Excavation and OSL Dating of the Bedhat esh-Sha'ab Enclosure in the Jordan Valley

Shay Bar, Yael Jacobi, and Nofar Shamir

Abstract

The Bedhat esh-Sha'ab enclosure was discovered in the Jordan Valley by the Manasseh Hill Country Survey and excavated by Ben-Yosef. Its foundation was dated to the Iron Age I; it was interpreted as a tribal cultic gathering site, grouped with similar survey sites designated as “foot-shaped enclosures,” and identified by Zertal as one of the biblical Gilgal sites.

The renewed project at the site, which combines both ceramic and OSL dating, aims to date the construction of two of the site’s most prominent structures: the round unit U10 and the central courtyard. The ceramic and OSL results show that U10 was built in the Iron Age, probably in the time span between the later phases of the Iron Age I and Iron Age IIA. It remained in use until Iron Age IIB, slightly raising the possible dates for this structure. These results also indicate that, contra earlier suggestions, the main habitation phase of the central courtyard was in the Early Roman period. The new project proposes a more complex history for the site than had been posited in past investigations.

Keywords: foot-shaped enclosure, Iron Age, Jordan Valley, OSL

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Introduction

The Bedhat esh-Sha’ab enclosure was discovered in the Jordan Valley by the Manasseh Hill Country Survey (Zertal and Bar 2017: Site 65) and excavated by Ben-Yosef (2007; 2017). Its foundation was tentatively dated to the Iron Age I. It was interpreted as a tribal cultic gathering site, grouped with similar survey sites designated as “foot-shaped enclosures” (Fig. 1), and identified as one of the biblical Gilgal sites (Zertal 2021).

The site is a 1.2 ha (12 dunam) enclosure, 169 m long and 88 m wide, located near the modern village of Argaman (Israel Old Grid 1988/1742). It is surrounded by a 370 m-long wall built of medium-sized local stones. The southern part of the wall is wider, forming a stone-paved path. The enclosure contains two main structures: a large polygonal central courtyard (46x30 m; Area D) and a 6 m-wide round structure (U10; Area A) partly surrounded by a paved surface (Figs. 2–3). For a detailed description of the site, see Ben-Yosef 2017.

The site was poor in finds; it yielded 139 indicative Iron Age sherds, including the pottery from the survey. In addition, pottery not from Iron Age occupation periods was found at the site during the survey and in some of the excavated loci. This was due to shallow debris accumulation and the probable reuse of areas of the site in later periods. The overall pottery assemblage collected before the current project included 60% Iron Age I, 20% Iron Age II, 15% Roman-Byzantine, and 5% Early Muslim sherds. Dating was based only on the meager pottery, as no organic material was found that was suited to radiometric dating.

Elsewhere, we attempted to redate the site’s main features based on a detailed analysis of the results of the context and dating of the pottery from the earlier dig (Bar and Ben-Yosef 2021). However, the construction date of round structure U10 was not secure, only tentatively dated to the time span of Iron Age I–Iron Age IIA, and the central courtyard was not positively dated at all.

Therefore, we decided to excavate the site again in order to arrive at a more precise dating for the construction period of these two structures. This time, the
excavation was conducted in specific locations related to the two structures. We also employed OSL analysis to clarify the dating of both structures.

Figure 1: Location of Bedhat esh-Sha’ab and other “foot-shaped enclosures” (after Bar 2020: Fig. 1)
Figure 2: Plan of the excavations at Bedhat esh-Sha'ab (after Ben-Yosef 2017: Fig. B2)
Stratigraphy and Architecture

The 2020 excavation focused on the round structure U10 and the polygonal central courtyard Area D.

Round Structure U10

U10 was previously excavated by Ben-Yosef (2007; 2017) and was dated to the Iron Age I. It is situated in the northern part of the site, in Squares P–Q/8–9 (Fig. 2). Earlier research at the site claimed that it was a completely stone-filled, 6 m-wide round structure surrounded by a one-stone-wide wall (WU10; Fig. 4) built of large fieldstones. This wall survived to a height of 1 m (3 courses). The structure was partially surrounded by a rough stone pavement (F11004; Fig. 2) that abutted its
lowest course. The pottery of F11004 was mostly dated to the Iron Age I, with a few Iron Age II and Roman sherds; a probe below this floor yielded only Iron Age I sherds (Bar and Ben-Yosef 2021).

