersel, Brita Lorentzen, Khaled al-Bashaireh and Jennifer Ramsay

Introduction

The Eastern Badia Archaeological Project resumed its research program in the Black Desert of Jordan’s panhandle with a three-week excavation and survey season at Mesa 7 (hereafter M-7) in June, 2015. Earlier reconnaissance of the more than 20 mesas capped with Late Miocene Abed Olivine-Phyric basalt (Rabba’ 2005) on both the eastern and western sides of the Wadi al-Qattafi demonstrated dense distributions of more than 600 structures (not including animal pens) from Mesa 3 to Mesa 10 (Figs. 1 and 2).

Excavation in 2012 of SS-11, a small dwelling adjacent to an animal corral at Mesa 4 (“Maitland’s Mesa”), showed it to be one of 20 or more corbeled houses on the southern slope of M-4 (Wasse et al. 2012; Rollefson et al. 2014); at least 11 corbeled houses had attached animal corrals while nine did not. The buildings might represent two small hamlets distinguished by the presence or absence of attached animal enclosures. Charcoal from the interior of SS-11 produced a date of 6450 ± 40 B.P. (2σ 5480–5320 calBC [Beta-346614]). Betts has suggested that houses with attached animal pens are probably late developments in the Late Neolithic of the Black Desert (Betts 2013: 189), which would mean that the corbeled houses without animal pens could be from earlier in the Late Neolithic period.

One of the highest densities of construction was on the slopes and base of M-7, where more than 285 buildings could be identified from APAAME aerial photos (Rollefson et al. 2014: 296 and Fig. 16). In addition to the bewildering number of structures, there was also clear architectural variability, with many buildings erected using corbeling techniques and others characterized by walls of basalt slabs standing on edge/end. One structure in particular was of interest because it...
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evidenced a combination of the two general approaches. This building (SS-1, for “South Slope-1”) was selected for excavation due to its unique structural character as well as its potential for demonstrating architectural renovation over time.

Structure SS-1

SS-1 is a curvilinear building with external dimensions of c. 6.30 m NE-SW by 5.40 m NNW-SE (interior dimensions 4.60 x 4 m). Time constraints allowed only the western half of the building to be excavated, but this was enough for a general appraisal of its structural history. There are two major construction phases: the original circular structure that was abandoned eventually, followed by a remodeling phase with a new function that witnessed many occupational visits and cultural deposits until final abandonment. Finally, the collapsed structure was used as a small burial mound.

Phase 1

Phase 1 is represented by Wall 001, a thick (ca. 90-95 cm) double-leaf construction with rubble fill between the interior and exterior surfaces of the wall that was built on bedrock (Wadi Shallala Chalk formation). No clear evidence of a doorway was found for this phase, although an opening may have been made in the northern part of the wall and reclosed at a later time; it isn’t certain if this was during Phase 1 or during the succeeding period. It is possible that the main entrance was in the unexcavated part of SS-1. Wall 001 likely served as part of a corbeled structure. Almost nothing can be said about the nature of the occupation of SS-1 during this phase due to the activities of the people who first reconfigured the building in Phase 2.

Phase 2

Phase 2 appears to have been a long sequence of rebuilding and subsequent renovations. A new wall (Wall 002) was erected against the interior face of Wall 001 after the Phase 1 fill had been completely scoured down to bedrock, with thin basalt slabs that constituted Wall 002 set vertically on end (Figs. 3 and 4) beneath where the Phase 1 floor would have been. Wall 002 is curious, not only because there was a complete change in the orientation of the basalt blocks (and therefore a change in any kind of superstructure), but also because Wall 002 seems only to have continued around a semicircular arc inside the western half of SS-1. A single pillar ca. 40 x 30 x 100 cm was erected against the interior of Wall 001 at the northern end of Wall 002; another pillar of similar dimensions was raised in the center of the floor, and a third pillar at the southern
end of Wall 002 had collapsed inwards. Another set of
pillars, one partially collapsed, occurs at the center of
Wall 002 at the southwestern edge of the room.

The pillars at both ends of Wall 002 and the one
in the building’s center form a straight line that bi-
sects the building into generally eastern and western
halves. While Wall 001 in the eastern half could still
serve as the base for a corbeled roof, the half con-
taining Wall 002 in the other half would not have
served the same purpose. It is likely, in fact, that the
western half of SS-1 was left unroofed, and that only
the eastern half had some form of protection from the
elements.

Phase 2 provided the bulk of information about the
use of SS-1. The earliest layer of this phase included
making a shallow oval plaster basin (65 x 50 x 10 cm)
on the newly re-exposed bedrock adjacent to Wall 002
in the western part of the structure. After a brief period
of abandonment represented by a thin (ca. 3 cm) layer
of sediment, a second, slightly smaller plaster basin
was made directly above the first; traces of the use of
fingers to smooth the surface of the upper basin were
clearly visible (Figs. 5 and 6). The gypsum plaster
seems to be a finer and more durable material than the
plaster in the floor, basin, and alcove of house W-66
at Wisad Pools (Rollefson et al. 2012), although like
the plaster from Wisad W-66, the SS-1 plaster also
contained charcoal from burnt, small-diameter twigs
of the Chenopodioideae (goosefoot) sub-family of
Amaranthaceae. Like the charcoal from Wisad, these
Chenopodioideae twigs are most likely from Anab-
asis, which is a low woody shrub that grows in dry
steppe and desert environments, particularly on rocky
terrain (Cordova 2007).

Fire pits were common in the eastern (roofed?)
half of SS-1, including two that had been cut down
through earlier sediments of Phase 2 to bedrock. Ashy
deposits that filled and accumulated in the eastern half
were dense, thick, and widespread, again restricted
principally to the area east of the western and central
standing stones. Charcoal within these pits was abun-
dant. Of the 14 charcoal fragments larger than 2 mm
that were sampled, 12 could be identified, all of which
are from Amaranthaceae subfam. Chenopodioideae.
Chenopodioideae species in Jordan are all generally
low shrubs common in semi-arid and arid steppe and
desert, or degraded and saline environments. The
dense wood of Chenopodioidae taxa is considered a
high-quality fuel by the badia’s inhabitants even today,
and their leaves have additional fodder and medicinal
uses (Lancaster and Lancaster 1999: 174). Based on
the curvature of the phloem bundles, all of the SS-1
charcoal is from small-diameter stems, which would
have been easier to collect and transport to the site.

Two radiocarbon dates from early in Phase 2 are
stratigraphically consistent: sample 15 came from
Locus 026, the fill of a pit cut into Locus 0290, and sample 16 from Locus 029 yielded stratigraphically consistent dates: 6455-6580 calBC (2σ, calBP 8405-8340) for the first and 6490-6430 calBC (2σ, calBP 8440-8380) for the second. Since both radiocarbon dates are on short-lived, small-diameter stems, inbuilt age-related biases should be relatively small for both samples. Both radiocarbon dates are roughly a millennium later than structure SS-11 at M-4 (5480-5320 calBC, 2σ, calBP 7430-7280; cf. Wasse et al. 2002) but close to that from Wisad Pools structure W-66 (6600-6460 calBC [Beta-346621: 2σ, calBP 8550-8400]) (Rollefson et al. 2014: 291). Structure W-80 at Wisad Pools produced five dates, again stratigraphically consistent (6590-6580 and 6570-6440 calBC for the lowest layer, just above the floor [Beta-366676: 2σ, calBP 8540-8530 and 8520-8390] to 5710-5610 calBC and 5590-5570 calBC [Beta-366675: 2σ, calBP 7660-7560 and 7540-7520] to a layer near the top of the Late Neolithic fill of the structure) (Rollefson et al. 2014: 291).

Flotation samples were also productive for the recovery of carbonized plant material from the site. From the seven flotation samples taken several specimens of the genus Arnebia (Arnebia) were identified, which are commonly desert annuals or perennials and have roots that can produce a red dye (Feinbrun-Dothan 1978: 68-70). Seeds from the genus Astragalus (milkvetch) were noted and some species in the genus are common pot herbs and can be found in desert environments (Zohary 1972: 54-83; Townsend and Guest 1974: 231-442). Aizoon (stone crop) is a genus that has many species that are generally herbs or low-shrubs. These plants can be found in dry wadi stream beds and oases in hot deserts (Zohary 1966: 74-75). These three species of plants all flower in the spring, which points to an occupation period of the site in the late spring. Also found at the site was evidence of wild grasses in the form of carbonized grains and culms (stalks). The most interesting find from an archaeobotanical perspective is evidence of Ficus carica (fig) at the site. Not only have the achenes (seeds) of fig been identified but also carbonized fragments of the flesh (fruit). Fig is the first domesticated species in the Near East dating to the Early Neolithic period. However it is difficult to differentiate the wild species (F. persica) from the domesticated F. carica (Zohary 1966), but both have significant water requirements that may point to a more verdant environment around Wadi al-Qattafi during the Late Neolithic.1 However, figs may not have been grown locally since they have excellent storage properties and can be transported over long-distances.

Phase 2 consisted of a sequence of superimposed hearths and ashy deposits in the eastern half of SS-1 and a succession of flint-rich sediments in the “open air courtyard” of the western part of the building. In the eastern section there were two paving episodes (Locus 011 above Locus 024) separated by c. 30 cm of intervening sediment; paving stones were not coherent (if present at all) in the courtyard sector.

Phase 3

Locus 007, which might represent a ceiling collapse in the eastern roofed part of SS-1, marks the end of the intensive utilization of the building. Only a low remnant of the walls would have remained by the time sediment and basalt blocks had filled in the Phase 2 structure. Locus 006, adjacent to the east, is also probably part of the same collapse, although the slabs may have been re-arranged in post-abandonment Phase 3 to form a small expanse of capstones over Locus 009, a shallow burial. (Only a few bones were preserved, including a human tooth. It is possible that a headstone exists at the eastern edge of Locus 009 but it couldn’t be excavated this season).

Phase 3 is also marked by some reworking of Wall 001 near the far northwest part of the building. In addition to altering the wall (rather poorly; perhaps hastily in conjunction with the burial in Locus 009?), a U-shaped organization of boulders (rather than rectangular slabs) was built adjacent to Wall 001 in the north. It appears to have been an ad hoc construction that saw little duration of use.

Chipped Stone Artifacts

Tools

Chipped stone artifacts were numerous inside SS-1 as well as externally adjacent to the building. Table 1 presents the distribution of tool types. Some layers were virtual “burin sites”: it is notable that almost half (48.4%) of the shaped tools were burins of various sorts: 26% were simple or transverse burins, 11% were dihedral burins, and the rest were versions of truncation burins. Drills were the next most frequent tool at 11.3%. Scrapers made up 5.1% of the inventory, and knives of various sorts (including the “tabular/cortical tools”) made up 4.8% of the tool kit. Notches and denticulates were surprisingly numerous, with a combined total of 13%. For tools other than utilized and irregularly retouched pieces, blades and bladelets were used for 59.0% of the tools, 30.7% were on flakes, 2.7% on cores, and 7.6% of the tool blanks could not be determined. Among utilized and irregularly retouched elements, 68.6% were on blades, 26.9% on flakes, and 4.5% of the blanks were unclassifiable.

Projectile points were relatively numerous (Table 2). Of the identifiable types, Badia points (first described by Betts in McCartney 1992: 44; cf. Betts 1998: Fig. 4.14) were strongly represented (Fig. 7). The first three types listed in Table 2 were relatively light in weight (Fig. 8): Haparsa points averaged 0.3 grams, Nizzanim points 0.8 gm, and Herzliya points 0.6 gm. Badia points, on the other hand, ranged from 1.5 to 3.0 gm, averaging 2.2 gm. (One miniature Badia point is an outlier at 0.4 gm and is not included in the previous statistics). The bimodal distribution suggests that Badia points were probably used for larger game than the others.
There has been debate on the function of burins based on the absence of use-wear on many of these tools from burin sites (cf. Finlayson and Betts 1990). One suggestion for the predominance of this tool type is that they were not tools per se, but that they were cores for the spalls that were used as bead drills. While that observation might be true in some regard, Table 3 suggests that most bead drills were, in fact, made on unretouched seam flint. Among the knives were five examples that were bifacially retouched on pieces of seam flint. In addition, 31 large fragments of seam flint were cached against an interior corner of a low wall (Locus 019) just outside to the northeast of SS-1 (Fig. 9), and seven other pieces of unretouched seam flint were found inside the structure. The blanks and the knives averaged about 4.5 mm in thickness at midpoint, and 13 of the blanks had unpatinated scratch marks in the cortex.

**Cores**

Cores (Fig. 10) were relatively numerous (Table 4), reflecting intensive tool manufacture inside the structure. Cores producing flakes made up 56.5% of the classifiable cores (not counting the hammerstone), 33.4% were blade/bladelet cores, and 10.1% produced both flakes and blades (especially pyramidal, semi-pyra-

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### Table 1

<table>
<thead>
<tr>
<th>Tool type</th>
<th>n</th>
<th>%</th>
<th>%'</th>
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</thead>
<tbody>
<tr>
<td>Projectile point</td>
<td>72</td>
<td>4.4</td>
<td>5.4</td>
</tr>
<tr>
<td>Sickle</td>
<td>1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Burin</td>
<td>644</td>
<td>39.2</td>
<td>48.4</td>
</tr>
<tr>
<td>Truncation</td>
<td>45</td>
<td>2.7</td>
<td>3.4</td>
</tr>
<tr>
<td>Endscraper</td>
<td>16</td>
<td>1.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Sidescraper</td>
<td>52</td>
<td>3.2</td>
<td>3.9</td>
</tr>
<tr>
<td>Notch</td>
<td>98</td>
<td>6.0</td>
<td>7.4</td>
</tr>
<tr>
<td>Denticulate</td>
<td>75</td>
<td>4.6</td>
<td>5.6</td>
</tr>
<tr>
<td>Perforator</td>
<td>1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Awl/borer</td>
<td>30</td>
<td>1.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Drill</td>
<td>150</td>
<td>9.1</td>
<td>11.3</td>
</tr>
<tr>
<td>Unifacial knife</td>
<td>28</td>
<td>1.7</td>
<td>2.1</td>
</tr>
<tr>
<td>Bifacial knife</td>
<td>8</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Seam knife</td>
<td>5</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Tuwalian knife</td>
<td>20</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Tabular/cortical</td>
<td>2</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Backed element</td>
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<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Rectangular microflint</td>
<td>1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Bladelet, interior retouch</td>
<td>1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Bladelet, abrupt backing</td>
<td>2</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
<td>1.3</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>1331</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Retouched flake</td>
<td>39</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>Retouched blade</td>
<td>100</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>Utilized piece</td>
<td>148</td>
<td>9.0</td>
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</tr>
<tr>
<td>Unclassifiable</td>
<td>24</td>
<td>1.5</td>
<td></td>
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<tr>
<td><strong>Total</strong></td>
<td>1642</td>
<td>100.0</td>
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Table 1 Absolute and relative frequencies of chipped stone tools in the 2015 M-7 inventory.

