

## Standing stones and megalithic architecture at Wisad Pools in Jordan's Black Desert

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### ABSTRACT

**Keywords:**  
Pre-Pottery Neolithic  
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This paper tracks changes in the use of standing stones and megalithic architecture in the Harrat ash-Sham (Black Desert) of eastern Jordan. Beginning as early as the mid-seventh millennium BCE, large standing stones were incorporated in the center of permanent structures. It is clear from the excavation of four buildings at Wisad Pools and Wadi al-Qattafi, that the central pillars of structures dating to the mid-seventh to the mid-sixth millennium BCE, served a socio-ritual function rather than as roof supports. By the last half of the sixth millennium BCE, the use of central standing stones in structures seems to have been abandoned. In post-Neolithic times megalithic stones, each weighing hundreds of kilograms, were used for the first time in the construction of large structures that probably had a funereal function. Erected stones, probably Chalcolithic or Early Bronze Age in age, rarely occur in stand-alone contexts in the basalt desert landscape, while Iron Age and later megalithic structures appear in a relatively restricted part of the enormous site.

## מצבות ואדריכלות מגליתית בבריכות ויסאד במדבר השחור בירדן

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### ת ק צ י ר

במאמר יתואר ויידון השימוש שנעשה באבנים עומדות (standing stones) במבנים שנתגלו באזור המדבר השחור שבמזרח ירדן, ושינויים שחלו בארכיטקטורה המגליתית באזור למן ראשית האלף השביעי לפני הספירה ועד תקופת הברזל. הנוכחות האנושית באזור המדבר השחור במהלכה של התקופה הניאוליתית המאוחרת, מתאפיינת בהצבה של אבנים עומדות גדולות במרכזם של מבני קבע. מחפירת ארבעה מבנים שתוארכו לתקופה שמאמצע האלף השביעי ועד אמצע האלף השישי לפנה"ס באתר בריכות ויסאד ובוואדי אל-קטפי, ניכר בבירור כי העמודים המרכזיים שנתגלו במרכז המבנים לא שימשו לתמיכה בגג, ותפקידם היה ככל הנראה חברתי-פולחני. במחצית האחרונה של האלף השישי נראה כי ננטש השימוש באבנים עומדות במרכזי המבנים. בתקופות שלאחר התקופה הניאוליתית נעשה שימוש באבנים מגליתיות במשקל של מאות קילוגרמים לבניית מבנים גדולים בזיקה ברורה למסורות הקבורה. רק אבנים עומדות מעטות שהוצבו ללא הקשר יישובי ברור בסמוך אליהן, נתגלו בנוף המדבר הבזלתי, והן תוארכו לתקופה הכלקולית או לתקופת הברונזה הקדומה. מבנים מתקופת הברזל ומגליתים מאוחרים יותר הופיעו רק בחלק מצומצם יחסית של האתר העצום.

מילות מפתח:

ניאולית קדם-קרמי  
אדריכלות עתיקה  
מצבות  
פעילויות טקסיות

## Opening Remarks

I had met Uzi Avner several times at conferences during the 1990s, but it was not until 2006 that I became more closely acquainted with him. My student and I took a break from a survey on the plateau overlooking the Jafr Basin and travelled to Wadi Rum for a day, where Uzi and several colleagues were looking at a few *masseboth* sites in and near the southern end of the wadi. During his discussion of these standing stone shrines, I became fascinated by the "personality" of the builders of such ritual features that he was able to extract from these structures. He followed up by sending numerous PDFs and paper drafts that he had published or submitted, and they contributed to a new excitement about prehistoric desert dwellers. He has continued to send me published reports of his research, which I look forward to with eagerness.

The following year I undertook two brief seasons of mapping and excavation of what appeared to be non-*masseboth* ritual features in the southern Wadi Rum, followed immediately by the beginning of a long-term project in Jordan's Black Desert that also added "personality" to the people of Wisad Pools and of the Wadi al-Qattafi. This closing phase of my prehistory career has been thoroughly satisfying, and I owe deep thanks to Uzi Avner for edging me towards this arena of prehistoric research.

## 1. Introduction

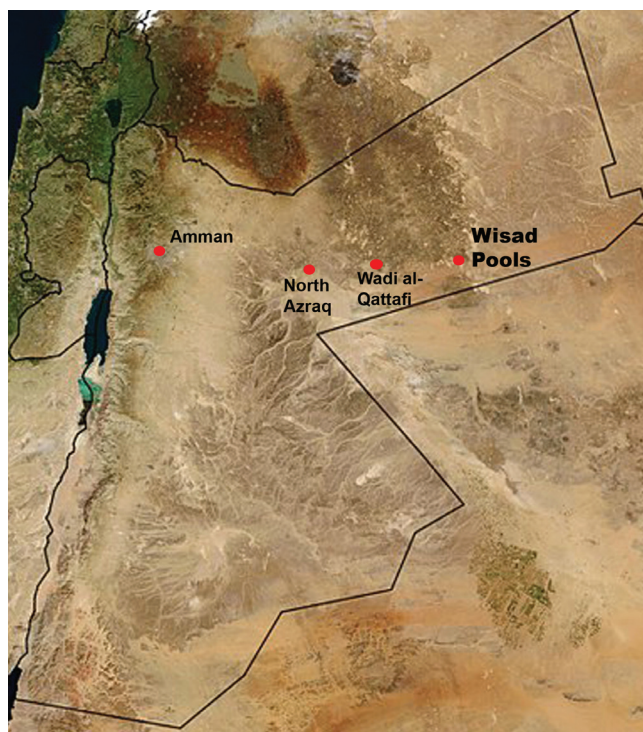
The collapse of Late Pre-Pottery Neolithic (LPPNB) megasites at the close of the eighth millennium BCE led to a significant shift in Levantine populations, with a major movement of people from the Jordanian Highlands to the Jordan Valley and the Mediterranean coastal area and highlands of Israel. Other segments of the megasite populations moved east into what is today steppe and desert, greatly increasing the regional population of the Harrat al-Sham (Black Desert) from almost negligible levels and density in the eighth millennium to unprecedented numbers and concentrations, supported there by higher rainfall and the reliance on large-scale killing of gazelles using kite constructions.

### 1.1. The site of Wisad Pools

The seeds of the Eastern Badia Archaeological Project (EBAP) were sewn in 2002 during the Wadi Sirhan Project that focused on two areas in Jordan: near the Saudi Arabian border in the southeastern part of the country and in the region of Jabal Tharwa on the western fringe of the Wadi Sirhan and the southern edge of the Black Desert (Wasse and Rollefson, 2005). The survey results of both areas recorded many Neolithic sites,

but like other surveys in today's arid regions (Betts et al., 1998; Betts et al., 2013, Field, 1960; Garrard et al., 1993), Neolithic sites were relatively tiny, certainly all under a hectare in area. After the 2002 Sirhan field season finished, a stop was made at a reputed large prehistoric site at Wisad Pools, an astonishing array of buildings, as well as a visit to the mesas of the Wadi al-Qattafi. The first season of survey and excavation at Wisad and Qattafi began seven years later.

