

EASTERN BADIA ARCHAEOLOGICAL PROJECT

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In the late 1970s and 1980s, systematic investigations by Andrew N. Garrard and Alison Betts revealed the presence of ancient social groups in the unforgiving steppe and desert of eastern Jordan. This groundbreaking research was hampered by a sampling problem because the area is vast and their research areas relatively limited. Based on those excavations and surveys, they concluded that the area was only sparsely populated by very small groups, perhaps families, conceivably hunter-gatherers moving from place to place based on the availability of water, who perhaps added the novel element of herding to their subsistence practices.

The Eastern Badia Archaeological Project, a joint project of the Oriental Institute of the University of Chicago and Whitman College, examines two study areas (Wadi al-Qattafi and Wisad Pools) in the area of the Black Desert investigated by Andrew Garrard and Alison Betts. Pilot seasons conducted between 2010 and 2014 recorded and explored structures in these two areas. Our initial impressions, based on limited survey and recording, led us to suggest that these clusters of collapsed structures were tombs, presumably of transhumant pastoralists passing briefly through this very arid region. The dates of these mortuary structures, tombs, and other anthropogenic features were unknown due to the lack of chronologically diag-



Figure 1. Aerial view of Mesa 7, with collapsed structures on lower slope (photo: A. C. Hill)



Figure 2. South slope structure #1, Mesa 7, before clearance (photo: Y. M. Rowan)

and a line of 55 constructed chambers) are visible, we later realized that approximately 100 collapsed structures of basalt also extend along the slopes. On the southern slope, one collapsed basalt structure (SS-11) was selected for excavation because an intact entrance was visible. We initially posited that this may be a burial structure, but the oval, corbelled dwelling (ca. 2.0 × 3.0 m) had another eastern entrance opening onto a courtyard with a small hearth, and an attached storage room with a pillar supporting a roof, still standing. A charcoal sample (5475–5325 cal. BC) from an interior hearth supports the Late Neolithic dates based on the excavated arrowheads (Rowan et al. 2015).



Figure 3. Final overhead photo of SS1, Mesa 7 (photo: Y. Rowan)

nostic surface artifacts. We posited that some structures may be similar to *nawamis* (local Arabic term for burial structures in the Sinai) and other large, dry masonry tombs known in Yemen and Saudi Arabia.

Approximately 60 kilometers east of Azraq, about thirty basalt capped mesas rise 50–60 meters above the relatively flat surrounding *qe'an* (playas) and broad channel of Wadi al-Qattafi. These mesas include Maitland's Mesa (M-4), recognized by Royal Air Force pilot Percy Maitland to have extensive structures covering the top. Although more than 250 structures atop the flat summit of M-4 (huts, animal pens, a tower tomb,

Excavation of that structure, and two others at Wisad Pools, led us to the realization that these structures were not part of a necropolis. For comparison to structure SS-11, we selected a roughly similar, apparently undisturbed structure on the southern slope of Mesa 7 (fig. 1), one kilometer north of Maitland's Mesa. Prior to excavation, uprights that formed part of the wall were visible (fig. 2). The initial clearance of basalt rubble revealed an intact wall, in places nearly 1 m thick. This wall was built with upright slabs for the interior, and an exterior line that includes boulders and horizontal slabs; between those two rows, smaller stones were placed. Our north-south section crossed a central standing basalt pillar, with other supporting pillars along the walls (fig. 3). On the western exterior of the building, a U-shaped feature was apparently a fairly expedient construction of a later date, established on little more than 5–10 cm of sediment above the sloping limestone bedrock. Rubble and cobbles were filled in a foundation trench on the upslope side of the building, which had been excavated into the soft limestone bed-



Figures 4a–b. Cache of seam flint outside the northern wall of SS-1 (left); seam flint knife (right) (photo: G. O. Rollefson)

rock in order to create a level space. On the northeastern exterior, a very compact fill under the stones was full of flint (blades, flakes, cores, burins, and drills), and exposed a small wall built on bedrock. This included the exposure of a cache of largely unretouched tabular flint about a half centimeter thick, with bifacial cortex (fig. 4a). A knife made of this material was found inside the structure in a fire pit (fig. 4b).

Interior dimensions were approximately 4 meters NW–SE, to about 5 meters NE–SW. Removal of paving in the northern aspect exposed an unusual, impressive pressure flaked bifacial point (6 cm) we have termed a Qattafi point. Grinding slabs, an obsidian fragment, Dabba marble, a stone disk with a central drill mark, and some carbonized samples were all found in this context. A hearth became quite large (ca. 52 × 64 cm), occupying much of the floor in the northern section of the interior, to a depth of around 20 cm. Filled with dark ashy silt, the hearth included a sandstone palette fragment and an impressive “seam” knife. Virtually all matrix was taken for flotation samples.

On the western interior, two standing pillars may have defined a spatial separation within the building. Below this compact matrix and a few flat stones, a shallow, light gray, gypsum plaster basin was approximately 80 cm in length and 70 cm in width. Initially built on the bed-

rock limestone and up against small upright slabs lining the interior of the southern wall, a new layer (ca. 0.5–1.0 cm thick) was added on top of the old one, leaving clear finger impressions (fig. 5). We plan to complete excavation of this structure during the 2016 season and hope to explore the exterior area to the south, the leeward side where a courtyard might have been built.