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### Table 2

<table>
<thead>
<tr>
<th>Type</th>
<th>n</th>
<th>%</th>
<th>%'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haparsa</td>
<td>18</td>
<td>26.9</td>
<td>38.3</td>
</tr>
<tr>
<td>Nizzanim</td>
<td>5</td>
<td>7.5</td>
<td>10.6</td>
</tr>
<tr>
<td>Herziya</td>
<td>8</td>
<td>11.9</td>
<td>17.0</td>
</tr>
<tr>
<td>Badia</td>
<td>10</td>
<td>14.9</td>
<td>21.3</td>
</tr>
<tr>
<td>Byblis</td>
<td>4</td>
<td>6.0</td>
<td>8.5</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>3.0</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>(47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preform</td>
<td>10</td>
<td>14.9</td>
<td></td>
</tr>
<tr>
<td>Tang only</td>
<td>4</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Unclassifiable</td>
<td>6</td>
<td>9.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>67</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2 Projectile point types in the 2015 M-7 inventory.

---

### Table 3

<table>
<thead>
<tr>
<th>Type</th>
<th>n</th>
<th>%</th>
<th>%'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hammerstone</td>
<td>1</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Radial core</td>
<td>9</td>
<td>1.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Single face radial core</td>
<td>8</td>
<td>1.4</td>
<td>1.8</td>
</tr>
<tr>
<td>Micro-flake core</td>
<td>18</td>
<td>3.2</td>
<td>4.1</td>
</tr>
<tr>
<td>Core on a flake</td>
<td>22</td>
<td>3.9</td>
<td>5.0</td>
</tr>
<tr>
<td>Single platform, single face flake core</td>
<td>71</td>
<td>12.7</td>
<td>16.1</td>
</tr>
<tr>
<td>Single face, multi-face flake core</td>
<td>12</td>
<td>2.1</td>
<td>2.7</td>
</tr>
<tr>
<td>Single face, multi-platform flake core</td>
<td>25</td>
<td>4.5</td>
<td>5.7</td>
</tr>
<tr>
<td>Multiface, multi-platform flake core</td>
<td>69</td>
<td>12.3</td>
<td>15.6</td>
</tr>
<tr>
<td>Pyramidal core</td>
<td>5</td>
<td>0.9</td>
<td>1.1</td>
</tr>
<tr>
<td>Semi-pyramidal</td>
<td>17</td>
<td>3.0</td>
<td>3.8</td>
</tr>
<tr>
<td>90º change-of-orientation core</td>
<td>52</td>
<td>9.3</td>
<td>11.8</td>
</tr>
<tr>
<td>Single platform, single face flake core</td>
<td>78</td>
<td>13.9</td>
<td>17.6</td>
</tr>
<tr>
<td>Opposed platform, non-naviform blade core</td>
<td>11</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Other blade core</td>
<td>21</td>
<td>3.7</td>
<td>4.8</td>
</tr>
<tr>
<td>Bladelet core</td>
<td>23</td>
<td>4.1</td>
<td>5.2</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>(442)</td>
<td></td>
<td>100.0</td>
</tr>
<tr>
<td>Casual core/tested piece</td>
<td>34</td>
<td>6.1</td>
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</tr>
<tr>
<td>Unclassifiable</td>
<td>85</td>
<td>15.2</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>561</td>
<td>100.0</td>
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</tbody>
</table>

Table 3 Absolute and relative frequencies of drill types in the 2015 tool assemblage from structure SS-1.

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### Table 4

<table>
<thead>
<tr>
<th>Type</th>
<th>n</th>
<th>%</th>
<th>%'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>n</td>
<td>%</td>
<td>%'</td>
</tr>
<tr>
<td>Bladelet, symmetrical</td>
<td>52</td>
<td>35.1</td>
<td>38.8</td>
</tr>
<tr>
<td>Bladelet asymmetrical</td>
<td>25</td>
<td>16.9</td>
<td>18.7</td>
</tr>
<tr>
<td>Burin spall, symmetrical</td>
<td>24</td>
<td>16.2</td>
<td>17.9</td>
</tr>
<tr>
<td>Burin spall, asymmetrical</td>
<td>33</td>
<td>22.3</td>
<td>24.6</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>134</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Mèche de forêt</td>
<td>3</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Double-ended</td>
<td>1</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Bit only</td>
<td>10</td>
<td>6.8</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>148</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4 Absolute and relative frequencies of core types in the M-7 SS-1 sample.
north of the mesas (including one source of excellent quality material dark brown to black in color; the hilltop was also the location of a burin site c. 60 x 40m, with numerous burins of large size), as well as outcrops eroding out of WSC hills to the southwest of the mesas.

Flint of medium to fine quality – mostly of brown color – was found on pedestrian survey eroding out of Wadi Shallala Chalk (WSC) hills just opposite the mesas on the eastern side of the wadi. Other flint sources were also found on hills just beyond the large qa north of the mesas (including one source of excellent quality material dark brown to black in color; the hilltop was also the location of a burin site c. 60 x 40m, with numerous burins of large size), as well as outcrops eroding out of WSC hills to the southwest of the mesas.

**Ground Stone**

Groundstone artifacts were not particularly abundant (Table 5), but they nevertheless demonstrate plant processing inside the Phase 2 structure; four of the grinding slabs had been re-used as paving stones. The
number of grinding elements is in stark contrast to the case of SS-11 at Mesa 4 (“Maitland’s Mesa”), where only two small fragments were recovered from an area and volume of sediments even greater than the situation at SS-1 (Wasse et al. 2012). However, the intensity of plant processing at SS-1 pales in comparison to the near industrial scale of grinding at structure W-80 at Wisad Pools (Rollefson et al. n.d.), though it is possible that many more grinding stones will be recovered from the other half of SS-1.

Small Finds

Table 6 lists the small finds from the 2015 season. The number of beads of all types (n=30), including both whole and broken pieces, is far below the number of drills (see Table 1), which might mean bead production was intended for trade. Outcrops of Dabba marble and a coarse red stone were found on exposed WSC hills on the eastern side of Wadi al-Qattafi and at the northern edge of the large qa (“Landing Ground E” in the nomenclature of the British Royal Airmail service; Hill 1929) to the north of the mesas.

Four pieces of obsidian were recovered, including one bifacially retouched flake 56 x 37 x 12 mm. (Fig. 11). In addition, five pieces of clinopyroxene, a black, shiny crystalline mineral associated with volcanic activity were found, but the material, although superficially similar to obsidian, is essentially useless for tool production (Betts 1985).

Table 6  Small finds from SS-1, Mesa-7, 2015.

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grind stone slabs</td>
<td>10</td>
</tr>
<tr>
<td>Mortar</td>
<td>1</td>
</tr>
<tr>
<td>Hand stones</td>
<td>26</td>
</tr>
<tr>
<td>Scoria/pumice fragments</td>
<td>2</td>
</tr>
<tr>
<td>Sandstone palette fragments</td>
<td>5</td>
</tr>
</tbody>
</table>

Aerial Survey and 3D Recording

As part of the 2015 season, a limited aerial survey of M-7, M-8, and M-9 was undertaken using an Unmanned Aerial Vehicle (UAV). A series of flights with a fixed wing autonomous drone created a set of aerial images that could be post processed using Agisoft Photoscan Pro and ArcGIS. These images were used to create a high-resolution map of the landscape around M-7 and served as a pilot project for a larger survey of the Qaraqer Wadi Qattafi area in order to document the extant structures on the surface (see Fig. 12).

Additionally, SS-1 was recorded throughout the ex-
Field Reports

Discussions

One of the reasons SS-1 was selected for excavation was that its architectural differences compared to structure SS-11 at Mesa-4 ("Maitland’s Mesa") suggested there may have been coincident cultural variability associated with temporal change and/or activity distinctions. Unfortunately, there is no clear evidence for how the first configuration (Phase 1) of SS-1 at M-7 was used due to the removal of original occupational deposits in Phase 2, but based on the dimensions of Wall 001, it is likely that Phase 1 represents a residential building, perhaps one that was corbeled. Phase 2, on the other hand, appears to be a workshop that was the locus of a large inventory of chipped stone tools (Rollefson et al. 2013; Rowan et al. 2015) produced a large inventory of chipped stone tools (Rollefson et al. n.d.). W-80 was a large, complex oval building (c. 5 x 6 m) that began as a corbeled dwelling, but after the original roof collapsed the walls were used as a windbreak for various activities. The volume of sediments dug from W-80 is well over twice the amount excavated during the 2015 season at SS-1. The number of tools at SS-1 is relatively higher than at W-80 (1642 for the western half of SS-1 vs. 2346 from all of W-80), although the number of cores is roughly proportionally equal (561 for the west half of SS-1 vs. 1066 for all of W-80). Perhaps the most striking differences lie among the tools: Projectile points account for 27.2% of the W-80 tools (n=629), while they reach only 5.4% at SS-1 (Table 1). Among the arrowhead types, 85.2% are transverse types at Wisad Pools, while not a single example was recovered at Mesa 7; on the other hand, large and heavy Badia points make up almost 15% at SS-1, while none have been found at W-80 or any other excavated structure at Wisad Pools. Badia points occur in the earlier levels at Site 27000 at Burqu, approximately 65 km north of Wisad Pools, but they disappear and are replaced entirely by transverse arrowheads in the later Late Neolithic layers (Betts et al. 2013:93).

Other principal differences include burins, where the heavy representation at SS-1 (48.4%) far exceeds the weak figure of 2.5% at Wisad W-80; burin classes were also very different, with truncation types at 66.3% at SS-1 vs. 40.4% at W-80 (cf. Rollefson 1995). Despite a large number (n=80) of beads recovered from W-80, bead drills were scarce (4.1%); at SS-1, there were 30 beads but bead drills were 9.1% of the tools.

The differences of the tool inventories between M-7 SS-1 and M-4 SS-11 are probably heavily influenced by differences in activities undertaken at the two locations and the large amount of time between the two

Fig. 12 Orthophoto of a cluster of buildings in the SS-1 area. North is at the top of the picture. (photo: A.C. Hill)
occupations. Furthermore, the visits to M-7 SS-1 were probably much more frequent and each of longer duration than the presence at M-4 SS-11. The comparison of the SS-1 inventory with W-80 does not involve much time between the two occupational sequences, so the distinctions probably lie more in the kinds and intensities of activities carried out at the two buildings: both buildings appear to have served as workshops, but SS-1 was apparently more closely directed to whatever pursuits are represented by burins, whereas W-80 (with its strong focus on grinding stones) might have been more of a domestically oriented occupation.

Concluding Remarks

Excavations will be resumed in the summer of 2016 in order to finish the exposure of SS-1 and to investigate its relationship to other buildings in the immediate vicinity. Additional drone mapping of the mesas will be carried out in the spring of 2016, and additional aerial survey will be resumed in the region the following summer.

Acknowledgments: We are indebted to the Department of Antiquities personnel for their continued enthusiasm for the goals of the Eastern Badia Archaeological Project. We have received considerable support and assistance from Dr. Barbara Porter and the staff at the American Center of Oriental Research (ACOR) and from the Council for British Research in the Levant (CBRL). Institutional support and financial assistance has been provided by Whitman College, the Oriental Institute of the University of Chicago, and East Anglia University. Field work was facilitated by the participation of Kathleen Bennallack, Blair Heidkamp, Jackson Somerville, Chris Yeoh, and Mohammad Nasser.

Endnotes

1 Notably, there is evidence from Soreq Cave speleothems for high precipitation from 8,500 to 7,000 bp (Bar-Matthews et al. 2000).

2 It is not impossible that Phase 1 included the construction of Wall 002, in which case Phases 1 and 2 should be considered to be the same phase. However, the incongruity of the architectural ensemble renders this an unlikely scenario.

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A Late Natufian and PPNA Settlement in North-East Jordan: Interim Report on the 2014-2016 Excavations at Shubayqa 6

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Introduction

Pedestrian survey along the northern edge of the Qa’ Shubayqa in October/November 2012 resulted in the discovery of a large, hitherto undocumented prehistoric settlement (Richter et al. 2012). Collection of surface artefacts strongly hinted that this site may have a PPNA occupation phase. Three seasons of excavation under the auspices of the University of Copenhagen’s Department of Cross-Cultural and Regional Studies have produced evidence for a substantial settlement that was occupied from the late Natufian to the late PPNA.

Although recent work in north-east Jordan and elsewhere in the Harra and Hamad has begun to dispel the idea that this region was a ‘marginal’ or ‘peripheral’ zone throughout prehistory (e.g. Akkermans et al. 2014; Müller-Neuhof 2014; Richter 2014), evidence for the transition from hunting and gathering to the earliest cultivators, the Epipalaeolithic-Neolithic transition, has to date remained more elusive (Richter and Maher 2013). Thus, most summaries of the emergence of early Neolithic society in the Levant have suggested that the eastern, more arid zone of the Levant was likely occupied by groups that retained a hunting and gathering lifestyle and continued to be more mobile than their plant cultivating, sedentary PPNA cousins further west in the Jordan Valley and north along the Upper Euphrates (e.g. Belfer-Cohen and Bar-Yosef 2000; Kuijt and Goring-Morris 2002; Bar-Yosef 2008). Given the paucity of evidence available so far, this seemed a reasonable assumption. However, our work is beginning to show that the picture may be more complex. In this interim report, we describe the fieldwork carried out at Shubayqa 6 since 2014, which provides evidence for a substantial settlement that was occupied across the transition from the late Natufian to the PPNA.

Shubayqa 6 is situated in the Black Desert of north-east Jordan, c. 22 km north of the modern town of Safawi and 130 km north-east of the capital Amman at UTM 37S 334076/3586839 (Fig. 1). The Natufian sites of Shubayqa 1 and Shubayqa 3 are situated 0.7 km west and 3.1 km south-east respectively. Shubayqa 6 is a 2-3 m high mound which sits atop a low terrace to the immediate north of the Qa’ Shubayqa (Fig. 2). The mound appears to consist almost entirely of anthropogenic deposits, as well as structures built of local basalt. Chipped stone and basalt ground stone artefacts cover the mound and surrounding area, totalling c. 3,000 m². The majority of the extant surface architecture appears to date to the Bronze Age, Byzantine/early Islamic period, and later constructions that are probably medieval, post-medieval and modern in date. The Bronze Age structures consist of a circular wall that incorporates a burial cairn at its southern edge (see below). There are at least five rectangular buildings which, according to surface finds of pottery, appear to date to the late Byzantine/early Islamic period. At least seven Muslim graves are located on and around the mound, some of which sit on top of the rectangular structures. A number
of circular enclosures were built later on top of the rect-
angular buildings, but they are difficult to date. In ad-
dition to the PPNA architecture exposed in excavation
(see below), several partially buried circular walls were
also observed on the surface of the site, which could
date to the Neolithic occupation.