The Wadi al-Qattafi and Wisad Pools complexes are the largest known settlements in Jordan's Black Desert (Figure 1). Wisad Pools is spread over approximately 1.5 km<sup>2</sup>, and there are approximately 400 structures (not including animal enclosures). The large majority of the buildings are Late Neolithic (LN; Figure 2), but there are also monumental structures of the post-Neolithic period associated with honoring the dead (Rollefson et al., 2014; Rowan et al., 2017). The short (~1.5 km long) Wadi Wisad bisects the plateau unequally on either side of it, draining a large and shallow catchment area to the northwest. Structures are also divided unequally on both sides of the wadi, with residential buildings mainly to the east of the wadi and monumental and funereal structures to the west and south. Four structures have been excavated, one founded as early as 6,900 calBCE, but the others were constructed in the mid-seventh millennium but lasting well into the sixth millennium i.e. all excavated structures date to the Late Neolithic.



**Figure 1:** Location of Wisad Pools at the eastern edge of the Black Desert (Google Earth photo)

### 1.2. Population

It is moot to estimate the population of the Wisad Pools site complex since there are no sufficient means of establishing precise contemporaneity of the buildings. However, based on the calculations of Kempe and Malabeh (2010) for gazelle kites, the labor requirements of building and maintaining kites must have been high, and the number of people working in teams to butcher, to clean hides, and to transport meat and skins must also have been extraordinary as well (e.g., Rollefson, n.d.), implying the presence of a sizeable population in the region.

## 2. Standing Stones and Megaliths

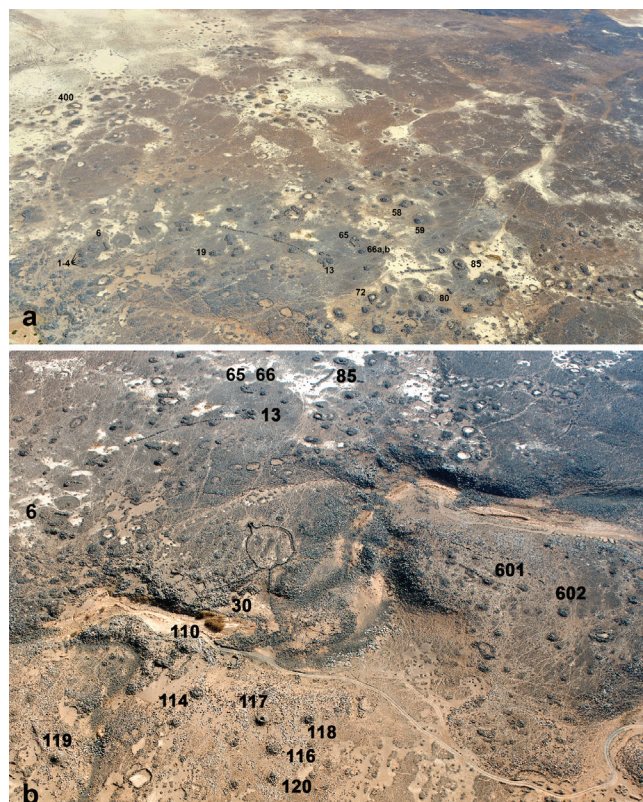
For the purposes of this paper, a "standing stone" is defined as a large, generally rectilinear stone set on end or on edge, while "megaliths" are large blocks of stone used in the construction of monumental structures.

One of the earliest mentions of a standing stone in the Southern Levant was by Kenyon at Mid-Pre-Pottery Neolithic (MPPNB) Jericho, who noted that a 45 cm tall stone was found near a stone socket that would hold the stone vertically in a room, the history of which "is ... highly complex. The alterations are none of them suggestive of ordinary domestic use, and they may be evidence of elaborate ritual practices such as a shrine or house chapel" (Kenyon, 1981, p. 307, Plate 172a). Other similar examples are found at 'Ain Ghazal, where they appeared in restricted contexts during the LPPNB (but none were found in the MPPNB). Their presence in two buildings in the East Field at 'Ain Ghazal lent a decisive cultic nature to structures that had no residential indications, as well as in smaller apsidal buildings throughout the LPPNB site (Kafafi, 2011; Rollefson, 1998).

### 2.1. Central Standing Stones at Wisad Pools

#### 2.1.1. The W66 Complex

During the entire seventh and early sixth millennia at Wisad Pools, standing stones in Late Neolithic structures were placed in the approximate center of circular buildings that were the focus of daily life in the settlements. This is exemplified by the W66 complex that consisted of an irregular circular structure just over 4 m in diameter (W66a) positioned adjacent to the western edge of a small circular stone platform (W66b) about 3.25 m in diameter and c. 30 cm high (Figure 2a).



**Figure 2:** a. The Wisad Pools site east of the short Wadi al-Wisad (photo by David Kennedy, APAAME 20080909\_DLK-363). b. The Wadi al-Wisad flows southward from left to right; the lower (western) half of the image contains most of the tower tombs at Wisad (photo by David Kennedy, APAAME 20080909\_DLK-370)

The central standing stone in Structure W66a was 1.08x0.44x0.30 m in dimensions (Figure 3a); the pillar had been set in a "socket" of chocking stones beneath floor level. The height of the central pillar is too low to be used as a post to support the building's superstructure/roof, if it even had one. Structure W66a evidently suffered from some calamity that destroyed the north and northwestern wall, and in the hasty rebuilding, long and relatively thin slabs set on end were used as opposed to the original overlapping horizontal layers of large slabs. This might be the reason that the central pillar of structure W66 was slightly off-center as excavated, and possibly the original arrangement of features was more symmetrical. Leaning against the eastern wall of W66a was a large, thin natural anthropomorphic slab 93x90x10 cm in size (Figure 3b); notably, a small sandstone figurine with a similar anthropomorphic outline to the anthropomorphic slab, was recovered from the interior of the structure (Rollefson et al.,

2012, Figure 18b). The original floor of W66a was paved with gypsum plaster, and a plastered oval basin was placed between the central pillar and a large basalt block (possibly bedrock) that lay at the entrance of a horse-shoe shaped alcove that had been plastered at least four times (Figure 3a; cf. Rollefson et al., 2012, Figure 15b); charcoal chunks from burning the gypsum to produce the plaster yielded a 14C date of 6600 to 6460 calBCE. The building seems to fit Kenyon's assessment, at least to some degree, of ritual association.