The round structure itself had not been probed during the earlier excavation, and its dating had been based on the excavation of features abutting it. Therefore, a decision was made to excavate the stone fill inside the structure in order to properly date its construction and try to decipher its masonry. Hence, the northeastern part of the structure was excavated (about 25% of the overall area of the structure) and OSL measurements were performed inside (see below).

The excavation of U10 yielded the following stratigraphic and architectonic results:

1. The surrounding wall WU10 is wider than previously thought and includes the newly exposed boulders of the well-built wall W41011. Wall W41011 comprises the inner row of stones of the surrounding wall, preserved up to two stones high. A header construction was used in the outer row of stones. The overall width of the surrounding wall varies between 1.1 and 1.6 m. Assuming that the entire structure was built with the same masonry, the inner fill of the structure was about 3.5 m in diameter.

2. The inner fill of the tower (L41006, L41008), bounded by wall W41011, is mostly composed of medium-sized stones. These are not the result of a collapse (significantly, no massive collapse was observed in the Ben-Yosef excavation outside the structure’s surrounding wall), but rather an organized fill. The fact that hardly any soil or archaeological material was deposited in the stone fill, and all the lowest stones were laid on the same horizontal soil surface (L41010), further supports this conclusion.

3. No alterations or modifications were noted in the limited area excavated. It seems that the entire construction process was carried out as a single operation in one chronological phase.

4. The excavation did not reach bedrock or sterile sediment. The presence of additional, earlier strata may only be verified by future probing below L41010.
The Central Courtyard
The central courtyard, Area D, is surrounded by Areas A, B, C, and E (Figs. 2–3). This polygonal closed unit is surrounded by a well-built 1 m-wide wall. It is 46×30 m and contains a flat, empty surface. Its western wall (W24010) is parallel to the enclosure wall W21024 (Area C) and stands at a distance of approximately 15 m from the latter wall. The previous excavators suggested that its two western corners abutted enclosure wall W25002 in Squares I/26 and G/17–18, asserting that the whole structure was designed and built at the same time (Iron Age I).

The surrounding stone wall consists of two rows of medium-sized stones with filling between them. A section in the western corner excavated by Ben-Yosef (2017: 679–680) revealed that this wall was laid in the same manner as the other walls of the site. However, in contrast to most of the other walls, it reaches a height of 1 m and creates a closed unit. Although most of the pottery retrieved here in the Ben-Yosef
dig was dated to the Iron Age I, a few Roman-period sherds were also found; that is, these loci were not completely clean, and the dating of the courtyard was not confirmed. The inner space of the courtyard is covered by eroded soil, and its use has not yet been determined.

In order to date the construction phase of the courtyard’s surrounding wall, we excavated its northwestern corner (Fig. 5) from the inside and outside (Squares H-I/17; Fig. 2). The adjacent northern part of Area E was also probed (Squares G-H/17-18; Fig. 2) on both sides of wall W25001. Several sub-phases were noted:

The main stratum exposed includes living surface L44002–3, which abuts courtyard walls W21031 and the newly exposed W44004. Wall W44004, one stone high, floats below Loci L44002–3 in Locus L44005. Another living surface, L45003, probably from the same sub-phase, abutted walls W14002 and W25001 in Area E to the west. These living surfaces were made of tamped soil and included flat-lying pottery. An entrance was found in wall W25001, adjacent and to the north of living surface L45003. This was the first time that living surfaces have been archaeologically linked to the courtyard walls and Area E architecture, and the dating of the finds on both surfaces completely revised earlier dating suggestions for this part of the site (see below).

It is clear that the courtyard walls here had at least two construction phases: an early phase (W21031 and W44004), and later additions with a filling of small stones between large boulders (upper layers of W14002). The earlier walls were dated by pottery and OSL. While the later addition was poorly dated, the fact that L45003 abuts its lower western courses supports a similar date to that of the earlier walls.

A possible clue for an earlier stratum is represented by wall W41009, which is partly sealed from the south below W21031. Unfortunately, we could not date it properly, as it was not abutted by any other feature. It may hail from the same stratum as W21031 and may have been a bench outside the courtyard or a support feature in the northern slope. However, it may also represent an earlier phase of activity buried below the later courtyard walls. At this stage of research, we cannot propose a clear answer to this question. It must be noted that only 5 m to the east of the eastern edge of the excavation area, Ben-Yosef excavated a better-preserved section, more than
1 m high, of W21031, the northern courtyard wall. Further excavation may reveal why the preservation here is not as good and why the dating of the features is so varied (see below).