Excavation Methods

In 2014, we excavated an evaluation trench (6 m east-
west by 2 m) at the eastern edge of the site, as well
as a 1 x 1 m test unit at the top of the mound. These
units were excavated to determine the presence, depth
and preservation of sub-surface archaeology and to
obtain stratified samples of material culture, fauna
and botanical remains. Subsequently, a 10 x 10 m
area incorporating the 2014 evaluation trench was
opened in 2015. Excavations continued in this area
in 2016. The area was sub-divided into four squares
labelled A1-A4. Each square was sub-divided into 1 x
1 m or 0,5 x 0,5 m units where warranted (e.g. where
deposits immediately above floors were reached). Ex-
cavated sediment was dry-sieved on site, the residue
collected, washed and sorted into find categories at the
dig house. A minimum of ten litres of sediment was
collected from every deposit for flotation, while 200 ml
reference soil samples for pollen and phytolith analysis
were also collected. Excavations combined the use of
a single-context recording system with excavations in
arbitrary horizontal and vertical units (‘spits’), where-
by the natural boundaries of sediments were always
respected. Bulk finds were collected by square, context
and – where applicable – spit, while special finds (e.g.
worked bone) were point-provenienced using a total
station. In addition to standard digital photography and
hand drawn plans and sections, we utilised more ad-
vanced digital recording techniques to create 3D mod-
els of excavated features and excavation areas.

Excavated Features

Excavations in the main area have revealed a dense
and complex arrangement of architecture and features.
The latest phase uncovered in the excavation area is a
segment of the circular wall that encloses most of the
mound. The wall truncated earlier deposits in Squares
A2 and A4. This wall was constructed of unworked ba-
salt boulders, which was preserved only to a height of
1-2 courses. A fragment of early Bronze Age ceramic
was found immediately beneath the wall following its
removal during excavation. Late Chalcolithic and early
Bronze Age ceramics were found in low frequencies
in the vicinity of the wall. This and a single 14C date
suggest that the mound was occupied during the late
Chalcolithic/ early Bronze Age, when it was possibly
part of a funerary monument. This is suggested by the
cairn that is situated on top of the mound, which ap-
pears to be connected to the circular enclosing wall.
Within Square A1 a circular cairn built of unworked
basalt blocks was exposed (Space 10, Fig. 3). At the
centre the remnants of a disturbed stone-lined cist were
exposed, which contained the semi-articulated and
disarticulated remains of at least three individuals. Ex-
cavation of this feature could not be completed during
the 2016 season and further human remains were left unexcavated inside the cist. The cairn reuses an earlier circular structure, which probably dates to the PPNA. No material culture that could clearly be identified as belonging to the burials in the cist was recovered. However, a piece of copper was recovered near the cairn. Cist burials or cairn funerary monuments are unknown from the PPNA, but are common in the Chalcolithic and Bronze Age in the Levant. These observations as well as the piece of copper, the single late prehistoric \(^{14}\text{C}\) date and the thin spread of late Chalcolithic/ early Bronze Age pottery, suggest that this cairn likely dates to the same time frame.

A deep pit which truncates earlier PPNA deposits and structures was found in the south-west corner of A3. This pit may be related to the suspected late prehistoric burial cairn on top of the mound. Basalt slabs including some re-used groundstones were set at angles to line the large cut in several layers.

The next clearly visible phase at the site appears to be confined to Squares A1 and A3, where one complete building (Space 3) and several circular structures (Spaces 7, 8 and 9) were exposed. This architecture overlies other structures, of which parts were exposed in A2, A3 and A4. Space 3 is an oval structure constructed of carefully selected large, rectangular and flat basalt slabs, as well as some orthostatic basalt stones (Fig. 4). The building has at least two phases: the southern wall is of a less careful construction and appears to be a later rebuild. Two superimposed stone-lined fireplaces were excavated at the centre of the building, surrounded by well-made mud plaster floors. A series of internal post-
holes suggest a roof superstructure made of organic materials. A number of basalt handstones were found lying in front of the southern wall of this space. Space 7 was also excavated down to a floor and also produced a stone lined fireplace. Spaces 8 and 9 have not been completely excavated yet. This phase of architecture sits on top of rich midden deposits characterised by a humic soil matrix.

An earlier phase of occupation consisting of a series of circular and sub-circular buildings was exposed in A2, A3 and A4. Space 1 was already partially exposed in the 2014 evaluation trench. This large circular structure measures nearly 5 m in maximum diameter. A ‘bench’ or later wall was built in front of the original exterior wall. One fireplace inside this structure has already been exposed, which was built on top of an earlier fireplace (not yet excavated). To the south in Square A4, three small circular and oval structures (Spaces 2, 5 and 6) were exposed and partly excavated. These are too small to be inhabitation structures, but their actual purpose is not clear at present. Space 4 occupies most of A3, measuring at least 5 m in diameter. This building has a complex construction history with numerous phases. Once, this area probably was an outdoor space, as it contained a fireplace and an oval stone alignment situated atop a midden and substantial collapsed building material. The midden beneath proved to be extraordinarily rich in finds. Numerous beads, ground- and chipped stone artefacts, as well as worked bone, animal bone and botanical remains were recovered from this area. A cache of basalt handstones was found placed in front of the eastern wall of the structure. This secondary use of the space seems to be characterised by its use for discarded waste and processing activities in an external area. Burnt and fire-cracked fist-sized basalt rocks were very frequent throughout the midden suggesting that the waste from cooking activities were dumped here. As the various spits of the midden were excavated it was clear that many flat handstones were often left close to the walls of this space.

**Radiocarbon Dates**

Six charred pieces of plant material from Shubayqa 6 were submitted for dating by Accelerator Mass Spectrometry (AMS). The calibrated ranges cluster between 12,400–10,600 cal BP (10,400–8,640 cal BC) at 68.2% probability or ±1σ. One sample provided a date of 5,710–5,615 cal BP (3,765–3,665 cal BC; 68.2%) (Fig. 5). This late date from a context close to the modern surface confirms the late Chalcolithic/ early Bronze Age occupation at the site already indicated by the ceramic finds from the excavations. The other five dates come from stratigraphically earlier deposits. The dates are stratigraphically coherent and derive from contexts in the 2014 evaluation trench and the soundings. Two of these dates fall within the Late Natufian time frame, while POZ-76082 straddles the transition between the Late Natufian and the early PPNA. The final two dates correspond to the late PPNA in the southern Levant. These dates suggest that Shubayqa 6
was occupied during the late Natufian and possibly throughout the PPNA. This makes Shubayqa 6 an unusual site as most Late Natufian sites were abandoned and not reused during the PPNA (see below).

Material Culture and Other Finds

Only a small sample of the chipped stone industry from Shubayqa 6 has been studied so far. The analysed material comes from the lower levels of fill in Space 1, which represents one of the earliest phases excavated at the site so far. The chipped stone assemblage is dominated by flint, in addition to small amounts of chalcedony and obsidian. Neither of these two latter raw materials are available locally, and the nearest known sources of flint lie some 70-90 km south of Shubayqa 6 (Betts 1998). Chalcedony is known from sources east of the Azraq oasis (Betts 1998: 34). The obsidian from Shubayqa 6 has not been sourced yet, but the nearest obsidian sources are located in southwestern Turkey, some 790 km away (Carter et al. 2013).

The lack of locally available flint let the inhabitants of Shubayqa 6 carry out the initial stages of stone tool production at the source location. This is reflected in the assemblage by a lack of initial platform tablets and low numbers of primary pieces. The lack of cortical pieces indicates that flint knappers pre-shaped the nodules before they brought them to the site. The amount of debris/shatter is low, resulting in a low ratio of debris to cores and tools. This could reflect an attempt to maintain an efficient reduction strategy at the site in order to conserve raw material.
The chipped stone industry at Shubayqa 6 is heavily flake-orientated, and flakes outnumber both blades and bladelets by more than double in the debitage. This is a typical trait of both Natufian and PPNA lithic industries. Bladelets clearly outnumber blades in the assemblage, but it seems likely that this is a reflection of raw material constraints (small nodules) rather than a cultural prevalence for bladelets. Tools are dominated by informal flake-tools, usually utilized or lightly retouched. Perforators make up nearly 25% of the tool assemblage, and clearly outnumber all other formal tool categories. High numbers of perforators are a typical PPNA trait, but the unusually high numbers at Shubayqa 6 could be seen in relation to an intensive on-site bead production (see below). Although the sample that was studied intensively yielded no projectile points, el-Khiam and Salibiya points were recovered from other parts of the site. The assemblage from the 1x1 m sounding showed an increase in the number of geometric microliths with depth, with abruptly backed lunates becoming more common lower down in the sequence. This further supports the notion of a late Natufian phase at Shubayqa 6 (Fig. 6).

Due to the large number of ground stone tool fragments and debitage, they were collected in bulk according to context and square/spit, while complete tools found in association with floor surfaces were considered special finds and point-provenanced. The assemblage awaits detailed analysis but a few observations can be noted. Most of the ground stone tools seem to be related to the Neolithic occupation of the site. Discoidal- and ovate shaped handstones are prevalent and, as mentioned above, several of these were found abutting interior wall faces within Spaces 3 and 4 (Fig. 7). Basin-type querns also seem to be common; one of these was reused as building material in the wall of Space 3. In addition to the more frequent tool types, a few pestles, vessel-mortars (Fig. 8) and grooved stones have also been recovered. Large boulder mortars, like the ones observed at the nearby Natufian site Shubayqa 1 (Richter et al. 2012), have not been found at Shubayqa 6 so far. The prevalence of grinding tools, i.e. handstones and querns, seems to reflect what is commonly observed in Levantine Neolithic ground stone assemblages (Wright 1992, 1994).

The site has also produced a very rich assemblage of faunal remains. Only a very small proportion of the material from the evaluation trench, the sounding and Space 2 have been analysed at this stage. The species present include gazelle with lower numbers of onager, sheep, fox, hare, cattle, tortoise as well as a range of wetland birds. Several large canid bones were also recovered from Space 2. A high proportion of all the faunal remains have passed through the digestive tract of animals clearly displaying the characteristic signatures of acid damage causing enlargement of foramen and the porous structure of trabecular bone, faceting of surfaces and sharpening of edges. Together this suggests that dogs were probably companions to the human population during the PPNA. Compared to the faunal evidence for Natufian occupation at Shubayqa 1, hare were a more frequent component of the hunted prey and its possible that hunting activities with dogs could have enabled this evasive animal to be more effectively caught.

The archaeobotanical work carried out so far includes a total of 207 flotation samples (more than 3000 litres of sediment processed). Overall, macrobotanical preservation at Shubayqa 6 is excellent. The preliminary analyses of the plant macroremains indicate the presence of riparian trees such as *Fraxinus* sp. (ash), *Vitex* sp. (chaste tree) and *Tamarix* sp. (tamarisk) suggesting that a wetland existed nearby. This matches the palaeoenvironmental information obtained from the archaeobotanical material from Shubayqa 1. The non-woody plant macro remains comprise cereals such as wheat and barley along with a large proportion of wild plants, including *Cyperaceae rhizome-tubers*. Future analyses will elucidate whether the inhabitants of Shubayqa 6 were gathering wild resources or had already started plant food production activities such as cereal cultivation.

More than 2000 stone beads, roughouts and waste fragments related to bead production have been recovered from Shubayqa 6 to date (Fig. 9). The vast majority of these were made using Dabba marble greenstone, although other types of stone, as well as avian shell and bone were also occasionally used. This material chimes with the large number of chipped stone drills and grooved basalt artefacts, which are likely related to bead production (Wright et al. 2008). It is not quite clear at present why this settlement became a locus for bead production given that the nearest known greenstone raw material sources are located c. 70 km away. A more detailed study of the bead assemblage

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**Fig. 7** Cache of basalt handstones in front of the eastern wall of Space 4. (Shubayqa Archaeological Project)
of types similar and specific to those found throughout the southern Levant from the Upper Paleolithic through the PPNC (Bar-Yosef Mayer 2013). There are a number of pieces of worked bone, with bone points being the most common. One unusual piece of worked bone of unclear function was recovered from deposits associated with typical PPNA material culture in Space 4 (Fig. 10): the rib of a medium-sized mammal was cut into a T-shape and polished smoothly. Three groups of incisions were made on the external polished surface; four small holes were drilled in the broadest part. The function of this object is not clear at present, although the four holes may suggest that it was used as a pendant or was attached to garment. A further unusual object from Shubayqa 6 is an anthropomorphic chalk figurine (Fig. 11). The figure has an oblong top part, a thick middle section and a broad base. Two arms were worked out from the main section, one of which shows a pattern of hatchet pattern of incisions. Further incision and cut marks can be seen in the upper part and along the base.
Conclusion

Our excavations at Shubayqa 6 to date demonstrate that this site was a substantial settlement that appears to have its origins in the Late Natufian and continued to be occupied throughout the PPNA. Its complex architecture, rich material cultural assemblage, as well as evidence for apparently intensive plant collection demonstrates that the Harra was not occupied by mobile groups focused predominantly on hunting during the late Natufian and PPNA, as has often been suggested. Shubayqa 6 has all the hallmarks of a sedentary settlement, characterised by intensive exploitation of edible plants and animals. Although additional excavations and further analysis of the finds from the site are necessary, Shubayqa 6 demonstrates that the emergence of the cultural and economic patterns that characterise the PPNA happened in the Harra at the same time as in the Jordan Valley and on the Upper Euphrates. The Levantine Corridor of the early Neolithic agricultural revolution was therefore probably much wider than previously thought and incorporated the semi-arid zone east of the Jebel Druze. Further work at Shubayqa 6 will allow us to investigate to what extent the late Natufian and early PPNA economy of the settlement was based on emergent plant management strategies. Due to its excellent preservation of macrobotanical remains and successive occupation from the Late Natufian to the end of the PPNA, further work at Shubayqa 6 promises a rare insight into how the economic, social and cultural parameters of gathering-hunting societies changed from the end of the Pleistocene to the beginning of the Holocene.

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A Decorated Bone ‘Spatula’ from Göbekli Tepe. On the Pitfalls of Iconographic Interpretations of Early Neolithic Art

Oliver Dietrich and Jens Notroff

Introduction

Göbekli Tepe is well known for the monumental architecture of its older Layer III which dates to the Pre-Pottery Neolithic (PPN) A (Schmidt 2012; for radiocarbon data cf. Dietrich et al. 2013). Up to 4 m high monolithic T-shaped pillars were arranged in circle-like enclosures around two taller (> 5.5 m high) central pillars (Fig. 1). The pillars are interconnected by walls and stone benches and are decorated with various animal motifs, but also with highly abstract symbols. In some cases arms, hands and items of clothing demonstrate unambiguously that the pillars represent stylized anthropomorphic beings (Fig. 2). There is clear evidence to see the site in the context of Early Neolithic cultic ritual (e.g. Dietrich and Notroff 2015). A younger phase (Layer II, early and middle PPNB) consists of smaller rectangular buildings, often featuring just two small central pillars or none at all. Besides the architecture, every excavation at Göbekli Tepe has produced a large amount of remarkable iconographic finds, such as reliefs, sculptures, decorated shaft-straighteners, and plaquettes. One of these finds, a rather enigmatically decorated bone artefact, lies at the focus of this short contribution. It highlights the manifold challenges when engaging with the archaeological interpretation of images.