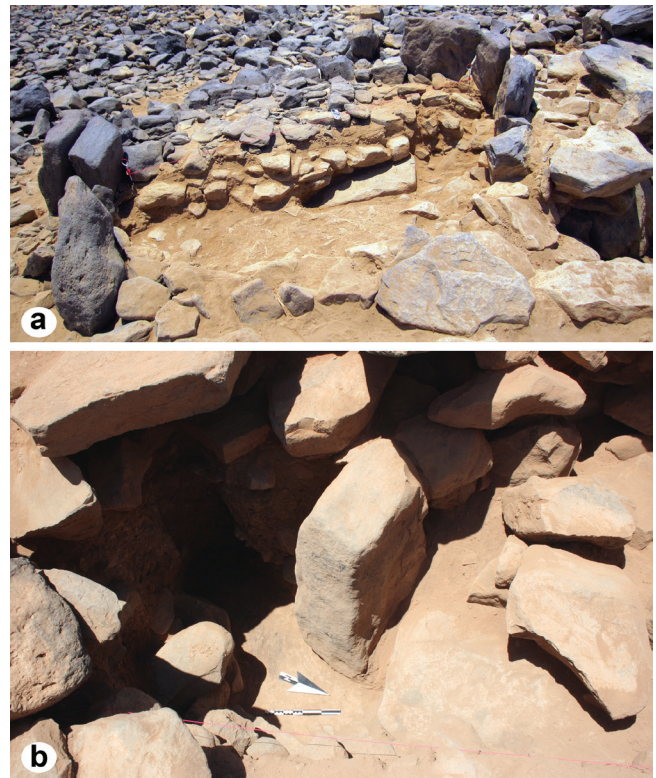
W66b had a relatively regular surface of small basalt stones that filled the low circular wall that included two trios of standing stones, one on the eastern edge of the platform and one on the western edge (Figure 4a). The stones in both trios, ranged from 0.40-0.75 m in height to 0.40-0.70 m in width and 0.15-0.30 m in thickness. The platform was probably a work area, with much debitage and many chipped stone tools, though rare animal bone; the porous surface may also have served to store goods above ground level during the rainy season.



**Figure 3:** a. View to the west of the interior of W66a with a central pillar, a gypsum plaster basin, a large basalt block, and an alcove plastered at least four times. b. View to the northeast of W66a, with an anthropomorphic basalt slab leaning against the wall to the east; cf. Figure 13a. (Photos: G. Rollefson)

### 2.1.2. W110

Another example of a central pillar was found under difficult circumstances. Tower Tomb 110 was constructed on the rubble mound of a collapsed building, and looting just a week before the 2011 excavation season began, revealed an exposure of Late Neolithic artifacts including projectile points and other tools typical of the late seventh millennium. Excavation of the exposure continued to a depth from the surface of about 1.5 m until the overhang of the later building and its rubble became too dangerous to continue. The central pillar was rectangular in cross section, c. 85 cm high, 80 cm broad and 40 cm thick. The size of the original building could not be determined since no intact walls were encountered in the rubble (Figure 4b). A radiocarbon sample was collected from the structure, and is in the process of being analyzed.

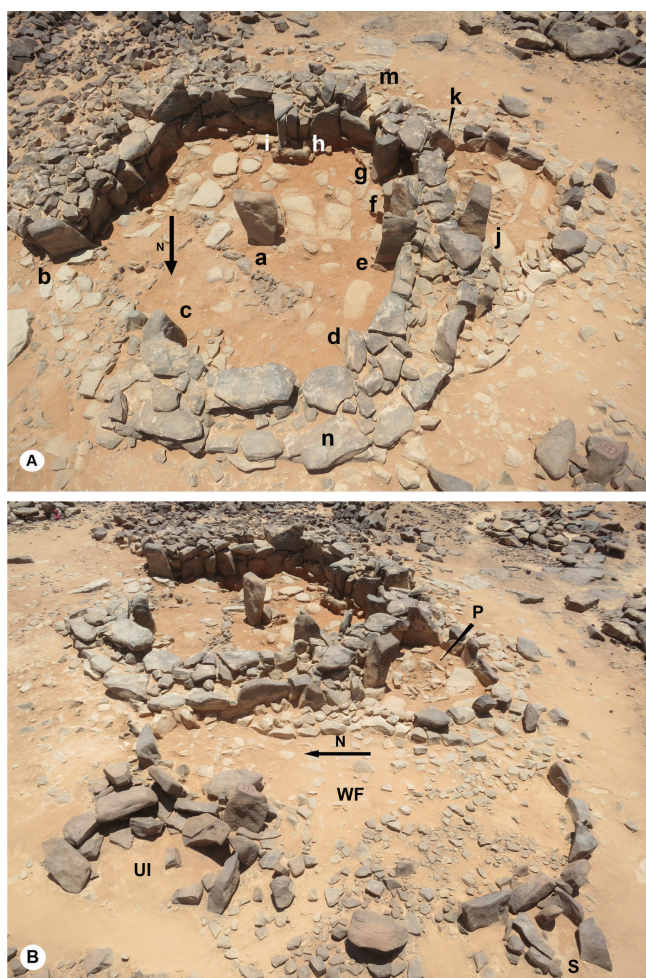


**Figure 4:** a. View towards the south of W66b with stratified interior, three standing stones at the eastern (left) edge and four standing stones on the western edge. (Photo: G. Rollefson). b. Central pillar of the Late Neolithic structure beneath tower tomb W110 (cf. Figure 2b) (Photo: M. Perry)

### 2.1.3. Structure W80

Structure W80, as was the case for W110, was a collapsed building. The collapse served as a mound to elevate a 4.5 m diameter circular tomb with a wall about 70 cm high that was probably built during the Late Bronze or Early Iron Age I (Rollefson et al., 2018, p. 532). W80 is so far the largest of the

excavations at Wisad and the most complex. The main room's diameter varied from 6.5 to 8.0 m, and the building underwent four phases of occupation and renovation during the mid-seventh through the middle of the sixth millennium, as well as a possible phase during the Pre-Pottery Neolithic C (PPNC) period or even earlier (Wasse et al., 2018, 2022). The central pillar (Figure 5A: a) was probably erected early in the use of the structure, as early as the middle of the seventh millennium, as was the case for W66a. The stone in W80 stood 1.18 m high, was 75 cm wide at the top, and 25 cm thick, with chocking stones at its base to ensure vertical stability. Also included at the base of the pillar was a cache of gazelle bones, including a skull (Figure 6). Similar to W66a, there was a horse-shoe shaped alcove between standing stones (g) and (h) (as shown in Figure 5A), although it could not be verified if the alcove had been plastered. There were, on the other hand, small patchy areas of white plaster on occupation surfaces at the join with the walls.