Another important result of the renewed excavation is the discovery that W25001 of Area E does not abut the site’s perimeter wall W25002, as had previously been suggested.

![Figure 5: Aerial view of the excavation in the northwestern corner of the central courtyard (Photography: A. Lipkin)](image)

**The Pottery Assemblage of the 2020 Season**

Only 315 sherds were found in U10 and the northwestern part of Area D, including only nine indicative rims. This is typical of other poor nomadic or semi-nomadic enclosure sites in the region (see Ben-Shlomo and Hawkins 2017).
Pottery of Round Structure U10

Only 47 sherds were found in the probe inside U10. Twelve of these were irrelevant mixed body sherds found on the upper surface of the stony structure when cleaning above the highest stone course (L41001). The rest of the pottery was found inside the stony fill of the structure (L41006, 20 sherds; L41008, 5 sherds) and below it (L41010, 10 sherds). Apart from one Early Roman cooking pot with a triangular rim from the stony fill (Fig. 6: 5, paralleled at Masada [Bar-Nathan and Yadin 2006, Pl. 28] and Jericho [Bar-Nathan 2002, Pl. 12: 148–150] and dated between the end of the 1st century BCE and the 1st century CE) and two ribbed body sherds in the upper part of the collapse (L41006), the remaining 32 sherds were all Iron Age. In the deepest stone fill of U10 (L41010), a cooking pot was found with parallels in the time span between late Iron Age I and Iron Age IIB, usually more common in Iron Age IIA assemblages (Fig. 6: 1; Tappy 2015, Pl. 2.3.4: 6 [Samaria, Period I = Omri, 882–871 BCE], 7–8 [Far'ah (N), St. VIIb = 11th–10th century BCE]; Panitz-Cohen 2020, Figs. 24.31: 11.2:6 [Rehov St. J-5 = early 9th century BCE–840/830 BCE]; 24.32: 13.28:11 [Rehov St. C-2 = 10th century BCE]; Mazar 2020, Fig. 25.7: 9.26:10 [Rehov B-2 = late 8th–early 7th century BCE]). In the slightly higher L41006 was found an Iron Age IIB cooking pot (Fig. 6: 2; Tappy 2015, Pl. 2.3.5: 7 [Samaria, Tomb 207], 8 [Shechem, St. VII = 750–724 BCE], 9 [Samaria, Period VI]).

Pottery of the Central Courtyard

The probe in the northwestern corner of the Area D courtyard exposed 268 sherds. While only six indicative rims were found, the ribbed body sherds were prominent in every locus (about 80% of the total identifiable find), contrary to the results of the previous excavation in this area. Two living surfaces were found abutting the courtyard wall on the inside and outside (L44002–3 and L45003). In both cases, only ribbed sherds were found on the ancient floors.

In the living surface inside courtyard L44003 were found a Type M-BL1A incurved rim bowl (Fig. 6: 3, paralleled at Masada [Bar-Nathan and Yadin 2006, Pl. 25: 2, dating from the Hellenistic period to the 2nd century CE]) and a storage jar with a straight simple rim (Fig. 6: 8, paralleled at Jericho [Bar-Nathan 2002, Pl. 24:}
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397,406] and Masada [Bar-Nathan and Yadin 2006, Pl. 5: 21, dated to the 1st century CE]). In addition, in the makeup of this surface was found a cooking pot with a triangular rim (Fig. 6: 4, paralleled at Masada [Bar-Nathan and Yadin 2006, Pl. 28] and Jericho [Bar-Nathan 2002, Pl. 12: 148–150, dated to between the end of the 1st century BCE and the 1st century CE]).

In the living surface in Area E, L45003, were found two jugs (Fig. 6: 6–7) and a twisted handle. One jug had a rounded rim and a small ridge below the rim on the inner wall. The other was a cooking jug with a small ridge on the rectangular section rim (common in Jerusalem and Judea from the 1st century BCE to the 2nd century CE – Berlin 2005: 39). A large, broken ribbed vessel, probably a jar, was found on the surface, unfortunately without a rim or base. To the north of W25001 (L41004, not in a good context), was found the triangular rim of another cooking pot (Fig. 6: 9, same parallels as Fig. 6: 4–5 above).