A Find and Many Questions

In 2011 a special object was discovered at Göbekli Tepe in one of the excavation trenches in the tell’s northwestern depression (area K10-45, Locus 7.2; Fig. 3). Excavation had just proceeded into layers undisturbed by modern ploughing, but there were still no traces of architecture, when the fragment of a bone object was found (Fig. 4). The artefact was described preliminarily as a ‘spatula’ made from a rib bone. It measures 5.3 x 1.9 x 0.3 cm and carries a carved depiction that is only partially preserved. The image is unclear, however the upper part features two hatched T-shaped forms, one of which is completely preserved, the other only fragmentarily. These T-shapes rapidly led to associations with Göbekli Tepe’s most prominent architectural feature, and to a vivid discussion within the research team focusing on the probability of this interpretation and our comprehension of Neolithic art in general. Indeed, due the complexities of the find the decision was made in 2011 to refrain from any form of premature interpretation. In the meantime, the object was put on display in the Şanlıurfa Museum, where it has since attracted the attention of visitors. Although their interpretation generally follows the same line as ours in 2011, it has since taken on more speculative and esoteric slants (Collins 2016). For this reason, it is essential that we return to this object to discuss in more detail the question of its ‘readability’ and the nature of the Neolithic depiction.

Fig. 1 Enclosure D at Göbekli Tepe. (photo: DAI, Orient Department, N. Becker)
A Framework – or Limits – for the Interpretation of Prehistoric Art

There is an ongoing discussion about the possibilities and pitfalls of interpreting art in archaeology. One aspect of this debate is the potential use of iconological approaches. Among the most influential models is Erwin Panofsky’s concept which he presented in the 1930s (1934, reprinted in 1982). Panofsky identifies “three strata of subject matter or meaning” (Panofsky 1982: 28, 40-41), e.g. levels of inference on the intentions and messages encoded in images by the artist. His ideas have influenced generations of art historians and have also been used widely in Classical Archaeology. In Prehistoric Archaeology they do not seem to have reached a similar impact, although some examples of successful application exist (e.g. Orrelle and Kolska Horwitz 2016). This limited use of Panofsky’s ideas is obviously related to his basic assessment of interpretational possibilities (e.g. Schulz 2010: 84-86).

The first level of meaning is the “primary or natural subject matter”, the perception of basic forms as representations of natural objects, e.g. humans, animals, plants or inanimate objects and their spatial setting or possible interactions. On this level, interpretation...
in Panofsky’s view does not reach beyond the natural meaning of things; it is a basic pre-iconographical description that can be reached without further cultural knowledge.

On the second level, basic motifs are combined and identified with cultural-specific themes or concepts (Panofsky 1982: 29-30). Panofsky’s most often cited example for this stratum is to recognize a group of persons seated at a dinner table in a certain arrangement as a representation of the last supper. This iconographical interpretation or understanding needs additional information. If one lacks the acculturation in a society for which these topics are understandable, written sources or other means of information are needed for a correct interpretation.

The third level of interpretation, the iconology, targets the “intrinsic meaning or content”, i.e. the intentions of the artist in displaying an image just in that way, the messages he wanted to send about his subject, or the historical and political context in which the work was made. The iconological analysis thus tries to elucidate the symbolic values of images. In Panofsky’s (1982: 41) words, what is needed to achieve this is “synthetic intuition, a familiarity with the essential tendencies of the human mind, conditioned by personal psychology and Weltanschauung”. And of course all the insights gained from interpretation levels 1 and 2.

That in mind, the challenges in reading and interpreting prehistoric art become obvious. As soon as such depictions cross the line to abstraction and symbolism, familiarity with their proper cultural context and knowledge of their connotations is inevitably necessary to perceive and understand these codes.

In particular, this includes us today. Without the cultural intimacy with narratives and concepts linked to these depictions and symbols we could at best guess what is a) depicted and b) meant. Unfortunately, this presents a large probability of misconception, much like discovering the symbol of the cross in a Christian church, yet lacking any knowledge of the whole Passion narrative for which it stands but which is perceived without further explanation by members of most occidental cultures and even beyond.

To be useful for Prehistoric Archaeology, Panofsky’s thoughts must be adapted to the specific sources of this discipline. The need for a broad understanding of the cultural setting of images for an iconographical analysis (Level 2) is a requirement hard to fulfill completely, especially when only material remains are available without written sources. But to some extent, this lack can be compensated for by find contexts on a macro (site-) and micro (deposition-) level, and through analogical reasoning (e.g. Eggert 2010: 69-70; Orrelle and Kolska Horwitz 2016). Although there are several more theoretic approaches to images, mostly derived from semiotics or communication theory (e.g. Belting 2001; Juwig and Kost 2010; Sachs-Hombach 2003; with special reference to the Neolithic: Morenz 2014), Panofsky’s model has the advantage that it addresses the ‘readability’ of an image as a key factor for a successful analysis. It thus seems appropriate to analyse the possibilities of understanding an ambiguous prehistoric depiction like the one on the ‘spatula’ from Göbekli Tepe.

**Pre-Iconography and Iconography: Architecture, an Animal, or Something Completely Different?**

Göbekli Tepe is a special site that lacks domestic architecture as known from contemporaneous sites so far (Dietrich and Notroff 2015). The circular enclosures of the earlier (PPNA) layers feature a rich iconography, mostly based on zoomorphic motifs, depicted in flat and high reliefs, as well as in the form of three-dimensional sculptures and of incisions in smaller objects that in some cases seem to have no other function than to carry these signs (especially small stone plaquettes - Morenz and Schmidt 2009). Depictions of humans are scarce in reliefs and on small objects, but are more common among sculptures. So far there is only one case in which possibly inanimate objects are depicted (see below).

The archaeological context of the bone spatula is rather uncertain. It was found immediately below the plough horizon within a deposit without architectural
remains or walking levels. There are however two fragments of comparable ‘bone spatulae’ from Göbekli Tepe with clear proveniences. Both objects have incised geometric decorations. One was found in a deep sounding excavated for the construction of a permanent shelter above the site, north of Enclosure D (area L9-69, Locus 163.5; Fig. 5a). As this sounding had limited dimensions, the stratigraphic relation of the reddish sediment (rich in charcoal and animal bones) with Enclosure D cannot be established with certainty at the moment. The second piece (Fig. 5b) stems from an area with wall debris, probably of Layer II-buildings, in the south of the main excavation area (area L9-58, Loc. 55.2). Besides the insight that objects of this kind may span the whole duration of the site, the contexts of the intra-site analogies are unfortunately rather uninformative.

A pre-iconographical description can thus only be reached by use of intra- and offsite analogies for the decorations, which is made difficult by the ambiguous execution of the depiction. Panoćsky (1982: 33) saw this issue as a main problem in describing an image correctly. He adds that our practical experience must be the basis for any recognition of an object matter, but can also be an obstacle that leads to a false interpretation.

This is exactly the case with the bone spatula. From the moment of its discovery some colleagues were convinced that the T-shaped objects on the spatula must be representations of the iconic find category of Göbekli Tepe’s archaeological record: the T-shaped pillars. In adherence to this line of thought, a roughly human shaped figure was interpreted as standing in front of the pillars, while in the bottom left corner of the spatula the enclosure walls were thought to be represented.

Notably, there are some problems with this interpretation. The perspective of the depiction is not easily understandable, as inside the real enclosures the central pillars stand side by side, not facing each other. An explanation might be sought in the artist’s intention to display the T-shape of the pillars, which was obviously important to Göbekli Tepe’s builders. Furthermore, one of the visible ‘pillar shafts’ is depicted very slender, curved and narrowing in the lower part. An explanation for this could lie in the abilities of the artist to depict a perspective view, or it was not important to them to show these details in a realistic manner.

On the other hand, it is rather difficult to explain why the pillars, the presumed walls, and the potential human are interconnected by lines. At Göbekli Tepe, animals and humans are normally depicted individually and not interwoven. Pillar 56 in Enclosure H is to some degree a remarkable exception to this rule (Fig. 6a). It presents extensive animal depictions on its southwestern broadside – about 55 animals are rendered here so tightly that the outline of one animal also marks the contour of the other.

Yet there is another important point regarding the mode of depiction on this bone spatula. If we are really confronted with a depiction of the enclosure walls, they would very much look like the modern, excavated state. Today, the walls end below the pillars. Whether this was the prehistoric appearance of the enclosures remains unclear for the moment; there is the possibility to reconstruct the buildings as semi-subterranean and roofed structures (e.g. Kurapkat 2015). In this case, the depictions of very small walls would not make much sense. Another enigmatic motif, the only possible case of depictions of inanimate objects from Göbekli Tepe mentioned above, further complicates the discussion. On the uppermost part of Pillar 43, a row of three rectangular objects with cupola-like ‘arches’ on their tops can be seen (Fig. 6b). Each of these objects is accompanied by an animal added on the ‘arch’. The meaning of these images is hard to fathom, but they might represent the enclosures during their time of use, seen from the side. The rectangular part would represent the perimeter walls, while the cupolas may indicate roofs. As usually depictions of one animal species seem to...
dominate in every enclosure (Becker et al. 2012), it is an intriguing thought that buildings of different groups are depicted here with the emblematic animals of these groups added for recognition. Following this line of argument, one would also have to assume that the enclosures were depicted here rather schematic, i.e. in an almost technical sectional view – this would be highly unusual when compared to the other naturalistic representations from Göbekli Tepe. Be this as it may, a final decision on the meaning of these images is not possible. To conclude, there are a few difficulties with a pre-iconographic interpretation of the image on the spatula as an architectural representation.

Furthermore, there is another way of understanding the depiction. The people who built Göbekli Tepe had a very distinct concept of depicting their world. On reliefs, animals were usually represented in the way humans see them during a real-life confrontation. Snakes, spiders, and centipedes were thus depicted in flat relief and from above; larger animals like wild cats, foxes, gazelle etc. are shown from the side. A very interesting exception from this rule is associated with depictions of cattle. The body of aurochs is depicted in side elevation, the head however is seen from above. The special way of depicting the aurochs’ head could have a distinct meaning. It is possible that the animal is shown with its head lowered for an attack, the sight a hunter sees in the moment the animal charges towards him (Schmidt 2012: 164; Benz and Bauer 2013: 14). Notably, the cattle head is one of the few animal depictions also transformed into a possible ideogram at Göbekli Tepe. Bucrania can be found on several pillars and other elements of architecture (like so-called porthole stones). It is obvious that the mode of representing animals in Neolithic art is far from arbitrary. Starting from here, another interpretation of the spatula appears possible.

Two larger stone slabs from Göbekli Tepe show high reliefs of animals in a crouched position, probably ready to pounce (Figs. 7a-b); another depiction of that type can be found on the front-side of Pillar 6 (Fig. 8). The animals’ limbs lie stretched besides head and body, a long tail is bent to one side. Schmidt (1999: 10-11, nr. A12-13) suggested an interpretation as reptiles, while Helmer, Gourichon and Stordeur (2004: 156-157, Fig. 7) see them as felids, more exactly panthers, and compare them to depictions from Tell Abr´ 3 and Jerf el Ahmar. Meanwhile, two more examples of squatted animals can be added from Göbekli Tepe, one on a fragmented stone slab (Fig. 9a), the other one on the shaft of Pillar 27 in Enclosure C (Fig. 9b). Irrespective of the depicted species, it is important that the special mode of showing certain types of animals is in any case not restricted to Göbekli Tepe, but a characteristic of Early Neolithic art in southwestern Asia in general.
Nevertheless, the image on the spatula does not fit exactly the intra- and offsite analogies presented here. Design and realization appear slightly awkward, which as mentioned above leads to the interpretational uncertainties. We could be dealing with an ad hoc engraving here that only superficially abides to the artistic conventions of displaying animals and at the same time overemphasizes certain aspects of the image. Maybe the artist wanted to emphasize the dangerous parts of the animal, its claws. However, a deeper understanding must fail in this case, as, to get back to the starting point and Panofsky, a clear pre-iconographical description is not possible.

The Object

If the decoration of the find from Gobekli Tepe remains enigmatic, the object itself could be more revealing. The ‘spatula’ is elongated in shape, the preserved end is curved. This feature makes it doubtful that this is the active part of a tool we commonly would describe as spatula (i.e. a tool with a flat blade used to spread or lift substances). The parallel, only slightly converging rims show that the piece was originally much longer. Fortunately, there are some very similar objects from other sites that give additional insight into the original form and possible functions (Appendix 1).

Besides the two aforementioned additional small fragments from Gobekli Tepe, a total of eight comparable finds are known from Körtük Tepe (Özkaya and Coşkun 2011, 2013; Özkaya et al. 2013), and from Hasankeyf Höyük (Miyake 2013). Outside Turkey, two comparable finds come from Nahal Hemar Cave in Israel (Bar-Yosef and Alon 1988). The more complete finds have an elongated leaf-shaped form with a flattened end and flattened to sharp edges all around. The narrow end is perforated, allowing the objects to be fixed to a cord. Of the 13 finds, eight are decorated...
with incised animal motives, one with painted and four with incised geometric motifs. The clear connection of the find group with animal décor could serve as a further argument in favour of an interpretation of the depiction on the Göbekli Tepe find.

The functional interpretation of these ‘bone spatulae’ is rather difficult. The finds outside Göbekli Tepe, and the two fragments found there, have more blade-like ends and could have been used as tools. However, the décor in most cases reaches the presumed active end of the tool and generally seems very elaborate for a simple tool for lifting or spreading materials. The holes in the narrower ends could simply be meant to prevent the loss of a potentially symbolically important object by tying it with a cord. But they could also have played a functional role.

A group of objects with a similar general form well known from archaeological and ethnographical contexts are bullroarers, i.e. musical instruments, usually made of wood, that produce a noise when swung on a long cord (e.g. Seewald 1934; Zerries 1942; Maringer 1982; Morley 2003: 33-37; Fischer 2009). Ethnographic data offers a wide variety of possible uses of bullroarers ranging from cultic ritual to more profane tasks, like scaring away animals from plantations (Morley 2003: 33, with bibliography).

In the archaeological record, bullroarers have been identified since the Palaeolithic. In many cases, however, their function has been open to doubt (Fischer 2009: 3-4). Prominent, sometimes richly decorated items with a likely bullroarer function stem from important French Palaeolithic sites, inter alia from La Roche de Biorl, Dordogne (Magdalenian), Abri de Laugerie Basse (Magdalenian), Lespugue (Solutreen), Badegoule (Morley 2003: 34-35, Fig. 3.1-2). Experimental work by Dauvois (1989) has proven the sound-making capabilities of these pieces. An example of the late Upper Palaeolithic is known from Stellmoor in northern Germany (Ahrensburg Culture: Maringer 1982: 129), and there is a larger list of possible bullroarers from Mesolithic contexts (e.g. Fischer 2009: 12).