**Figure 5:** A. View towards the south of the W80 interior: a-central pillar; b-l standing stones, m a window in the alcove; j-k standing stones in the "porch"; n the original wall of W80. 5B. View towards the east of the W80 complex: p-"porch", wf-western forecourt; S-"shrine"; U-I-U-shaped installation (Photos: Y. Rowan)



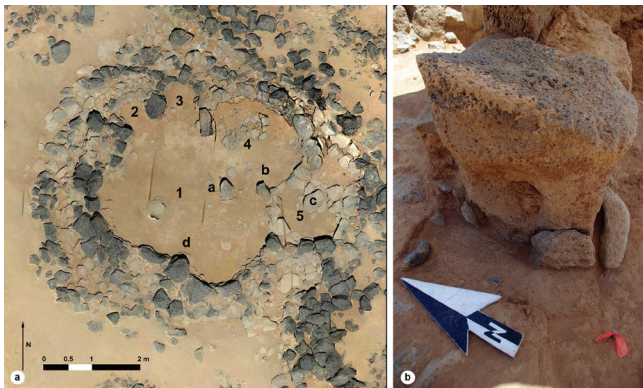
**Figure 6:** View to the east and to the north of the central pillar of W80. (Photos: Y. Rowan)

The wall of the main room was constructed of massive stones, built in two phases, with wall (n) (shown in Figure 5A) a part of the original construction that had an internal floor area of 63 m<sup>2</sup> (exterior diameter of 10 m and an interior diameter of 9 m). A later wall section (Figure 5A: c-d) reduced the interior diameter to 50 m<sup>2</sup>, i.e., by 20% (interior diameter of 8 m). Eight standing stones set on end (75-80 cm high), were incorporated into the newer wall (Figure 5A: b-i). Two more standing stones, (j) and (k) (Figure 5A), flanked a small door connecting the room with a 2.4 m circular "porch" 2.4 m in diameter (Figure 5B: P), that was attached to the external southwest section of the main room. There was also an irregular forecourt, about 11 m in maximum dimension, that was probably used as a work place (Figure 5B: WF) and had been damaged by post-Neolithic activity. The main building also included a window (Figure 5A: m) with two narrow jambs and a broad, thin flat stone as the sill; the window was blocked in a later phase, possibly at the same time that the door (Figure 5A: b and c) was reduced from a width of 2.3 m to 60 cm (Rowan et al., 2015). Radiocarbon dates from all phases of occupation range between 6590 to 6580/6570 to 6440 cal BCE at the base, to 5710 to 5610 /5590 to 5570 cal BCE near the top of the occupation (Recently a new date of 7258 ± 30 was received, an LPPNB indication for the earliest phase of occupation).

#### 2.1.4. W400

W400 has provided another early 14C date for Wisad Pools: 7040 to 6680 calBCE. The structure is located in the far north of Wisad Pools (upper left corner of Figure 2a), a part of the hut-and-pen arrangement common in this part of the site. The building has roughly the same floor area as W66, but the interior

is organized differently (Figure 7a). In addition to a main room (Figure 7a: 1) there are four "bays" (2–5) along the northern and eastern walls. There are four stones set on end, the tallest of which was 35–40 cm (Figure 7a: a). This stone is the shortest of the central pillars of the other buildings described above, and furthermore, it is not at the center of the main room. Figure 7b reveals that standing stone (a) is chocked with supporting rocks to stabilize its vertical orientation; this stone was set later than the original floor, but the phasing of the use of W400 is incomplete since the Covid pandemic prevented a final season of excavation of this building.



**Figure 7:** a. Overhead view of W400; a, b, c, and d are vertical stones. 1 is the main room and 2–5 are small bays. 7b. View to the northeast of a short standing stone (a in Figure 7a) sitting in the midst of chocking stones (photos by Y. Rowan)

### 2.2. Isolated Standing Stones

Isolated standing stones are rare in the Black Desert, at least at Wisad Pools and Wadi al-Qattafi. W85 (lower right in Figure 8a) is a looted "bull's eye" tomb, to use Kennedy's term for this kind of funereal structure (Kennedy 2011, p. 3189). It consists of a central burial mound surrounded by a circular wall of stone; a row of 13 stone piles extend to the west of the tomb complex, probably symbolic of scheduled cenotaphs to honor the entombed person (Rollefson et al., 2012, p. 41). Between the circular wall and the tomb is a single, thin sub-circular stone standing on edge that is more than a meter in diameter and c. 10 cm thick (Figure 8a). Due to its location within the circular space between the wall and the tomb, it clearly has some ritual meaning, but nevertheless it is a unique element in the mortuary architecture of Wisad Pools and absent in Wadi al-Qattafi.

Figure 8b shows another thin, sub-circular stone, of similar size (W74-1) to the one mentioned above, that was located about midway between Tower W72 and one of the excavated structures W80 (Figure 2a). The stone is set on edge but doesn't appear to be associated with any architecture, although it appears to have been chocked into its position.



**Figure 8:** a. Detail of "bull's eye" Tomb W-85, with a lone sub-circular standing stone at lower left, view towards north. b. View to the south of a lone sub-circular standing stone W71a. (Photos: G. Rollefson)

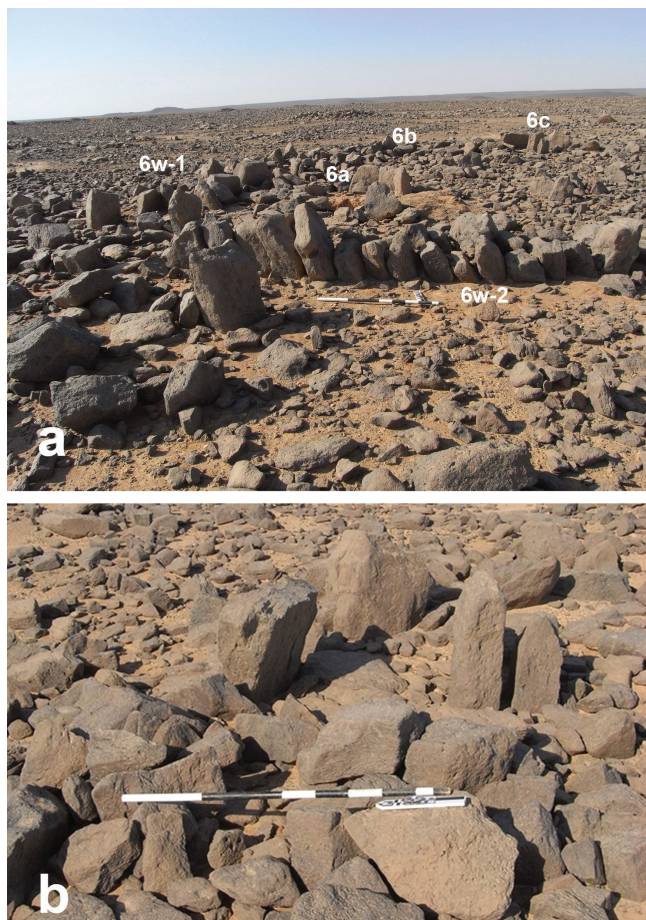
### 2.3. Rectilinear Structures

Rectangular/sub-rectangular constructions occur across the core area of Wisad, and examples include #s 1-4 and 6 in Figure 2a. The double cyst burial, W1, is made of large basalt slabs set on edge with dimensions of 4.85 m N-S and 4.54 E-W; a thin interior wall separates the two inner rooms. W2 is also an on-edge slab-built double cyst structure, about twice the size of W1 and surrounded by a circular wall with a radius of c. 4 m. W3 is a simple rectangle with large slab walls, as is W4, though on a slightly smaller scale.