The assemblage retrieved from the living surfaces exposed in the central courtyard and adjacent Area E suggests a date in the Early Roman period for the main occupation phase of this area, contra early dating suggestions for this structure.
Figure 6: The pottery assemblage from the 2020 excavation season
<table>
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<th>No.</th>
<th>Locus</th>
<th>Type</th>
<th>Description</th>
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<tr>
<td>1</td>
<td>41010</td>
<td>Cooking pot</td>
<td>Brown fabric, grey core, white and grey grits</td>
</tr>
<tr>
<td>2</td>
<td>41006</td>
<td>Cooking pot</td>
<td>Brown fabric, grey core, white and grey grits</td>
</tr>
<tr>
<td>3</td>
<td>44003</td>
<td>Bowl</td>
<td>Light brown fabric, groove below rim inside wall, 12 cm rim diameter</td>
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<tr>
<td>4</td>
<td>41005</td>
<td>Cooking pot</td>
<td>Orange fabric, red core, ridge on rim, 10 cm rim diameter</td>
</tr>
<tr>
<td>5</td>
<td>41008</td>
<td>Cooking pot</td>
<td>Red-brown fabric, ridge on rim, 10 cm rim diameter</td>
</tr>
<tr>
<td>6</td>
<td>41004</td>
<td>Cooking pot</td>
<td>Orange-reddish fabric, large ridge on shoulder, 9 cm rim diameter</td>
</tr>
<tr>
<td>7</td>
<td>44003</td>
<td>Jar</td>
<td>Light brown fabric, 8 cm rim diameter</td>
</tr>
<tr>
<td>8</td>
<td>45003</td>
<td>Jug</td>
<td>Pale yellow fabric, dark red core, 3 cm rim diameter</td>
</tr>
<tr>
<td>9</td>
<td>45003</td>
<td>Cooking jug</td>
<td>Red-brown fabric, 6 cm rim diameter</td>
</tr>
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**OSL Dating**

OSL is a dosimetric method that dates the last exposure of quartz grains to sunlight (Aitken 1998). In this method, the age is obtained by the ratio between the equivalent dose (De, the amount of radiation received by the grains in nature) and the dose rate (the total environmental radioactivity that produces the OSL signal). As the site was built on limestone terrain, all the quartz grains in the sediments associated with the walls must have been blown by the wind into the area over time. The OSL sampling strategy in the present research was dictated by the assumption that the silty-clayey dust that fills the interstices between the stones (and sometimes penetrates slightly below the stones) postdates the construction. Once the site was abandoned, the walls acted as dust traps, and sediment accumulated until all available spaces were filled. Dating of this sediment would produce a minimum age.

Samples for OSL dating were collected from two areas in the site: four samples from the round structure U10 (AGM-1, 2, 4, 5; Fig. 4: L41008) and two samples from the northeastern corner of the central courtyard (AGM-9, 10; Fig. 5: W21031).
Samples were collected by digging a small pit below or inside the stone wall (Fig. 7) to expose the relevant sediments, followed by horizontal sampling of the section between the stones of the wall. To avoid any exposure to sunlight, sampling was conducted under an opaque cover; sediments were collected with a trowel from the selected location and stored immediately in black, light-tight bags. A duplicate sample was collected from each sampling spot for dose rate evaluation.

Sample preparation and measurements were carried out under weak orange-red light at the Geological Survey of Israel (GSI)’s luminescence dating laboratory. In the laboratory, the 75–125 µm quartz grains were extracted from the samples using routine procedures (Faershtein et al. 2016). After wet sieving to the desired grain size, carbonates were dissolved using 8% HCl solution, and the samples were rinsed and dried. Magnetic separation with a current of 1.4 ampere on the magnet was used to further concentrate the quartz by removing heavy minerals and most feldspars (Porat 2006). The concentrated quartz fraction was etched with a 40% HF solution for 40 minutes to dissolve any remaining feldspars and remove the outer 10 µm of each grain affected by alpha particles. Finally, the grains were soaked overnight in 16% HCl to remove any fluorides that may have precipitated. The purity of the quartz was checked on three aliquots from each sample by measuring the post-infrared recycling ratio as in Duller (1994); no feldspar contamination was detected.