To get back to the Near East, PPN use of bullroarers is substantiated by bullroarer type pendants in bone from Çatalhöyük (Russell 2005: 351, Fig. 16.14a). Russell tentatively discusses a function as bullroarers for them, however they are rather small.

It has to be noted though that the PPN pieces from southeastern Turkey are a little different from the usual shape of bullroarers. Some bullroarers have a lancet-shape with two narrowing ends, other examples have a narrow and a broad end, but usually the latter bears the hole for the cord. So some doubt remains regarding the functional interpretation of these objects, though they...
seem to have been of high value for their users, as they appear as grave goods at Körük Tepe. An experimental reproduction of the presumed PPN bullroarers of hard wood serves its function very well and produces a deep vibrato sound (Fig. 10).

Conclusion

The point of the present contribution is not to show that Neolithic art in general is not understandable. But there has to be a basic awareness of the fact that not every depiction is ‘readable’ beyond doubt, and that such depictions naturally should not be used as evidence for far-reaching interpretations. Panofsky’s thoughts can be a powerful instrument in determining the degree of interpretational potential in an image. The detailed comments in this paper are meant to prevent the start of an unfruitful dispute. Without further analogies, an exact understanding of the image on the spatula is not possible. Nevertheless, arguments to see an animal instead of T-shaped pillars cannot be ignored.

Appendix 1: List of elongated bone objects with one perforated end

<table>
<thead>
<tr>
<th>Site</th>
<th>Context</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Göbekli Tepe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>immediately below plough</td>
<td>See above.</td>
</tr>
<tr>
<td>2.</td>
<td>in a deep sounding north of</td>
<td>Terminal fragment, decorated with hatched triangular geometric shapes.</td>
</tr>
<tr>
<td>3.</td>
<td>one terminal perforation at</td>
<td>Axial fragment, decorated with hatched triangular geometric shapes.</td>
</tr>
<tr>
<td>4.</td>
<td>unspecified</td>
<td>Elongated bone plaque, trapezoidal, tapering towards one end. Single terminal perforation at smaller end. Not completely preserved. Carved of geometric forms and lines, interpreted as depiction of a scorpion (Özkaya and Coşkun 2011: 99 Fig. 37 right).</td>
</tr>
<tr>
<td>Hasanköy Höyük</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>funeral</td>
<td>Rectangular bone plaque with rounded corners, lower part not preserved. Carved depiction of two goats in profile on top of each other; outlines and body hatchings by carved lines, eye and centre of body left blank (Özkaya and Coşkun 2011: Fig. 36 left, 2013: 32 top).</td>
</tr>
<tr>
<td>6.</td>
<td>funeral</td>
<td>Elongated bone plaque, not completely preserved. Geometric carvings: multiple wavy lines ending in triangular shape, interpreted as depiction of a snake, accompanied by more geometric but less clearly identifiable designs (Özkaya and Coşkun 2011: 99 Fig. 37 right).</td>
</tr>
<tr>
<td>7.</td>
<td>funeral</td>
<td>Elongated bone plaque, trapezoidal, tapering towards one end. Single terminal perforation at smaller end. Not completely preserved. Carved depiction of a goat and another animal (probably also a goat) in profile on top of each other: outlines and body hatchings by carved lines, eye and centre of body left blank (Özkaya and Coşkun 2011: 99, Fig. 37 centre).</td>
</tr>
<tr>
<td>8.</td>
<td>funeral</td>
<td>Elongated bone plaque, trapezoidal, tapering towards one end. Single terminal perforation at smaller end. Not completely preserved. Carved geometric depiction: concentric circles and a more complex design interpreted as depiction of a spider or an insect, probably a scorpion or centipede, object bears traces of ochre. Özkaya and Coşkun 2011: 99, Fig. 37 (left); Özkaya, Coşkun and Soyukaya 2013: 68 (lower right).</td>
</tr>
<tr>
<td>9.</td>
<td>funeral</td>
<td>Rectangular, elongated bone plaque, lower part not preserved. Decoration in form of repeated diagonal lines, the space between them filled with triangular shapes – creating a more complex pattern. Decoration not carved but painted (lines in red, triangular shapes in black), larger shapes composed by smaller triangular / trapezoid shapes, possibly stamped onto object (Özkaya et al. 2013: 68 centre right).</td>
</tr>
<tr>
<td>10.</td>
<td>funeral</td>
<td>Rectangular, elongated bone plaque with rounded corners, lower part not preserved. Carved decoration in form of geometric designs and lines. Shape in upper part interpreted as scorpion with curled tail, followed by more ovoid motifs without clear interpretation, depiction at lower part may be interpreted as another scorpion due to iconographic similarities. Band consisting of lines, curved lines and concentric rings to the left, apparently repetition of the same complex design. In the centre, between these shapes there are two elongated, pointed forms compiled from carved lines and triangles, with one pointed end towards one side and two towards the other. Interpreted as depiction of insects and catfish (?) (Özkaya et al. 2013: 68 No. 1 upper right).</td>
</tr>
<tr>
<td>11.</td>
<td>funeral</td>
<td>Rectangular, elongated bone plaque, not completely preserved. Carved decoration, curved, wavy lines forming three parallel bands consisting of five rhomboid designs each, filled with hachures, interpreted as depiction of three snakes. Each band finishing in two lines at one end and two smaller curved lines at the other end (Özkaya and Coşkun 2011: 99 Fig. 36 right).</td>
</tr>
<tr>
<td>Nahal Hemar Cave</td>
<td></td>
<td></td>
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<tr>
<td>12.</td>
<td>Dump layer inside cave.</td>
<td>Elongated bone plaque, trapezoidal, tapering towards one end. Single terminal perforation towards smaller end. Simple carved decoration consisting of almost parallel lines running horizontally and slightly downwards from both sides of the bone object towards the centre (Bar-Yosef and Alon 1988: Fig. 12.2, Pl. III2).</td>
</tr>
<tr>
<td>13.</td>
<td>Dump layer inside cave.</td>
<td>Fragment of a flat bone object. Carved decoration consisting of lines running towards each other from both sides diagonally, forming chevron-like designs (Bar-Yosef and Alon 1988: Fig. 13:10).</td>
</tr>
</tbody>
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Introduction

Recent studies provide a coherent picture of a coastal Neolithic dispersal from southwest Asia to the Aegean in the first half of the 7th millennium cal BC using maritime navigation (Perlès 2001; Özdoğan 2011; Çilingiroğlu and Çakırlar 2013; Arbuckle et al. 2014; Horejs et al. 2015). Key sites along the route show that while new permanent sites were founded on inland or coastal plains, at others, where Mesolithic occupations were present forager-farmer interactions resulted in exchange of goods and technologies in the first instance and then replacement or displacement of local foragers (Munro and Stiner 2015). In this contribution, I will focus on a major dispersal event enacted by multiple small groups moving with domestic plants and herd animals transmitting southwest Asian cultural affinities to few selected localities in the Aegean, around 7000-6600 cal BC, thereby drastically altering the somewhat isolated living of well-established and highly mobile Aegean foragers. This short-term but significant dispersal process can be identified at several sites from western Anatolia, Crete and Argolis only, marking the archaeologically most visible earliest neolithization process of the eastern and western Aegean (Fig. 1).

The process manifests itself archaeologically at few known key sites with common features as well as variabilities (Table 1). As emphasised by Kotsakis (2008), the non-homogeneous and complex nature of this dispersal process resulted not only from temporal...
and environmental factors, but also, and perhaps more importantly, from social and cultural variables. Farmer-herder groups new to a given region may have had diverse cultural practices related to ideology and identity resulting in different sets of material culture and architectural features. These groups may have had on-going and intense interaction with local foragers over centuries influencing and altering certain forms of technologies and practices. Adaptation to new environmental settings and resources may also have affected the nature of utilitarian items used by farmer-herders despite heavy reliance on food production. Additionally, as suggested by Munro and Stiner (2015) diverse groups in different times may have used a variety of maritime routes with different sets of challenges to allow or restrict transport of certain items, especially herd animals. This seemingly widespread trend to move and establish permanent sites must have followed yet earlier explorations of these areas made by real pioneers in the late 9th and 8th millennia cal BC as suggested by recent evidence from Girmeler Cave (Takaoğlu et al. 2014). These findings may indicate that the relatively major movement of 7000-6600 cal BC was a consequence of earlier non-massive mobility that explored “new” landscapes and resources fostering contacts with foragers in western Anatolia and the Aegean. In the later and more visible dispersal trend that is the subject matter of this contribution, it seems like farmer-herders either settled at areas that were not optimal for foragers or displaced them. Although the archaeological record is still poor for this kind of discussions and new research may refine the present picture, aDNA evidence suggests that social interaction or exchange of spouses remained at a minimum between farmers and foragers in the 7th-6th millennia cal BC (Hofmanová et al. 2016; Kılınç et al. 2016).

The Aegean and Coastal West Turkey Before 7000 cal BC

The last decade has experienced significant progress in Aegean archaeology in terms of Mesolithic research (Galanidou 2011). Mesolithic sites are excavated in southern Crete (Strasser et al. 2014; Carter 2016), Aegean islands show remarkable remains of forager sites with architecture and burials (Sampson et al. 2012), surveys reveal new find spots on the Cycladic islands (Carter et al. 2014) and on the western coast of Turkey (Çilingiroğlu et al. 2016). As Sampson et al. (2012) suggest Mesolithic architectural features from sites like Maroulas and Kerame 1 may belong to multi-seasonal or even year-round sites of Aegean foragers. While we see permanent sites with food-producing populations in Southwest Asia, in the Aegean we encounter 9th-8th millennia cal BC foragers occupying caves, rock shelters and open-air sites, exploiting certain environmental niches, especially island resources such as migratory and coastal marine fish, hunting wild goat and other mammals, collecting various wild botanical taxa (Trantalidou 2011). Based on the very characteristic, flake-based chipped stone industries, Kozłowski and Kaczanowska (2009; also Sampson et al. 2012) define an “Early Holocene Aegean Islands Tradition” that is distinct both from all the contemporary industries from the eastern Mediterranean as well as from the blade-based industries using pressure-flaking of the western and eastern Aegean during the 7th-6th millennia cal BC. As such, the Aegean Mesolithic, c. 9000-7000 cal BC, displays an idiosyncratic character, with foragers exploiting marine and terrestrial resources both on the mainland and islands, occupying seasonal, multi-seasonal or perhaps even year-round sites.

Despite its name, it is known that this specific lithic production is not confined to the islands. A corresponding trend has already been recognized on the Greek mainland, namely in the Franchthi sequence. Perlès (1999: 315) emphasises the toolkit at Franchthi Lithic Phase VII is formed by what she calls “transformation tools” such as notches, denticulates, endscrapers and laterally retouched pieces. A similar lithic industry was also identified at Sidari on Corfu (Perlès 2001: 34). Therefore, Argolis and western Greece can be included in the Aegean Mesolithic tradition in terms of lithic assemblages. Moreover, a flake-based, non-geometric microlithic industry has been identified at an open-air site during our 2015 survey from Karaburun Peninsula in Izmir. The site POI.15.31 near Mordoğan overlooking the Balıklıova Bay at an altitude of 140 masl produced

<table>
<thead>
<tr>
<th>7000-6600 cal. BC Key Sites</th>
<th>ÖKÜZİNİ</th>
<th>BAĐEMAĞACI</th>
<th>ULUCAK</th>
<th>ÇUKURİÇİ</th>
<th>FRANCHTHI</th>
<th>KNOSSOS</th>
</tr>
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<tbody>
<tr>
<td>FOUR-TIER HUSBANDERY</td>
<td>?</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
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<tr>
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<td>X</td>
<td>-</td>
<td>X</td>
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Table 1  Major archaeological proxies marking the 7000-6600 cal. BC dispersal showing common as well as diverse sets of items.
116 lithics, most of them produced from white patinated flint, with few brown flint and no obsidian present (Fig. 2). With an average length of 27 mm (ranging from 14-70 mm), the assemblage is heavily dominated by unretouched flakes (n=63). Five cores (four flake and one blade) are also identified. Only c. 10% of the assemblage can be identified as specific tool types. Three endscrapers, three notches and six retouched flakes constitute the only pieces that can be identified as tools (Fig. 3). The assemblage contains only three blades (Çilingiroğlu et al. 2016: 5). The preferred raw material from site 31 is identical to the raw material from Kerame 1 on Ikaria (Sampson et al. 2012; personal observation).

The industry from Mordoğan bears therefore close similarities to known Aegean Mesolithic sites in terms of raw material and techno-typology. These findings from the eastern Aegean coast demonstrate that flake-based Mesolithic industries are prevalent on western Anatolian coast. Also, it shows the coastal western Anatolia was culturally part of the greater Aegean with possible mobility between the Anatolian mainland and eastern Aegean islands. It additionally accentuates the idea that blade based industries arrived to the eastern Aegean in the early 7th millennium cal BC as evidence from Çukuriçi suggests (Horejs et al. 2015).

So, where lay the spatial limits of the “Aegean Mesolithic Tradition”? To define the eastern margins of this peculiar and original Aegean Mesolithic technology, it is worth highlighting the contrasting picture from the Antalya area. It is reported that post-10,000 cal BC deposits at Öküzini, for instance, contained large amounts of geometric microliths and that use of geometrics continued well into the final stages of the cave occupation (Otto et al. 1995; Kartal 2009). This shows that Öküzini is strongly connected to the Epipaleolithic/Early PPN traditions of eastern Mediterranean even in the Early Holocene which makes sense especially when one considers the Natufian-type lithics and material culture from the earlier phase III (Otto et al. 1995). The contrast with the Early Holocene Aegean is so clear that one can suggest that the southern Turkish coast lies outside of the Aegean interaction zone. So instead of a connected Aegean, we can actually suggest vibrant forager communities interacting within a rather closed Aegean network as suggested by its locally developed and maintained chipped stone industry. This idiosyncratic character of the Aegean Mesolithic is an indication of its local development and its isolated nature compared to sites outside the Aegean (Kozlowski and Kaczanowska 2009: 362).