W6 is a complex arrangement of walls and rectilinear features incorporating large basalt slabs set on edge. A wall of large megalithic basalt slabs more than a meter in height, c. 50–60 cm wide and 25 cm or more in thickness, that extends in a curving

arc for 44 m from west to east (Figure 9a: 6w-1); the eastern end has been robbed. Within this curved wall is a rectangular structure attached to the southern face of the wall; the western wall (Figure 9a: 6w-2) is 5.75 m long N-S and consists of basalt slabs on end but back to back, similar in layout to books in a bookcase; some of the slabs are similar in size to wall 6w-1, although most are somewhat smaller, and often they are blocks rather than slabs. At the southern edge of wall 6w-2, it makes a 90° turn to the east and continues for 6.1 m until the slabs were robbed. The rectilinear walls are possibly liminal borders, and the same can possibly be said for the long, curved wall.

To the south of wall 6w-1 are three rectilinear slab structures on the surface (Figure 9a: 6a–c), possibly cyst graves. The walls are again massive slabs on end/edge, creating box-like enclosures (Figure 9b). Cyst 6a measures 2.6x2.0 m; 6b is 4.0x1.8 m; and 6c is 3.0x2.4 m in size.



**Figure 9:** a: Northern (6w-1) and western (6w-2) walls of Complex 6, with three rectangular features 6a, 6b and 6c, each with four sides of standing stones set on end or edge. b: Feature 6c with collapsed edges. (Photos: G. Rollefson)

## 2.4. Courtyards and Plazas

Many of the buildings at Wisad have courtyards: walled areas outside of a structure that apparently either represented working areas (e.g. Late Neolithic W80) or served as liminal boundaries. Some courtyards were walled and paved (e.g. post-Neolithic W19 and W59) but had no structural features, while others had elaborate but small constructions within the courtyard (e.g. post-Neolithic W13 and W58).

### 2.4.1. W13, W13-8 and W13a

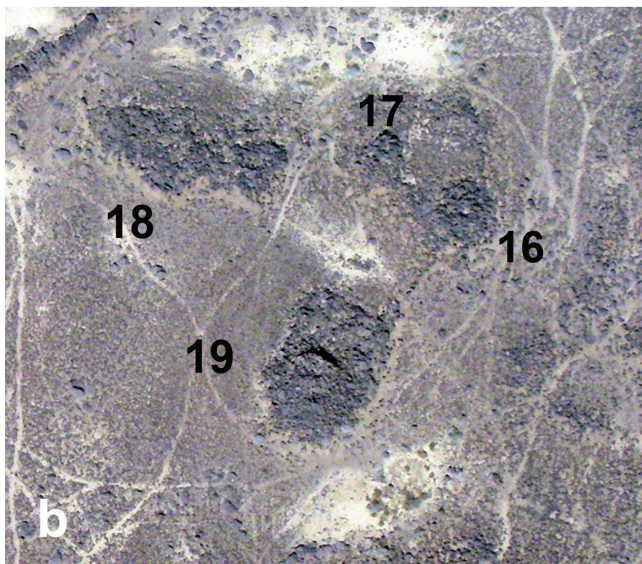
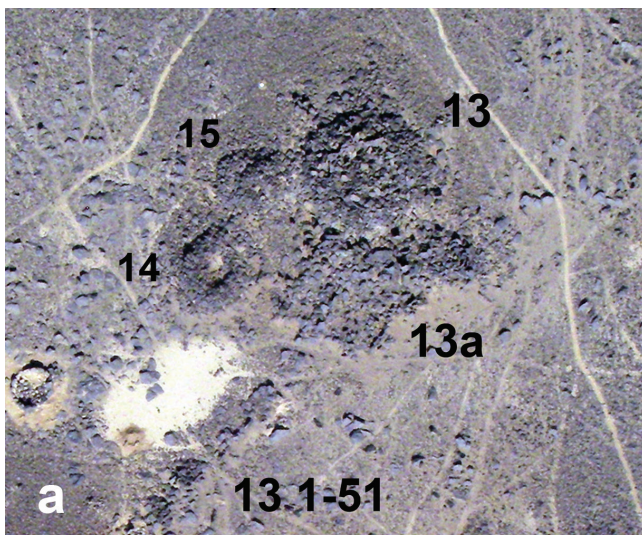
W13 is a badly damaged Tower Tomb (Figure 10a) that was associated with a chain of 51 cenotaphs (Figure 2a); W13-1 through W13-7 were simply piles of rocks (similar to all 13 of the chain of features associated with W85), but from W13-8 to W13-51 the features were all constructions of chambers, sometimes built with horizontal slabs that formed walls. All chambers were roofed with large slabs of basalt, although W13-8, which was excavated, had walls comprised of vertical slabs. W13-8 was c. 2x1.75x0.90 m in size and empty of any artifacts. Between Tower Tomb W13 and the first cenotaph of stone in the chain, was a large square-walled "plaza" (W13a) that was paved with basalt and oriented slightly off from the general direction of the chain. The plaza also included four clusters of rectangular structures built of vertical slabs of basalt similar in size to those in W13-8, but it was not possible to determine if the structures were ever roofed.

### 2.4.2. W19

W19 is a large tomb (3.5 m interior diameter) with thick corbeled walls c. 1 m thick. There is a square-walled, two-tiered courtyard oriented towards the east (Figure 10b). The upper courtyard is approximately 25-30 cm higher than the eastern tier, and the courtyard is filled with medium-sized irregular stones, not slabs. Each terrace section is c. 4 m N-S and 2 m E-W. The eastern façade of the tomb is flat, and there is evidence that this had been penetrated (perhaps to add a burial?), and then closed again. The tomb was looted between 2019 and 2021, and one can see that the interior western wall had been covered with gypsum plaster while in the back-dirt were fragments of human bone, including pieces of a cranium. About 15 m to the northeast is Tomb W18, also looted, and its interior chamber was also coated with gypsum plaster.