Chipped stone artifacts were numerous, inside and outside of the building. Based on Gary Rollefson’s prelimi-



Figure 5. Two layers of plaster basin inside of SS-1, with finger impressions (photo: M. M. Kersel)



Figure 6. Badia points (photo: G. Rollefson)

nary analysis, burins and drills were quite common, as were notches and denticulates. Blades were most commonly used for tool manufacture. Projectile points were also numerous, and a high relative frequency were badia points (fig. 6). These large points contrast to the very high relative frequency of the much smaller transverse arrowheads found during excavations at structure W-80 at Wisad Pools, which may reflect emphases on different sized game between the two sites. Contrasting this structure to SS-11 at Maitland's Mesa, the number of chipped stone tools is much higher than that of SS-11, although roughly similar in relative percentages of tool types. This may reflect a longer duration of stays, or more frequent visits, at SS-1 in contrast to SS-11 at Maitland's Mesa.

In order to better understand the spatial distribution of the built environment on the landscape, we need to map the variety of structures in our two study areas. Along the Wadi al Qattafi, there are probably hundreds of similar structures represented by large piles of basalt, intermingled with desert kites, walls, animal pens, and other structures. All these elements in the landscape need to be recorded. In order to accurately document the many different structures, we started employing Unmanned Aerial Vehicles (UAVs, or "drones") in order to methodically survey and document the many prehistoric structures distributed atop and along the slopes of these mesas. In recent decades, archaeologists in the Near East have successfully used satellite imagery for mapping the cities and landscapes of the ancient world (and more recently, to note their looting and destruction). For our purposes, satellite imagery provides insufficient resolution for individual prehistoric buildings that tend to be fairly small. As an alternative, we are using drones for survey and mapping purposes and will be some of the first archaeologists to use them for regional survey beyond the site level in Jordan.

After testing the possibility to use aerial photographs and GIS to create high precision, high resolution maps during 2015, we adopted this technique in order to quickly document the many structures, both atop the mesas and below. The high resolution map, which will be orthorectified, provides higher accuracy than is possible even with high-quality laser total stations and in a much shorter time. A short season of aerial mapping was supported with a grant from the Brennan Foundation, funding through a successful crowd-sourcing effort on the website experiment.com, and an American Center of Oriental Research (ACOR) grant to Research Associate Austin "Chad" Hill. In late April, Yorke and Chad began flying a fixed wing UAV and a multi-rotor Dà-Jiāng Innovations (DJI) platform over the mesas and slopes along the Wadi el-Qattafi. Initial flights with the fixed wing during the 2015 field season established the best conditions for flying, and the limitations for collecting data this way in such a remote area. Morning flights were clearly the best time to have a breeze, helpful for successful launches, while afternoons were typically too windy. Batteries allow flights of 15–25 minutes, and batteries for cameras, drones, laptops, and tablets took hours for the gas powered gen-

erator to charge. We also identified a problem with dust affecting the cameras at landing, so a cover was added that protects the camera set into the fuselage. The total result of the survey was some 10,000+ GPS geo-tagged photographs of the landscape that will now be used to construct spatially accurate orthophotographic maps of all the mesas in the survey area.

Our limited investigations at Wisad Pools and Maitland's Mesa suggest that many of the putative tombs and mortuary structures are in fact dwellings, permitting substantial numbers of people to occupy these areas for considerably longer periods of time than we expected. These structures were not recognized as dwellings by scholars because few parallels are known or documented in the region, the post-occupation collapse of these structures effectively obscures their building plans, and the aridity of the desert was assumed to prevent all but the briefest visits. These initial exploratory field seasons of survey and limited excavations now offer compelling evidence for an impressive investment in substantial dry stone masonry buildings that were clearly occupied for longer periods of time, perhaps on an annual, seasonal basis (Rowan et al. 2015). Built with very large slabs of basalt, some weighing ca. 500 kilograms, these structures are not flimsy pastoral camps, but sturdy domestic buildings intended for work and occupation, possibly throughout the Late Neolithic period (ca. 7000–5000 cal. BC). These structures required substantial investment, atypical of short term transhumant pastoralist sites. Contradicting our incorrect hypothesis that these two areas represented necropoli, these dramatic discoveries demand alternative explanations. We propose that hunter-pastoralists exploited these arid eastern lands, perhaps as part of the large-scale expansion of population and settlements that took place during later prehistory.

We must reconsider the nature of buildings on these slopes, the slopes of other mesas along Wadi al-Qattafi, and Wisad Pools. These basaltic structures indicate greater investment and semi-permanent occupation in this arid zone, perhaps reflecting anticipated annual rounds, allowing greater population clusters during the Late Neolithic than previously recognized. Future research will include examination of similar structures, in an attempt to date other structural types; geomorphological investigations, which might determine the existence of a wetter climate with better soil conditions; and additionally aerial mapping using UAVs.

Reference

- Rowan, Y. M.; G. O. Rollefson; A. Wasse; W. Abu-Azizeh; A. C. Hill; and M. M. Kersel
 2015 "Revelations in the 'Land of Conjecture': New Late Prehistoric Discoveries at Maitland's Mesa and Wisad Pools. The Eastern Badia Archaeological Project, Jordan." *Journal of Field Archaeology* 40/2: 175–88.
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