The only evidence that complicates the picture from the Aegean comes from a newly investigated site from southwest Turkey, namely Girmeler Cave near Fethiye. Late 9th millennium deposits (8200-7900 cal BC) at the site revealed a plastered floor, post-holes with remains of a wattle-and-daub superstructure (Takaoğlu et al. 2014). Besides circular hearths, pits as well as a large collection of grinding instruments like querns at Girmeler Cave present a good candidate for evidence of sedentary living. Takaoğlu et al. (2014) suggest that these may be remnants of a permanent residence of foragers who reportedly hunted wild boar, red deer, fallow deer and hare. It is known that the earliest sedentary villages appeared in SW Asia already in the 11th-10th millennia cal BC (if not earlier; see Maher et al. 2012), on Cyprus around 9500 cal BC, in Central Anatolia around 8500 cal BC (Baird et al. 2012). Multiple seasonal sites appeared in Antalya.
Çilingiroğlu, A Dispersal Event

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region as early as 12,000 cal BC (Atıcı and Stutz 2002; Martinoli 2004). Therefore, it is possible that late 9th millennium cal BC site at Girmeler may be a year-round forager site. Takaöglu et al. (2014) report that late 8th millennium cal BC deposits at the site revealed multiple plaster floors with 12 cm thickness; much in the tradition of Cappadocian site of Aşıklı with plaster floors that are as thick as 6-8 cm (Hauptmann and Yalçın 2000: 62).

The lithics from the 9th millennium site Girmeler are said to be of flake based with rare retouched specimens produced on local raw materials. Although the issue of sedentism needs to be addressed with proper seasonality research, this constitutes the earliest mud-based architecture in southwest Turkey that may reflect architectural know-how attested from early PPN sites of the Konya Plain and Cappadocia (Takaöglu et al. 2014). The building materials and employed techniques at Girmeler Cave can be juxtaposed with the stone-based features (stone lined and stone paved remains) excavated at Maroulas and Kerame 1 in the Aegean islands. A detailed analysis of chipped stones from the site may shed light whether the industry is more related to Aegean Mesolithic, eastern Mediterranean traditions or a mixture of the two.

### A Dispersal Event: 7000-6600 cal BC

The subsistence economy and material culture of early 7th millennium cal BC Aegean farmer-herders is easily distinguished from Early Holocene Aegean tradition. Current archaeological data suggests that basal deposits at Bademağacı, Ulucak and Çukurçi are sites that were first established following a major dispersal event around 7000-6600 cal BC as these sites show strong parallels in terms of their faunal-floral remains as well as material culture and architectural features (Çilingiroğlu et al. 2012; Duru 2012; Horejs et al. 2015). As it will be argued below, a corresponding trend that shares many similarities with the west Anatolian sites in terms of faunal-floral remains, architectural tradition and material culture can be recognized at the Initial Neolithic sites in Greece: namely, the Franchthi Cave and basal Knossos (Efstratiou et al. 2013; Perlès et al. 2013). In my opinion, these commonalities arise from culture specific choices and practices that share a common historical and societal background as suggested by Perlès (2001), Özdogan (2008) and more recently by Broodbank (2013). Many of the elements and technologies identified at these sites find their closest parallels not in the local Mesolithic ‘cultures’ but in the southwest Asian Neolithic. Radiocarbon evidence is not crystal clear but a time period of several centuries seems probable for this specific dispersal process (Table 2). This time period must have allowed for mobility in all directions and variability of interactions among farmer-farmers and forager-farmers. One thing is certain though. The Aegean Mesolithic that flourished in the 9th and 8th millennia cal BC in a rather closed Aegean network came to an end with 7000 cal BC marking the beginning of a new prehistorical era with new incomers. As suggested by radiocarbon data, one of the striking aspects of this process is its rapidity when compared to Neolithic dispersals in inland Anatolia (Schoop 2005; Brami 2015). The rather rapid process of dispersal in the early 7th millennium BC was enabled

<table>
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<tr>
<th>Site Name</th>
<th>Stratum</th>
<th>Lab-Nr</th>
<th>Conventional RC Age</th>
<th>1 sigma calibration</th>
<th>Material</th>
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Table 2 A list of radiocarbon dates from key sites mentioned in the study.
by a coastal mobility using long established sea routes, possibly improved forms of navigational know-how and maritime technology (Broodbank 2013: 188). The seafaring knowledge of communities who were familiar with eastern Mediterranean waters at least since the Epipaleolithic period – as typically known from Cypriot evidence – facilitated the rather speedy movement of people along with their heavy and alive cargo such as domestic cattle, pigs, sheep and goats; not to mention loads of domestic cereals and pulses. This movement penetrated inland areas using well-known mountain passes and valleys targeting mainly rich alluvial plains with access to freshwater (mainly lacustrine but also perennial) and woodland environments (Çilingiröglu and Çakırlar 2013; Arbuckle et al. 2014; Horejs et al. 2015). Although the archaeological evidence is still patchy, a general dispersal pattern using multiple routes and diverse engagements with local foragers can be inferred. Further evidence for population dispersal comes from aDNA evidence. Farmer-herder sites of the early 7th millennium cal BC were arguably occupied by groups with close genetic affinities as indicated by recent aDNA studies which demonstrate that early farmer-herders of Central Anatolia, western Anatolia, Greece and even Central Europe and western Mediterranean cluster together forming a homogeneous group who shared common ancestors somewhere in eastern Mediterranean but did not or minimally mixed with local foragers (Hofmanová et al. 2016; Kılınç et al. 2016).

Below I will try to outline the general characteristics of this dispersal event as incorporated by archaeological evidence.

First of all, the presence of all four domestic herd animals (sheep, goat, pig and cattle) is a strong link between these sites indicating common herd compositions and husbandry strategies (Isaakidou 2008; De Cupere et al. 2008; Çakırlar 2012; Horejs et al. 2015; Munro and Stiner 2015). Four-tier economy identified at these sites is not a feature of Central and Northwest Anatolian Initial Neolithic sites. It is well-known that domestic cattle and pigs are absent in Central Anatolia and domestic pigs are absent in the earliest northwest Anatolian sites (Arbuckle 2013). Therefore, four-tier husbandry practice which requires encyclopaedic knowledge (Munro and Stiner 2015) can be described as a culturally and historically determined choice that is peculiar to both southwest Asian and Aegean Early Neolithic groups to the exclusion of Central and Northwest Anatolian groups. The recognition of this pattern led zooarchaeologists (Arbuckle et al. 2014) to infer a human-mediated mobility of herd animals by way of coastal navigation which is the most probable scenario especially when one considers the well-established colonization cases of Cyprus and Crete (Broodbank and Strasser 1999; Vigne et al. 2012).

There are other commonalities among these sites. One of the most interesting attributes of these sites is the lack of diversity and abundance in the material culture (Evans 1971: 115; Çilingiröglu et al. 2012; Duru 2012; Horejs et al. 2015). The typical items of the Southwest Asian and Anatolian Neolithic such as the clay stamps, figurines, spindle whorls or biconical slings are scarcely found in this early horizon. The material culture is composed of few utilitarian items, mainly bone tools, grinding instruments and chipped stones. Rarities like well-made stone bracelets (such as the ones from Çukuriç; Horejs et al. 2015: 303; and Knossos IX; Ünlüsoy 2002) and pierced circular beads (such as the ones from Çukuriç and Ulucak; Horejs et al. 2015: 303-304; Çilingiröglu et al. 2012) constitute the only portable symbolic items. Total lack of or minute amounts of clay containers at these sites are but one indication of their common technological level and attitude towards food preparation and storage practices. All the early 7th millennium cal BC sites suffer from the Aceramic/Ceramic Neolithic discussion which actually indicates that clay containers and the associated technology was perhaps known but was not integrated into the daily lives which left sporadic finds of pottery (Perlès 2001: Chapter 5). All these items appear variably at these sites, however overall this set of objects composes a material culture that is vaguely related to Aegean forager material cultures which is, apart from the flake-based chipped stones, dominated by bone pointed instruments, bipoints, hooks, few polished objects and ad-hoc bone tools (Perlès 1999: 34; Galamidou 2011; Moundrea-Agrafioti 2011).

The architecture of 7000-6600 cal BC sites can be contrasted with the known Aegean Mesolithic architectural features. Mainly, Initial Neolithic sites show construction of rectilinear dwellings, use of mud, mudbrick, timber for superstructure and occasionally stones as foundations. At west Anatolian sites beside the use of rectilinear mud-based architecture, one observes the widespread construction of lime plastered floors. Basal Bademağacı, the so-called “Aceramic Haçlar”, Ulucak VI and Çukuriç XIII all contain well-preserved remains of red plaster floors which are in most cases renewed several times (Mellaart 1970; Çilingiröglu et al. 2012; Duru 2012; Horejs et al. 2015: 297). Painted plaster floors at these early 7th millennium cal BC sites may be important in terms of origins of farming groups as this practice which incorporates use of large amounts of lime, pyrotechnology and red paint are a well-defined characteristic of PPNB-C sites in southwest Asia and PPN sites in Central Anatolia (Garfinkel 1987; Özbaşaran 2012). The symbolic substance of these can be inferred from the labour intensive production stages on the one hand and the persistent use of colour symbolism on the other; however it would be premature to suggest that buildings with red plastered floors entailed solely ritual purposes (Çilingiröglu 2011). Their widespread occurrence in southwest Asia, including Central, southwest and western Anatolia is in my opinion yet another culture specific practice that is unrelated to forager practices in those areas. In the context of west Anatolia their appearance can be linked to the 7000-6600 cal BC dispersal event as this practice is absent at post-6500 cal BC sites.

Interestingly, red plaster floors are not known from Greek Initial Neolithic (IN) sites. Remains of such features are known neither from Mesolithic nor Initial/Early Neolithic deposits at Franchthi Cave or basal Knossos
Use of pressure flaking and blade-based chipped stone industries is another significant index of 7000-6600 cal BC farming groups which contrasts with the known Aegean Mesolithic industries. Because chipped stones constitute a major material cultural item common to both periods, their techno-typological comparisons would yield the most reliable information on the nature of forager-farmer encounters. Here emerges the possibility of peaceful interactions (such as gift giving, exchange of spouses, exchange of goods/foods etc.) that may have resulted in an influence of forager toolkit on incoming farmer-herders or adaptation of Neolithic features by local foragers. This idea seems to be supported by the chipped stones both at Knossos X and Franchthi Cave IN deposits because they are characterized by flake-based chipped stones of Mesolithic character together with blades (Perlès 2001: 47; Kozlowski and Kaczanowska 2009: 375). However, new evidence from Franchthi Cave also opens up a path for new interpretations. Earlier understanding of Franchthi Cave (Perlès 1999: 317; 2001: 48) data presented a case for interaction and exchange of goods upon early contacts with the farmer-herders. Perlès (1999: 317) indicates that first encounters during the Initial Neolithic caused foragers to adapt some domesticated species like wheat, lentils and ovicaprids with local chipped stone industry maintaining its Mesolithic (i.e. flake-based) character. In the second instance, i.e. during the Early Neolithic, however, no forager component can be identified in the archaeological strata. These disappeared completely, possibly following a brief abandonment of the site when a fully developed Neolithic subsistence and material culture is recognised at the site, both in the cave and in Paralia (Perlès 1999: 317). However, new dates from Franchthi Cave establishes a hiatus of 200 years between the Final Mesolithic and IN periods (Perlès et al. 2013: 1011) which speaks against uninterrupted encounters of farmers and foragers or a smooth adaptation of farmer-herder practices by local foragers. More importantly, new zooarchaeological investigation from the site establishes that there is no piecemeal transition from forager to farmer-herder subsistence at the site. Instead, the broad spectrum diet of Final Mesolithic groups heavily dominated by red deer (Cervus elaphus) was suddenly replaced by a fully-developed package of domesticates including all four herd animals with a clear focus on domestic sheep which is a non-native animal (Munro and Stiner 2015: 597-601). Munro and Stiner (2015: 601) suggest that the low numbers of cattle and pigs at IN Franchthi Cave may be linked to difficulties of their maritime transport. A similar contrasting pattern can be observed in the plant taxa from the cave’s Final Mesolithic and Initial Neolithic levels, with two-row barley and emmer wheat suddenly appearing along with the locally collected wild plants (Munro and Stiner 2015: 600). New evidence suggests an abrupt introduction of farmer-herder components in the Argolid but how to accommodate the continuing Mesolithic character of the chipped stones remains an issue to be further addressed.

Forager-farmer interactions may have been in place at Öküzini, a cave site in Antalya with forager occupations since 18,000 BP. Two AMS dates on domestic seeds opens a previously unnoticed possibility of farmer-herder presence at the cave or in the area around 7000-6600 cal BC. It is striking to see that two domesticated seeds of Lens and Triticum monococcum provided AMS results of 7060-6690 cal BC and 7090-6700 cal BC (Martinoli 2004: Table 3). These dates correspond to the emergence of fully-sedentary and food producing villages in Southwest and West Turkey and may signify a similar event at Öküzini. The fact that geometric microliths (lunate, triangles, backed bladelets, trapezes) continue to be produced after 10,000 cal BC at Öküzini may indicate that Antalya foragers adapted some of the components of the farmer-herder living upon early encounters. If strong continuity of Epipaleolithic industries at Öküzini’s Phase 4 can be taken at face value, then a piecemeal adaptation or at least mutual exchanges with arriving farmer-herders seem probable. Presence of polished axes in the same phase further lends probability to the notion of farmer-forager interaction (Broodbank 2013: 175). Alternatively, a scenario similar to Franchthi Cave may have been in play. Unfortunately, the final phase at Öküzini contains mixed deposits (Kartal 2009: 150) which impedes further investigation of the nature of forager-farmer contacts in this area. Nevertheless, the fact that sites like Bademağaç, which can be reached via a mountain pass from Mediterranean littoral, was established by farmer-herders around 7000-6600 cal BC indicate that the area received newcomers around this time (Duru 2012) and that domestic seeds from Öküzini can be historically contextualized within the 7000-6660 cal BC dispersal event. Öküzini-Bademağaç connection shows
also that maritime dispersal was at times accompanied by inland penetrations.

As already mentioned for west Anatolian sites, it is early to discuss forager-farmer interactions based on firm archaeological evidence. From western Anatolian sites, there is yet no compelling lithic evidence to suggest a similar interaction phase. A recent report stated that basal Ulucak incorporates flake based chipped stones co-occurring with blades and bladelets (Çevik and Abay 2016: 190). Also, one lunate from basal Çukuriçi (Horejs et al. 2015: Fig. 7a) can be tentatively highlighted as a possible local forager component in the otherwise typically blade-based industry. Horejs et al. (2015) relate this item to Neolithic technologies of southwest Asia where it finds good parallels, but local forager option may likewise be considered here based on the evidence from Ulucak VI and IN sites from Greece.

**Discussion**

Since Central Anatolian Neolithic sites are distinguished from the Aegean sites in terms of herd composition (specifically by the absence of domestic pig and cattle), researchers working in Turkey and elsewhere developed a model of a maritime dispersal that operated more or less independently from the inland dispersal and interaction zones in the eastern Mediterranean, reaching western Turkey, Argolis and Crete as shown by radiocarbon data pointing towards the first half of the 7th millennium cal BC (Çilingiroğlu and Çakırlar 2013; Arbuckle et al. 2014; Horejs et al. 2015). Brami’s work (2015: Fig. 5) on radiocarbon data from Neolithic sites reveals that Greek and western Anatolian sites mirror similar trends – same peaks and troughs – in terms of chronological distributions with a marked increasing trend beginning in the early 7th millennium cal BC, implying that farmer-holders founded permanent sites in western Anatolia, Crete and Argolis around the same time.