### 2.4.3. W59

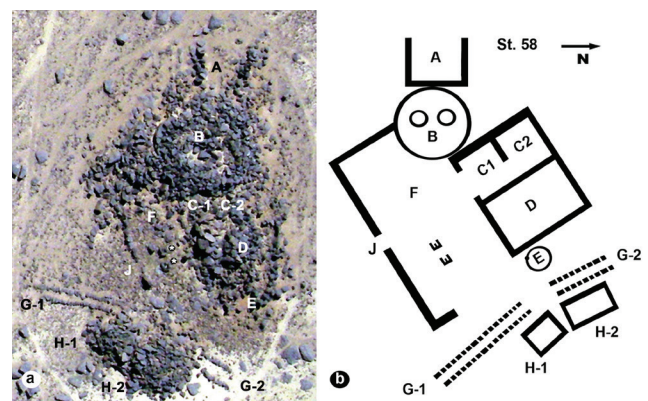
W59 is another large tomb with a walled courtyard oriented towards the east. The courtyard has a low wall that is apsidal on the eastern side, and the pavement consists of small, fist-sized basalt cobbles with dense quantities of micro-debitage and chips of translucent flint of various colors interspersed throughout. The apsidal courtyard measures 7.5 m E-W and 5.6 m N-S. The eastern façade of the tomb is flat, as in Tomb W19 described above, and is above two small steps, each c. 25 cm in height. While difficult to determine accurately, the tomb appears to have been 6-7 m in diameter.



**Figure 10:** a. View to the northeast of tower tomb (13), rectangular plaza (13a) and the beginning of the chain of 51 rock piles and chambers. b. View to the northeast of megalithic Structures 18 and 19 (Google Earth images)

### 2.4.4. W58

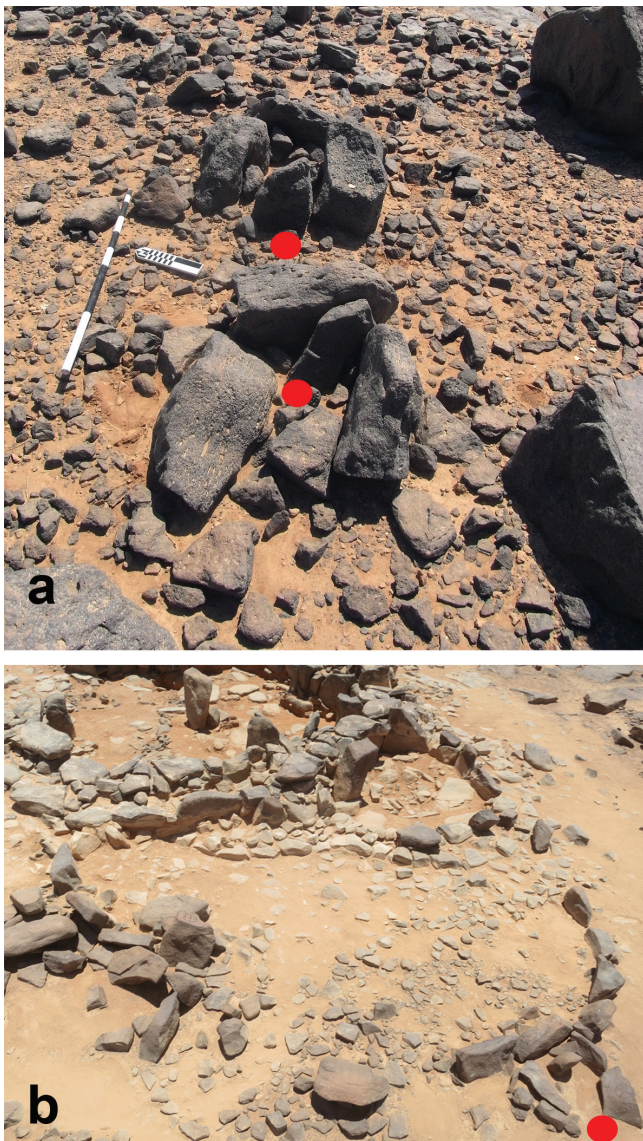
One of the most complex structures with a walled courtyard is W58 (Figure 11a–b). The courtyard (F) is rectangular, measuring 9m E-W x 4m N-S with a doorway (J) near the center of the southwestern wall. There is a tomb with two or more probable burials in it (B). A doorway 1.90 m wide opens from the courtyard onto two empty chambers, C1 and C2, each c. 3x3.5 m with massive slab walls. A large room filled with basalt rubble (D) is adjacent to C1 and C2. A circle of low stones 2.2 m in diameter has one standing stone 1.3 m high in the southwest rim (E). Two possible cyst burials to the east, H1 and H2, and a curved walkway (a single small stone high) G1 and G2, that was interrupted near the cyst burials.



**Figure 11:** a. View to the west of Structure 58 complex. A-U-shaped installation; B-two-chambered tomb; C-1 and C-2 double room; D-room filled with collapsed stones; E-circular installation with a standing stone at the western edge; F- southern courtyard; G-1 and G-2 curbed pathways; H-1, single chambered cyst tomb; H-2, double chambered cyst tomb; J- entrance to courtyard (Google Earth image). 11b. Sketch of the complex (G. Rollefson).

At the western end of the complex is a large U-shaped feature (Figure 11: a) whose northern and southern walls are each 3.9 m long and the eastern wall is 3.5m in length with the opening oriented towards the west. Inside the courtyard are two small features (shrines?), built of three walls that are a single stone high and c. 40 cm long with a single short stone on end (35-45 cm) in each feature. These features appear to be miniature versions of the larger U-shape structure A (Figure 12a). The same arrangement is mirrored in the western forecourt of W-80 (Figure 12b; cf. Figure 5B, lower right corner), which clearly are post-Neolithic additions.



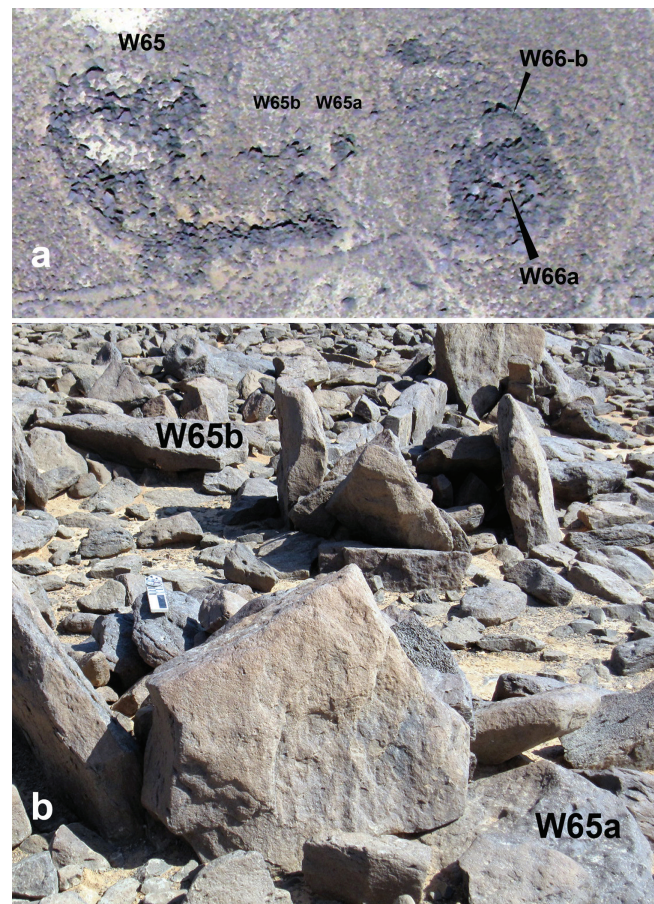


**Figure 12:** a. Two U-shaped 3-walled "shrines" with a small standing stone (red circles) in the enclosures in the Structure 58 complex (see Figure 10) (Photo: G. Rollefson). b. Three-sided "shrine" with low standing stone (red circle) at the western edge of the western forecourt of W80 (see Figures 5B) (Photo by Y. Rowan)