The De values for each sample were measured on 19 2-mm aliquots (about 200 grains placed at the center of the disc) using the SAR protocol and a Risø TL/OSL reader. The dose response curves were generated by exponential fitting. The samples have a relatively tight De distribution with low O-D values (Table 1). The average De values were calculated by means of the Central Age model (Galbraith and Roberts 2012), using essentially all measurements.

The duplicate samples for the assessment of the environmental dose rates were dried, crushed, and split, and about 50 g were powdered. Concentrations of the radioactive elements U, Th, and K were measured by inductively-coupled plasma optical emission spectrometry (ICP-OES) for K and ICP mass-spectrometry (ICP-MS) for U and Th (Table 1); time-averaged moisture content was estimated at
4–8%; and cosmic dose rates were evaluated from current burial depths following Prescott and Hutton (1994).

**Results**

The OSL ages from the studied sections (Table 1) range from ca. 4080±210 to 2060±80 years (before 2020, the year of measurement), or 2060±210 and 40±100 BCE, respectively.

The De values of most samples have a low scatter, with overdispersion (O-D) values of 6–13%, and their age reliably determines the time when the sediment was deposited. The tight distribution may also indicate a relatively high accumulation rate of sediment after the abandonment of the site. The De values of one sample, AGM-10 (from the northeastern corner of the central courtyard), are scattered, with an O-D value of 17%, indicating a range of time in which the grains were deposited and suggesting a heterogeneous depositional history.

The OSL age of Samples AGM-1 (from below the foundation of the structure), 2, and 4 (from the first layer of stones in the surrounding wall) of round structure U10 (800±100, 1010±110 and 840±120 BCE, respectively) revealed that sediments began to accumulate in the structure in the time span between the later phases of the Iron Age I and Iron Age IIA. The age of Sample AGM-5 (390±90 BCE) does not correspond with the ceramic data from the site and could indicate more complex depositional processes or a sampling error. The OSL age of Sample AGM-9 (40±80 BCE), from the northeastern corner of the central courtyard, revealed that the structure was buried and the sediments accumulated between the Late Hellenistic period and the Early Roman period. The OSL age of Sample AGM-10 (2060±210 BCE), likewise from the northeastern corner of the central courtyard, also revealed heterogeneous depositional histories at the site. This earlier age may be caused by sampling from the building foundations, located within older sediment from the Bronze Age.
Figure 7: OSL samples (blue circles) and ages (BCE) at the section across round structure U10 (Errors are given at 1σ [sigma])

Summary

The renewed project at the Bedhat esh-Sha’ab enclosure, which combines both ceramic and OSL dating, is aimed at dating the construction of two of the most prominent structures at the site: the round unit U10 and the central courtyard.

The ceramic and OSL results show that U10 was built in the Iron Age, probably in the time span between the later phases of the Iron Age I and Iron Age IIA, and was in use until Iron Age IIB. The new findings slightly raise the previous dates suggested for this structure (Iron Age I; Ben-Yosef 2017).

The ceramic and OSL results show that the main habitation phase of the central courtyard was in the Early Roman period (contra Ben-Yosef 2017, who suggested an Iron Age I date for this courtyard). Similar Roman period courtyards are common in eastern Samaria and the Jordan Valley; these were mainly used for keeping livestock and storing agricultural surpluses (e.g., Bar and Zertal 2021: 57).

The new project at the site suggests a more complex history for the site than had been posited in the past. A combination of the data from both excavations indicates
that the site was first inhabited in the Iron Age I and continued to function until the Iron Age IIB. Structure U10 was built during the later phases of Iron Age I or, more likely, in the Iron Age IIA. After a long occupational hiatus, the site functioned again as an agricultural courtyard in the Early Roman period.

Future excavations planned at the site and other foot-shaped enclosures in the region may further clarify the dating and function of these intriguing sites.

References


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<th>Sample</th>
<th>Depth (m)</th>
<th>K (%)</th>
<th>U (ppm)</th>
<th>Th (ppm)</th>
<th>Beta (Gy/a)</th>
<th>Gamma (Gy/a)</th>
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<th>Total Dose Rate (Gy/a)</th>
<th>N-O-D (%</th>
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</table>

Notes: Ages are in years before year of measurement (2020). Burial depth is from the top of the accumulated sediments.

Overdispersion, the scatter within the sample beyond what may be expected from analytical errors, average and errors of the De values were calculated using the Central Age model (Galbraith et al. 1999). O-D = overdispersion, the scatter within the sample beyond what may be expected from analytical errors.