This contribution aimed to evaluate and discuss the archaeological evidence from Bademağacı, Ulucak, Çukuriçi, Knossos and Franchthi Cave as key sites with deposits from this temporal horizon. My aim was to demonstrate that establishment of these sites can be understood as manifestations of a demographic movement process from southwest Asia to different areas of the Aegean. Zooarchaeological, archaeobotanical, archaeological, architectural and finally aDNA evidence is in favour of such a dispersal process and presents us a non-homogenous, complex course of events with multiple variables causing the diverse appearances of archaeological evidence (Fig. 1; Table 1).

I also tried to support this interpretation by contrasting the material culture from the Aegean Mesolithic with the evidence from early 7th millennium cal BC sites. There is little correspondence between Aegean Mesolithic and IN assemblages. The continuity of Mesolithic or Epipaleolithic lithic traditions at cave sites and at Knossos may indicate well-functioning forager-farmer interactions and exchanges of goods upon early encounters. But as discussed above, the evidence from Franchthi Cave and Öküzini Cave do allow for multiple interpretations. This is virtually the most challenging aspect of the neolithization research in this area which still needs to be clarified.

At key sites of the early 7th millennium cal BC, sheep, goat, cattle and pig are morphologically domestic with clear genetic links to Southwest Asian species (Scheu et al. 2012; except for pig; see Ottoni et al. 2013). Four-tier economy requires vast knowledge on each of these species behaviour, management techniques and their reproduction cycles etc. We know that all these species were first domesticated in southwest Asia around 8000 cal BC (Zeder 2008). All of them together appear in West Anatolia (both Lake District and coastal West Anatolia) and at Greek IN sites (Knossos and Franchthi Cave) around 6800-6700 cal BC. All four domesticates are also present at Yumuktepe, a coastal site in eastern Turkey, around 6700 cal BC; further underscoring the option of maritime dispersal (Arbuckle et al. 2014). Archaeobotanical work is still under progress and is not as clear as the faunal evidence. The sites dating between 7000-6600 cal BC incorporate evidence of cultivation of einkorn wheat, emmer wheat, durum wheat, barley, free-threshing wheat and lentil; some of these species being non-native to the Aegean (Çilingiroğlu et al. 2012; Horejs 2012; Perlès et al. 2013). Archaeological evidence substantiates this view with presence of southwest Asian traits at these sites such as pressure flaking technique that is absent in Central Anatolia until 6500 BC, also traits like rectangular mud-based architecture, red plastered floors, elaborately made stone bracelets and shaft straighteners (Çilingiroğlu and Çakırlar 2013; Horejs et al. 2015; Munro and Stiner 2015). The absence of red plaster floors at Greek Initial and Early Neolithic may hold a differentiated cultural significance and does highlight the level of social variability during and after this dispersal process.

Using a long-existing, pre-Neolithic maritime route, farmer-holders' groups moved over long distances, implementing ‘slow-motion seafaring’ to use a term from Braudel, that intensely and constantly operated along the coastal lines within short distances and sporadically used for long-distance engagements in all directions (Çilingiroğlu 2016). An unorganized, spontaneous and constant movement of people along with plants, animals, finished goods and raw materials co-existed with infrequent yet planned long-distance mobility that aimed at exploring new lands and resources upon which new villages are established at some optimal localities. This movement was not limited to coastal areas but at times penetrated inland areas using natural mountain passes as with the case of Bademağacı and Ulucak. Before this movement, a ‘colonization’ phase requiring careful planning and organization (as described by Broodbank and Strasser 1991), an exploration phase epitomized by manifold forager-farmer interactions must have been present which pre-dates 7000 cal BC.

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The 10th International Congress on the Archaeology of the Ancient Near East (ICAANE) was held in Vienna, Austria from 25th to 29th, April, 2016. Eight sections and 27 workshops were organized in the Institute for Oriental and European Archaeology which belongs to the Austrian Academy of Sciences and gathered many archaeologists and specialists from numerous nationalities.

In the last two days of the conference, from 28th to 29th, April, Jörg Becker, Bernd Müller-Neuhof from the Deutsches Archäologisches Institut, Orient-Abteilung in Berlin and Claudia Beuger from the Martin-Luther-Universität Halle-Wittenberg, Seminar für Orientalische Archäologie und Kunstgeschichte in Halle organized a Workshop entitled “Iconography and Symbolic Meaning of the Human in Near Eastern Prehistory”. The workshop aimed to highlight new field research on the human representation in ancient Near Eastern prehistory, attempting to provide further and new interpretation on issues like “fertility cult”, “god representation”, etc.

16 participants from 9 countries took part in the two-days workshop; 19 lectures were presented in English in three sections: 1 “Symbolism and Iconography”, 2 “Physical Anthropology and Mortuary Practises”, and 3 “Self-perception and Self-expression of the Human Being”. Both days of the workshop were attended by a large audience.

The first section, “Symbolism and Iconography” included five lectures (T. Watkins’ only read) was devoted to human representations (figurines, paintings, engraving or reliefs on ceramics) from the Natufian period throughout the Early Chalcolithic. The lectures discussed the diversity of the human representations in a diachronic and a regional way, and the difficulties of interpreting these objects often found in secondary contexts. Another issue of discussion was that human representations were often found intentionally broken, as in Göbekli Tepe where human stone heads were found buried at the foot of the pillars. Lectures also tried to question the possible use of this human representation for domestic ceremonies or activities.

The second part, “Physical anthropology and mortuary practises”, presented a lot of lectures on human remains from the sites of Basta, Lidar Höyük, Uyyun el-Hamman, ‘Ayn Qasiyya, Boncuklu, Wadi Faynan 16, Körtik Tepe and Jericho, among others. In this part, authors talked about the treatment of the dead which differs by time and region. Indeed, some of the dead are buried under the floor of the houses while others are buried in a dedicated “cemetery”, as in Uyyun el-Hamman in Jordan. As far as that goes, in Boncuklu, Turkey, some of the dead were buried under the houses and some of the others were buried in external spaces, even in the garbage. Isotopic study showed that the
two populations came from different locations, and that there is a selection of the dead according to their origin. This result drove several authors to question the possible differences of the status of individuals. The question of the adornment and grave goods was also raised, because it is often difficult to distinguish between real grave goods and what D. Baird called “background noise” (objects present in the sediment but not necessarily associated with the burial/dead). The post-depositional treatment of the human remains was particularly treated in the lecture by Yilmaz Erdal on the human remains from Körtik Tepe. These bones show a lot of intentional cut marks, painting with ochre or black pigment and covered with plaster. These treatments indicate either interpersonal violence or special burial rituals.

Finally, the third part of the workshop, “Self-perception and Self-expression of the Human Being”, attempted to question the nature of the human representations, and how the human perceives his “beyond”. The figurines, sometimes painted or engraved (representing either clothes or tattoos), show us how the human understood her- or himself. Plastered skulls which seem to have been repaired several times suggest a specific use of these representations, maybe for a longer period. B. Müller-Neuhof proposed for figurines in South-Western Asia an apotropaic use as a magical substitute for pregnancy and delivery. And finally, the question of the link between human representation and mortuary practices was raised for the site of Dja’de el-Mughara, where nearly all of the dead for the last phase were buried in a specific building, a “house of the dead”.

Of course, the workshop could only approach and not answer all of these questions, but it succeeded in providing new interpretation lines and questions for the various meanings of human representation in the Near East. Exchanges between the lecturers were extremely interesting, as was the exchange with the audience, indicating the high quality of communications and related debates.

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Unlike the 1960-70s during which spectacular excavations took place across Iran the succeeding stagnation in research brought the country out of the focus of Near Eastern Neolithic research.

However, important research progress was made again in recent years, and new interdisciplinary approaches enriched previous information. New evidence on Neolithic Iran is flourishing, and results request more excavated data in future. In 2010, a workshop on the Iranian Neolithic was organized by Roger Matthews and Hassan Fazeli Nashli during the the 7th ICAANE in the British Museum in London, published in 2013 (Matthews and Fazeli 2013); it was followed by another overview on the Iranian Neolithic by Roustaeei and Mashkour (2016). The international conference Neolithisation and its Consequences: A Global View (from and to Iran) held at the University of Tehran, is the most recent enterprise for an overview, concentrating on a wider geographical perspective on the diversity of Neolithisation in Iran. The discussion involved areas as far as Europe and the Pontic region though Iran’s important role in the Neolithisation processes became clear enough. During two days, 20 papers were presented at the Bastani Parizi Hall, Faculty of Literature and Humanities, University of Tehran (Figs. 1 and 2). The topics were ordered according to two major public sessions: Evidences of Neolithisation in Iran (1st day) and Global Neolithisation Processes in Adjacent Near East and Europe (2nd day). Two more days were devoted to visits of Neolithic sites on the Tehran and Keshan plains..

Four brief lectures presented by Hassan Fazeli Nashli and Judith Thomalsky (the conference organizers), Hamideh Choubak (Head of the Iranian Center for Archaeological Research/ICAR), and Hoseinali Ghobadi (Head of the Research Center for Humanities and Cultural Studies of Iran) opened and introduced the conference.

An impressing, impulse-giving paper (‘Worldwide Research Perspectives for the Shift of Human Societies from Mobile to Settled Ways of Life’) was presented by Roger Matthews (University of Reading). He discussed basic issues such as the worldwide heartlands of domestication and agricultural dispersals and emphasized on the importance of the major driving factors, the ‘Hows’ and ‘Whys’ of Neolithisation. He presented an overview on the theoretical backgrounds, such as the Oasis-and-Hilly-Flanks model and on the new evi-
dence from aDNA research and other methods. In this respect, and to address the dispersal of Neolithic life modes, for instance, it is believed that male farmers might have migrated from the Near East to Europe and 'married' local women. A strong attention should now be given to palaeoclimatology as an important area of research. All in all, he emphasized that Neolithisation was a long-lasting while very heterogenic set of processes, and not a single event, both to in the global and the niche perspectives.

The Iranian session was started by Hamed Vahdati Nasab (Tartbiat Modares University, Tehran) who talked about ‘The Transition from Paleolithic to the Neolithic on the Central Plateau’. After his outline of a methodological-theoretical framework, Vahdati Nasab presented the Paleolithic occupation in the region and concluded that at the end of the Paleolithic development the Neolithic substratum was provided by a climatic optimum. This horizon, the Epipaleolithic, must be understood as the period of adaptation to the environments both in terms of subsistence and technology. But the archaeological record still exhibits a major problem: Although the Central Plateau of Iran hosted some Epipaleolithic occupations, no site with Early Neolithic remains has yet been discovered. Cave-sites such as Komishan showed no evidence of domestication, while the earliest fully domestic species come from Sang-e Chakhmagh West. Although aDNA analyses indicate a sort of spreading Neolithic lifestyles into the region, ‘cultural adaptability’ seems to have played a major role in this regard.

Hojjat Darabi (Razi University, Kermanshah) gave a summary in his talk ‘The Earliest Steps towards the Neolithic World in Western Iran’ on the very earliest evidences of Neolithic processes in Iran. By the end of the Younger Dryas, temperature and precipitation increased in Western Iran and, therefore, plants and trees increasingly grew in this area. This basically provided longer occupations at one spot which became one major factor for population increase. While environmental resources were intensively exploited and came under pressure by the people, some species such as emmer, barley, lentil and goats were regularly grown in some communities. This discussion is mostly based on the recent evidence from Chogha Golan, Chia Sabz East, and Sheikh-e Abad. However, it is believed that not only subsistence changed from foraging to farming during the ‘Transitional Neolithic’ (c. 9,500-8,000 BC), but also technologies/ innovations such as the emergence of grinding stones or the ‘Pre-M’lefatian chipped stone industry’ simultaneously became dominant. This could indicate that western Iran was a Neolithisation center of its own right.

‘North-eastern Iran During the Neolithic’ was discussed by Omran Garazhian (University of Neishapur). He applied the term ‘Jeitun - Sang-e Chakhmagh Culture’ and described the sites in terms of pottery and architecture, with an emphasis on Qaleh Khan and Tale-e Atashi. It is understood that both insufficient fieldwork and geomorphological factors – such as erosion and unstable sandy landscape – are responsible for the little knowledge we have on the Neolithic occupations in eastern Iran.

Roger Matthews spoke of ‘The Neolithisation of the Eastern Fertile Crescent: New Evidence from the Zagros’, and stressed the contextual and social approaches in investigating the Neolithisation processes, and – tackling his recent excavations in Iranian Zagros and Iraqi Kurdistan – aimed at an examination of the role of local ecosystems in domestication in a way that goats initially became domestic in the Zagros Highlands, spreading from here to lower lands such as northern Iraq and southwestern Iran.

Abbas Alizadaeh (Oriental Institute, University of Chicago) gave an all-out talk by using the conference title ‘Neolithisation and its Consequences in Early Neolithic times: a Global Perspective (from and to Iran)’. He emphasized the territoriality in the Neolithic period and that social change is poorly documented in Iranian Neolithic. After a brief discussion on the Paleolithic and Epipaleolithic period in the Central Plateau, he focused on the Neolithic sites in lowland Khuzestan, southwestern Iran. Noteworthy is the heavy sedimentation of the region that makes the detection of Neolithic sites almost impossible. Alizadaeh believes that regional communication networks were formed from the early 6th millennium cal BC onwards, and that earlier settlements should be considered with regard to ‘territoriality’.

The “Southern Zagros During the Neolithic Period” was discussed by Hossein Azizi Kharanaghi (Iranian Cultural Heritage and Tourism Organisation) who highlighted the different landscapes and the research history of the region. The presentation mainly focused on the regional chronology by which some sites were discussed. In this regard, the Proto-Neolithic/ Tang-e Bolaghi Phase (c. 10,000-7,400 cal BC),
the Pre-pottery Neolithic/ Rahmatabad Phase (c. 7,400-7,000 cal BC), and the Pottery Neolithic Phase (c. 7,000-5,200 cal BC) were distinguished. Based on ceramic styles, the Pottery Neolithic was divided into three sub-phases: Early/ Formative Mushki (c. 7,000-6,350 BC), Middle/ Mushki (c. 6,350-6,000 cal BC), and Late/ Jari- Bashi-Shamsabad (c. 6,000-5,200 cal BC). In particular, excavations at Tapeh Rahmatabad and Qasr-e Ahmad shed new light on the Neolithisation of southern Iran. At Rahmatabad, the chipped stone industry indicates a M’lefatian tradition. Furthermore, a change from hunting/gathering to farming is attributed to the site. In general, the Neolithic might have rooted in the Central Zagros, spreading from here to southern Iran by the diffusion of new ideas.