#### 2.4.5. Rectangular "Bins"

W65 is also a complex structure (Figure 13a) with a walled rectangular courtyard, oriented N-S, in front of a badly damaged structure containing both rectilinear and curvilinear elements. Along the western wall there are a series of chambers, similar to those in 13-8 through 13-51, but those in W65 were evidently storage features. A double-curved pathway leads from the north to W65, then continues on as a single line of stones to W66 to the south and beyond. Just outside the northeast corner of the courtyard are two rectangular features constructed with large basalt slabs that measure c. 70-85 cm in height, 40-45 cm in width and 15-20 cm in thickness (Figure 13b). The features

evidently were never covered, and they were empty when we probed them such that their intended use remains conjectural. Two more such arrangements were also noticed on the W13a "plaza".



**Figure 13:** a. View towards to east of the layout of complex W65 with two small rectilinear enclosures (W65a and W65b) (Photo: A.C. Hill). 13b. W65a and W65b enclosures of basalt slabs erected on edge, each approximately 1 m<sup>2</sup> in area (Photo: G. Rollefson)

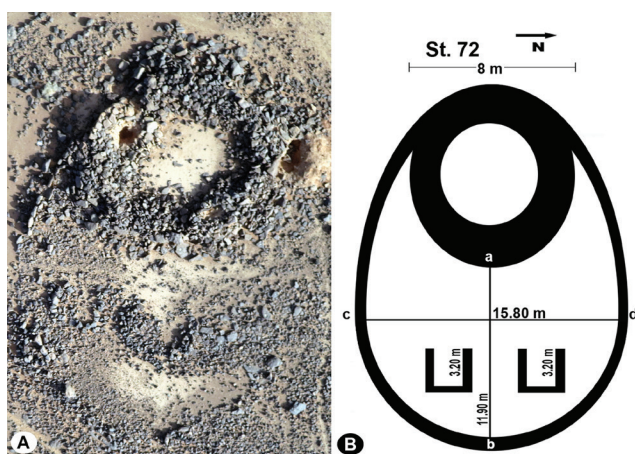
### 3. Tower Tombs

There are eight megalithic Tower Tombs at Wisad Pools (W13, W72 (?), W110, W117, W118, W119, W601, and W602) and possibly ten if the massive mound W30 and the smaller W114 (Figure 2b) are considered as collapsed towers. The area west of the Wadi Wisad was most popular for such mortuary structures. Two of the towers had chains of cenotaphs, W13 and W601; the latter had a chain of eight simple rock piles.

#### 3.1. W72

W72 is a unique tower in the sense that it is the only one at Wisad that is located on the edge of a large courtyard (Figure 14). The structure is also extraordinary compared with the other towers at Wisad in terms of its dimensions: a diameter of 7.5-8.0 m

with walls 1.25 m thick, and an interior space about 5.5 m in diameter. The tower was constructed by horizontally stacking a minimum of eight layers of basalt slabs c. 70 cm long, up to 50 cm wide and c. 25-30 cm thick. A large forecourt on the eastern side of the tower was enclosed by a wall of thin slabs (c. 70 cm long, 50-60 cm high and 15-30 cm thick) in a long arc, but much of the wall has been robbed. The courtyard was once paved with flat slabs, but much of the pavement has also been taken away. Two low U-shaped features in the eastern half of the walled enclosure measure about 3.5 m on each edge, and the opening of both is towards the west (Figure 14B). These features were built of small, thin basalt "tiles" and were level with the surrounding surface, but also invoke the U-shaped features associated with structures W58 and W80.



**Figure 14:** a. Photo (A.C. Hill) and b. sketch (G. Rollefson) of the large tower and eastern courtyard of Structure W72. Two U-shaped, three-sided stone structures level with the ground in the eastern half of the courtyard

### 3.2. W117

This Tower Tomb is a good example of the state of isolation of most Tower Tombs (Figure 2b). Like most Tower Tombs, W117 is c. 2.00 m high and 3.00 m in diameter at the base and built, as most Tower Tombs were, on a collapsed earlier (possibly Late Neolithic) structure. Due to looting the interior of the structure is almost completely empty. There is no indication that the tomb had an "entrance", but that the tower was built around the body as was the case for the tomb resting above the collapse of W80 (Rowan et al., 2015). Tower Tomb W117 was used, on the other hand, as an accessory for another tomb consisting of a small chamber built against the eastern base of W117 (Figure 15a–b). The chamber was 2.30 m long (see the arrow in Figure 15a), 1.20 m wide and 1.00 m high. The gallery was sealed at the eastern edge by a standing stone 1.28 m high, 0.75 m wide and

0.35 m thick and probably weighing more than a ton (Rollefson et al., 2012). Dating this addition to the tomb to the late first millennium BCE or the early first millennium CE is based in part on the concentration of numerous Safaitic inscriptions and rock art within a radius of c. 20 m around W117 (see below).



**Figure 15:** a. View to the west of Tower Tomb 117 with a later entrance chamber added to the eastern face of the original tomb (indicated by the arrow). b. View towards the west of the blocking stone (Photos: G. Rollefson)

### 3.3. W110

W110 was a Late Neolithic structure that had collapsed forming a mound and was later used as an elevation on which to construct a Tower Tomb above it. Unfortunately, Tower Tomb W110 was looted the week before the 2011 season of excavations began. Like the other Tower Tombs (excluding W72), W110 is about 2.00 m high, with an external diameter of about 3.00 m at the base. The looting caused most severe damage to the eastern façade, including the destruction of what was a later addition during the Safaitic period similar to the chamber at W117. The location of what was probably another blocking stone, 70 cm high and 50 cm wide at the base, situated above the tomb's slope, is shown as a red dot in Figure 16a–b. The looters left behind a small assembled collection of human bones on a rock next to their intrusion, as well as a small (10x15 cm) patch of woven wool cloth dyed yellow, confirming the age of the destroyed Safaitic chamber; inscriptions and rock art were also in the near vicinity.



**Figure 16:** a. Approaching Tower Tomb W-110 from the south. The red circle indicates the location of the blocking stone in Figure 14b. b. Large basalt blocking stone viewed from the east, with the northern jamb still intact (Photos: G. Rollefson)

### 3.4. W119

W119 is approximately 90m WNW of W110 and represents the remains of another two-phase Tower Tomb with strong similarities to W110 and W117. The circular tower itself (c. 3.00 m diameter) was asymmetrically positioned on top of an earlier platform or mound (again, possibly a collapsed Late Neolithic structure). Another similarity was a vestibule constructed on the eastern edge of the tower and a sealing stone, albeit tumbled and partially covered by tumbled basalt (Rollefson et al., 2012, p. 36). Within a 10 m radius of the tomb was the densest concentration of Safaitic rock art and inscriptions, but these date the destroyed Safaitic chamber, not the original Tower Tomb.

### 3.5. W120

W120 is a tomb that was looted sometime before 2008 (when the Eastern Badia Archaeological Project began). It is located

in the Tower Tomb "area" (Figure 2b), but is itself, not a tower. The construction method using long, narrow, and thick basalt blocks (Figure 17a) evokes to some degree a resemblance to Qulban Beni Murra (cf. Gebel, 2016, Figures. 14–17). There appear to have been two or four intact chambers in this construction, at least one of which was looted. The backdirt included some human bone, and similar to the looter of W110 (the same person?), there was a small assemblage of potsherds on top of the backdirt that could be restored enough to provide evidence that the tomb dates to the fifth to fourth millennium BCE (Figure 17b–c), an age that is within the general temporal range of Qulban Beni Murra.



**Figure 17:** a. View to the west of looted megalithic Tomb W-120 (Photo: G. Rollefson). 17b, c. Views of a restorable pot from the looter's back dirt (Photos: Steve Meyer)

### 3.6. W116

There was a frenzy of looting during the first two Covid years (2019–2020) that severely damaged many of the larger structures at Wisad Pools. One of these was W116, a collapsed burial mound that used very large rectangular slabs in its construction; one enormous stone was 2.05 m long (Figure 18a). There were two chambers in the tomb, eastern and western rooms, separated by large slabs. It is not possible at this time to try to reconstruct what the exterior of the tomb may have looked like, but the long and narrow stones may have had a relationship with the

technique used at W120. Notably, one stone slab bore a thick coating of lime plaster (Figure 18b, lower left corner); gypsum plaster had been used in W18 and W19.



**Figure 18:** a. Looted Tomb W116, view to the southwest. The long sub-rectangular stone in the center is 2.05 m long. Megalithic slabs are generally 80-120 cm in maximum dimension. 18b. The basalt slab at lower left of looted W116 is coated with lime plaster (Photos: G. Rollefson)

#### 4. Discussion

More than 80% of the site of Wisad Pools is located on the plateau east of the 1.5 km long Wadi Wisad, and the density of the buildings is even much higher than west of the wadi. The other areas include a relatively large area that encompasses the majority of the Tower Tombs, including W601 and W602 (Figure 2b); south of this "sepulchral area" is a large cemetery made up of literally hundreds of small rock piles (c. 2.00 m diameter each and not higher than 50-60 cm), thrown together with no identifiable organization, and likely containing one or more people per cairn. These cairns are not included in the tally of buildings, by which is meant constructions that involve raising walls. Farther downstream (c. 350 m) is a sedimentary "island" on both sides of which the wadi continues to its mouth. The "island" is also a cemetery, although here the cairns are somewhat larger in area, but still without patterned orientation, suggesting that the cairns in both cemeteries are pre-Islamic.

In the southern half of the dominating eastern sector of the site, flood basalt that fractured into slabs appears to be more readily available than farther north, where the surface

is covered with coarser and geometrically chaotic volcanic "bombs" that rained onto the silt deposits (which themselves cover flood basalt). These irregular basalt stones were used for the construction of W400 (Figure 7). The difference in ground plans of LN structures in the northern and southern parts of the eastern section of Wisad may also be a function of the available building material: the small irregular pieces of volcanic material may have been more stable used for constructing a bay-like pattern than a broad circular arrangement of slabs such as used at W80.

The central pillars in the excavated LN structures did not support the probable superstructure of the buildings in view of their relative shortness. Working under a roof that was only a meter above the ground would have been difficult and uncomfortable, particularly with fires burning in the large hearths recorded at W80 (and at SS-1 at Mesa 7) and extensive ash deposits in W66. The presence of gazelle bones concentrated at the foot of the W80 central standing stone suggests that the pillar was associated with some ritual purpose instead.

Excavated structures at Wisad all date to the Late Neolithic, but there are also many post-Neolithic structures for which we have no hard data from Wisad with which to determine their age. Nevertheless, research in the western section of the Black Desert has provided a set of dates for different kinds of post-Neolithic architecture based on radiocarbon, human bioapatite and collagen, and OSL determinations (Akkermans and Brüning, 2020, Tables 1 and 2).

Akkermans and Brüning (2020, p. 204, Figure 19) describe structure QUR-1075 as an "apsidal ... tower tomb ... with [an] explicitly straight face oriented to the east", which precisely describes Wisad structures W19, W59, and W404. Structure QUR-1075 did not produce any absolute dates, but Akkermans and Brüning (2020, p. 204) suggest that apsidal Tower Tombs date to a period between 1150-800 BCE. One free-standing round Tower Tomb in the Qurma area was dated to the fourth millennium BCE (Akkermans and Brüning, 2020, p. 204), and from size comparisons, this might be applicable to Wisad tombs W110, W117, W118, W119, and W602, although it is also possible that they might date to the Iron Age. Tailed Tower Tombs in the Qurma area were "a momentous innovation of the first millennium BC ... [with] the attachment of a chain of small cairns ... up to 135 m in length" (Akkermans and Brüning, 2020, p. 205), and this fits with the "bull's-eye" ring tomb W85, Tower W601, and certainly Tower W13, the tail of which consists of 51 cenotaphs stretching over more than 100 m in length. It is interesting that both the bull's-eye tomb and three towers with cenotaphs occur at Wisad, although they probably were not used at the same time. It is likely that W13, whose tail changed

from piles of stone to a succession of chambers, is the youngest of these four burial monuments<sup>1</sup>.

Rectangular cist graves in the Qurma region mostly date to between 300 BCE to 200 CE, and this time range can probably be attributed to the cists W1-W4 and features in W6. This time range is commonly cited for the Safaitic period. The only convincing evidence of Safaitic presence at Wisad is at Towers W110, W117, and W119, so there may have been a different ethnic group in the region associated with the cist burials.

Field work dedicated to the Late Neolithic structures at Wisad Pools will resume in 2022, although future excavation will move to some of the later periods as well.

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1 The switch from piles to built chambers (54 in all) also occurred at Mesa 4 in the wadi al-Qattafi, suggesting that it might be contemporaneous with W13 at Wisad.