The Northern Central Plateau of Iran was discussed by Hassan Fazeli Nashli (University of Tehran). His presentation entitled “Caspian Sea and Central Iranian Plateau: Data in Comparison” mostly concentrated on new evidence provided by some Neolithic sites on the Tehran, Kashan and Qazvin Plains. The sites such as Sialk North, Pardis, Chahar Boneh, and Ebrahimabad were debated in the light of their dates, architecture, pottery, burial and botanical/ zoological remains. Cremation was identified at Sialk North. The sites have been re-occupied during post-Neolithic times, usually covered by later deposits. It is stated that the lack of PPN settlements seems to result from deep sedimentation of the plains.

‘Neolithic Data from Northwestern Iran’ was presented by Bahram Ajourloo (Tabriz Islamic Art University). Ajourloo’s discussion concentrated on the role of a ‘climatic playa stage’ prior to c. 7,000 cal BC, and that the region was environmentally uninhabitable until the late 7th millennium cal BC when settlements such as Ahranjan and Qreh Tapeh were established. It was stated that the earliest Neolithic settlements in northwestern Iran emerged as a result of migration from the Central Zagros. However, petrographic analysis proved the local origin of the Neolithic pottery. Like the Central Plateau, northwestern Iran suffers from the lack of PPN sites.

Genetic analysis and its role in better understanding the Neolithisation was pointed out by Javad Hossein-zadeh (Kashan University). His lecture ‘Neolithic of Iran and the Contribution of Archaeogenetics’ began with a general discussion on new excavations in the Central Zagros, a chronological debate, and the topic of previous genetic analysis on goats. The rest of the presentation concentrated on recent analyses done on samples taken from three Neolithic sites (Chahar Boneh, Sialk North, and Ebrahimabad) on the Northern Central Plateau. The results showed that the goat samples attribute to southeastern Turkey, possibly meaning that domestic goats were brought from there to the Central Iranian Plateau and from here to southeastern Iran. However, this idea requires further data.

By the end of the first day, as the session on Iran finished, Judith Thomalsky summarized the presentations and emphasized on the importance of current data and on the issues still needing future discussion. In the evening, contributors paid a visit to the Iranology Foundation where the Museum of Iranian Ethnology and a picture-gallery attracted them.

During the second day, Neolithisation was approached from broader geographical contexts, including Syria, Turkey, Jordan and Europe. In addition, as illustrated by the following report, palaeoclimatology was more a subject.

Giving attention to a large region, Dominik Fleitman (University of Reading, UK) presented ‘The Context of Neolithisation: Paleo-climates of Iran and the Middle East during the Late Pleistocene and Early Holocene’. He started with a brief look at present climate of the Middle East, understanding that it is mostly influenced by mid-latitude subtropical high pressure systems, and, in this respect, Iran is located between the northern Atlantic and southern monsoon climate systems. Based on available information provided by various methods and sources, such as lake-bed palynology, carbon isotope and cave stalagmite analyses, the transition from late Epipaleolithic to early Neolithic was illustrated by climate data. Based on some evidence from Turkey and the Mediterranean, the two dry cold climatic events (9.2 and 8.2 Kya) during the early Holocene were discussed; it was argued that these should be taken into account by Iranian archaeology in future. For this, continuous records and precise chronologies are the main requirements for meaningful future research.

Fig. 3 The organizers present the conclusions and achievements of the conference. (photo courtesy of H. Fazeli)
Micro-morphological analysis was the central theme of the lecture given by Wendy Matthews (University of Reading) on the ‘Early Built Environments and Settled life in the Neolithic of the Central Zagros’. She discussed the change from seasonality to year-round occupations in the early Neolithic Zagros through her analyses of samples taken in Sheikh-e Abad and Jani in western Iran and Bestansur and Shimshara in northern Iraq. In this regard, different functional loci inside the houses were identified.

The discussion then led to the north of the Black Sea or the Pontic region by Norbert Benecke (DAI Berlin) who presented ‘Archaeozoological Studies on the Mesolithic - Neolithic Transition in the Pontic Region’. He reminded on some characteristics related to animal domestication, and went into the region by means of zooarchaeology. Showing zoological investigations at some Neolithic sites, it is concluded that the principal animal species (goats, sheep, cattle and pig) were not domesticated locally, and that fully-domestic animals spread from c. 6,500 cal BC.

Karin Bartl (DAI, Damascus Branch) explained ‘Neolithic Developments in Syria’. At first, the Syrian landscape and research backgrounds were discussed. The chronological debate and the archaeological indicators of each Neolithic (sub-) period were discussed by the presentation of key sites such as Abu Hurayra, Jerf-al Ahmar, ‘Abr, lower Qaramel, Halula, Ramad, and Abyad. Then, the earliest Neolithic pottery was presented, from sites like Bouqras. Lastly, the place of the Halaf culture within Late Syrian Neolithic was reviewed. It was stated that, based on the archaeological evidence, the numbers of settlements increased by the Pottery Neolithic.

Mehmet Özdoğan (University of Istanbul) presented ‘The Neolithic Cultures in Turkey’. The lecture began with the idea that no suitable sites with late Epipaleolithic to early Neolithic deposits have yet been found in Turkey; however, recent investigations showed occupations dating back to the 10th millennium cal BC onwards. The transition from round to rectilinear near houses and the residential and special buildings in Neolithic Turkey were subject. In this regard, sites with T-shaped pillars (e.g. Göbekli Tepe) could show a sort of divinization of the nature on the pillars. Different burial practices, craft specialization, supra-regional interaction, and various subsistence strategies in PPN were addressed. In addition, a new way of social complexity established in the Pottery Neolithic when migrations caused the spreads of Neolithic life modes into Europe; this time coming with the emergence of new Neolithic cores in Turkey.

The following contribution, ‘Göbekli Tepe in Context: An Early Holocene Ritual Site in a ‘Core Zone’ of Neolithisation’, presented by Lee Clare (DAI, Berlin) debated the chronological dating and description of the site, particularly the architectural remains of the PPN, including the enclosures and pillars. Huge monolithic T-shaped pillars were incorporated into these stone enclosures. The enclosures were intentionally backfilled at the end of their use. In the PPNB, a terrace was established around the pillared areas. Recent investigations at the site show that cisterns and carved channels were significant features of the time which might have been used for water management. One cistern was found with many animal bone fragments, sometimes covered with red ochre. Although the site is mostly believed to have been a ritual area, some evidence like bone and bead working suggests possible domestic spaces. Göbekli Tepe, however, can be taken as an indicator of social grouping among the foragers.

Southern Jordan was the focus of Bill Finlayson’s (CBRL, London) contribution (‘The Neolithic of Southern Jordan’). Starting with a chronological debate, the settlement diversity was shown in the region. In addition, the phenomenon of mega-sites and their expansion during LPPNB were targeted. Communal storages with raised floors at Dhra’ show a kind of food sharing. Communal circular buildings at Beidha and the variation in architectural remains at Shakarat Musay’id were subject of the presentation. Based the zooarchaеological analyses, southern Jordan must have faced the introduction of domestic animals during LPPNB.

European coastal zones and their role for research on global Neolithisation processes were stressed by Friedrich Lüth (DAI, Berlin) who spoke about ‘Submerged Prehistoric Landscapes and the Neolithic of Coastal Zones in Europe’. Palaeoclimatic evidence...
indicates that coasts were located at altitudes c. 140 m lower than today, reaching around 9,000 cal BC 40 m below the present sea level. The changes of the Baltic Sea levels, the methods of underwater excavations, and Mesolithic period in northern Germany and southern Scandinavia (during which fishing was the main food source) were discussed. During the early Neolithic (early 4th millennium BC) burials were accompanied by goods such as vessels and beads. It is believed that aDNA analysis would help to increase our knowledge on the origins of Mesolithic-Neolithic peoples in the Europe.

An overview of the role of palaeoecological reconstructions was given by Elena Marinova (KU Leuven): ‘Paleoecological Dimensions of the Beginning of the Neolithic in the Near East: Overview and Future Perspectives’. She explained new evidence available, addressing the character of environment and climate during the early Holocene. In this regard, lake diagrams, site pollens (notably from Chogha Golan) and other bio data were taken to show environmental amelioration. Vegetation history indicates a spread of woodlands in the early Holocene across the Near East, based on data we have from lakes such as Göl Hisar. This development of vegetation must have played an important role in Neolithisation process.

The contributions by our – unfortunately unavailable – colleagues Barbara Helwing and Andrea Ricci on ‘Early Settlement of the Southern Caucasus: Recent Azeri-German Investigations on the late Neolithic of the Mil Plain’ was read by Judith Thomalsky. The results of excavations and surveys of the ongoing project provide significant insights into social feasting, the creation of communal spaces and other social practices that were developed to express and strengthen communal identity during the Neolithic period.

Finally, the organizers (Hassan Fazeli and Judith Thomalsky) summarized the lectures, their question and results, and tried to draft mutual points of understanding and perspectives for the future research, as they emerged during the two days of the conference (Fig. 3). Judith Thomalsky emphasized the fact that the Neolithic period can be regarded as the most innovative period in prehistory when not only domestication, food production and social accumulation took place but also the first deliberate management of new resources such as precious stones and metal started, including – at least – the evolution of explicit social practices targeting to strengthen social ties in communities. All these very different and heterogeneous aspects can be set onto a more generalized “global timeline of Neolithic innovations” that – in a second view – clearly reflects overlapping or interactions, co-inventions, effects of linked innovations, whether in social dimensions or in technologies.

In his concluding talk, Friedrich Lüth, as the representative of Research Cluster 1 (From Hunter to Sedentism) of the DAI that was involved in the organisation of this conference, invited the participants to publish the papers presented in the conference. Lastly, he re-emphasized some important topics, such as the role of coastal zones in Neolithisation of Southern Iran to be addressed in future.

The next two days were devoted to field trips to visit some Neolithic sites on the Tehran and Kashan Plains (Fig. 4), mainly Tapeh Cheshmeh Ali south of Tehran and Tapeh Sialk near Kashan. Hassan Fazeli Nashli, who directed excavations at both sites, guided the site tours, highlighting the importance and archaeological implications of these Neolithic sites on the Northern Central Plateau of Iran.

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Kubíková, Barbora  
2015 *Morphological Study of Sling Projectiles with Analysis of Clay Balls from the Late Neolithic Site Tell Arbid Abyad (Syria)*. Master Thesis, Centre of Prehistoric Archaeology of the Near East, Masaryk University, Czech Republic. Supervisor: Dr. phil. Maximilian Wilding

**Abstract**

After realizing the interpretation of plain, ball-like items of stone or clay as sling bullets is contested (Tsuneki 1998: 111-112), the goal of the thesis was to look for ways to avoid being caught in controversial assumptions about their real function.

The first part of this effort has been to identify the common shapes of the plain, rounded small objects cited by researchers as sling missiles. Six basic forms have materialized from the BA thesis (Kubíková 2013). The cylindrical form was disqualified, which has already led to excluding countless plain objects that were formerly eligible for interpretation as sling missiles.

The logical next step was to study the range of common weights and sizes of sling projectiles in order to further thin down the large category of plain rounded stone or clay objects.

Therefore, the MA thesis tried to establish firm morphological means for the identification of sling projectiles in the archaeological record of sites in the Near East. This effort concentrated on the metric data, physical properties and design of artefacts used as ballistic bodies in order to form parameters characteristic only of sling shots. However, as a consequence of the recent controversy in the identification of rounded handy-sized objects of clay or stone (henceforth called RHO) their interpretation has become volatile. Researchers have proposed explanations that have nothing to do with a ballistic use, such as cooking stones, weights, preparatory lumps or clay, *etc.* (Atalay 2005: 139; Franz 2010: 79). Due to this ambiguity, the size, weight and form parameters of sling missiles cannot be deduced directly from Near East archaeological artefacts.

To cope with this stalemate, it was decided to turn to the study of past and recent sling projectiles in several geographic locations in the Pacific Ocean and North and South America. The rational of this ‘move abroad’ was to explore whether dimensional parameters could be established among unambiguous sling projectiles, namely cases of their attested use by recent ethnographic societies.

On the supposition that normative principles of physics are ruling the manufacture of these ballistic objects, it has been thought that reasonable parameters of size and weight could be established. The conviction of the author is that such parameters could then be implemented in interpreting RHOs from Near East prehistory, by eliminating RHOs which fall outside these boundaries as possible sling projectiles.

Consequently, the majority of the thesis is a detailed discussion of morphological parameters of sling projectiles based on diverse information from physics,
ethnographic records, experimental archaeology, historical and modern usage. Parameters are differentiated between projectiles made of clay or stone, and between manufactured or natural (unmodified) objects. The plotting of weight, length and diameter data of projectiles from various unambiguous contexts show congruence and clustering to a degree not imagined at the beginning of the investigation. These strikingly similar metrics for sling shots around the globe and from different time horizons allow bounding values to be created which frame plausible upper and lower limits of size and weight for objects intended to be launched via a handheld sling. The resultant K-square frame was determined to be: Width: 2 cm (min) – 5 cm (max), Length: 4 cm (min) – 8 cm (max), Weight: 20 g (min) – 250 g (max).

The study includes a considerable amount of archaeological information and photographs of ‘sling stones’, ‘sling balls’ and ‘sling projectiles’. These have been brought together to spur comparisons to other objects and to assist archaeologists in labelling small rounded objects that lack other distinct traits.

The dimensional limits for sling projectiles were corroborated through further sources. For example, measurements of clay or stone balls that are exclusively thrown by hand, and parallel data on sling projectiles acquired by the author through the support of the modern-day slinger community in Mallorca. These users keep the historic slinging tradition alive on the Mediterranean island in a sports context.

The MA thesis closes by checking the usefulness of the size and weight bounding values for Near Eastern archaeology. To this end, the sling missile parameters derived from ethnography, over-seas archaeology and more recent historical periods were applied to the plain ‘clay balls’ found at the Late Neolithic site Tell Arbid Abyad during the first three excavation campaigns (2007-2009). The dimensions of RHOs from the site plot in clear-cut clusters: (1) a recognizable group that largely fit the parameters of established sling missiles, and (2) a group of smaller rounded clay objects that appear to be unfit for slinging as they are below the bounding limits in both size and weight. The crucial observation is that contrary to expectations, there is scarcely an ‘overlap problem’ hampering the interpretation of RHOs recovered from the trenches at Tell Arbid Abyad.

The exploratory study shows that bounding values established from projectiles outside the Mesopotamian context are viable in making headway in the current interpretive stalemate situation concerning RHOs. The proposed parameters will be useful primarily to define a more limited subset of ‘potential sling missiles’ within the impressive number of undecorated small balls of clay or stone found at some Near Eastern archaeological sites (Atalay 2005: 140-145). If shooting tests, use-wear study, or experimental reconstruction of production or use contexts are done as future steps in research, it may be possible to further narrow this multitude to the more circumspect subset of ‘probable sling missiles’.

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