FROM THE JORDAN VALLEY LOWLANDS TO THE TRANSJORDANIAN HIGHLANDS: PRELIMINARY REPORT OF THE WĀDĪ SHU‘AYB ARCHAEOLOGICAL SURVEY PROJECT 2017

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Introduction

The Wādī Shu‘ayb Archaeological Survey (WSAS) project was initiated in 2016 and focuses on a thorough survey and re-evaluation of all archaeological and historical sites in Wādī Shu‘ayb, ranging from the Neolithic period to the Ottoman period. The study area runs from immediately south of the city of as-Salṭ down to the city of South Shūnah (ash-Shūnah al-Janūbiyyah), located at the mouth of the *wadi* in the Jordan Valley. The second season in 2017 continued the ongoing survey of the *wadi* system. A further goal of the 2017 season was to conduct a thorough survey of the site of Tall Bulaybil (WS-007), which had been preliminarily surveyed in 2016 (Ahrens 2016b). This time, however, the focus was on extensive soil sampling for botanical analyses and radiocarbon dating. Thus, at five different locations on the northern flank of the *tall*, which features a (modern) collapsed section with stratified remains exposed *in situ*, soil samples were taken at different elevations. Additionally, many of these *loci* yielded charcoal remains that were also collected for analysis. Three samples submitted for radiocarbon dating give precise dates for the site, which has never been the focus of archaeological excavations. Aside from the work at Tall Bulaybil, the project also surveyed new areas of the *wadi* that hadn’t been examined in 2016. This led to the discovery of an additional 13 archaeological sites, nine of which were unknown hitherto. Altogether, the number of sites surveyed in the *wadi* has been raised to 27.

Wādī Shu‘ayb - Location and Previous Research

Wādī Shu‘ayb is one of the major routes connecting the southern part of the Jordan Valley (Jericho and South Shūnah) with the central Jordanian highlands (as-Salṭ), covering an altitudinal difference of approximately 1,000m over its length of 16km. While the upper reaches of Wādī Shu‘ayb consist of fertile soils watered by the perennial waters of the *wadi* and annual rainfall, its southern parts flow through dry terrain, finally merging with the Jordan River.

Given the importance of this *wadi*, it is surprising that only a few archaeological investigations have hitherto been conducted in the region. The area immediately south of as-Salṭ was preliminarily surveyed by R. de Vaux in 1937 (de Vaux 1938). At around the same time, N. Glueck surveyed several sites at the southernmost point of the *wadi*, here also referred to as “Wādī Nimrīn” (Glueck 1951: 366-371 [see also Sauer 1986]). In 1965, several sites in Wādī Shu‘ayb were briefly visited by R. Raikes (Raikes 1965). However, it wasn’t until 1988 that the region of Wādī Shu‘ayb between South Shūnah and as-Salṭ was subjected to preliminary archaeological survey, which was apparently not extended into further and more detailed surveys (Wright *et al.* 1989). Apart from these surveys, excavations were conducted in 1988-89 at the Neolithic site of “Wādī Shu‘ayb” about halfway between as-Salṭ and South Shūnah (summarized in Simmons *et al.* 2001), as well as at the site of

"Tall Nimrīn" in 1989-95, that site being located at the southern end of the *wadi*,within the limits of modern South Shūnah (summarized in Flanagan *et al*. 1996). In 2000, Ji and Lee surveyed several known sites in the region of the Wādī Shu'ayb / Wādī Nimrīn (including Tall Bulaybil and Tall Musṭaḥ) as part of their survey of Wādī al-Kafrayn (Ji and Lee 2002). Additionally, construction work for a sewage plant led to the discovery of Roman tombs in the *wadi* just south of as-Salṭ (Khirbat as-Sūq) in 1978 (Hadidi 1979).

The WSAS project was initiated in 2016 to document all archaeological remains in the *wadi* system, from the earliest periods attested until the Ottoman period, and from south of as-Salṭ to the Jordan Valley (for preliminary results see Ahrens 2016a, 2016b, 2018a, 2018b, 2018c; Ahrens and Rokitta-Krumnow 2017).

The Wādī Shu'ayb Archaeological Survey Project - Methodology

The aim of the project is to survey all archaeological sites within the aforementioned part of Wādī Shu'ayb in order to create a comprehensive dataset of *loci* of human activity. This is done with a non-invasive approach to on-site data acquisition: The project used a combination of architecture and landscape documentation using satellite and aerial imagery, as well as traditional survey methods (including a systematic description of all monuments and material assemblages and collections found) and detailed photographic documentation. Surface pottery and other finds were collected and recorded.

The traditional method for establishing such a dataset is by means of pedestrian survey during which extant traces of human activity are identified. Dating is done on the basis of chronologically diagnostic ceramic material, with the extent of activity being determined by its distribution. In order to achieve an up-to-date and comprehensive picture for the Wādī Shu'ayb region, archaeological sites known through survey or excavation were revisited to reassess their current state of preservation (damage assessment and monitoring). In so doing, a comprehensive list of Global Positioning System (GPS) coordinates for all sites surveyed - which was lacking so far - was also established.

The survey generally follows the course of Wādī Shu'ayb from directly south of the city of as-Salṭ (the northermost point) to the city of South Shūnah (the southernmost point). The *wadi* is scheduled to be surveyed out to 1,000 meters on each side, depending on geography as well as feasibility.

The project combines survey with small-scale, targeted excavation and soundings. With regard to this aim, especially at the site of Tall Bulaybil in the southern part of the *wadi*, the project focused on the implementation of a comprehensive soil-sampling programme for macro-botanical analyses and radiocarbon dating.

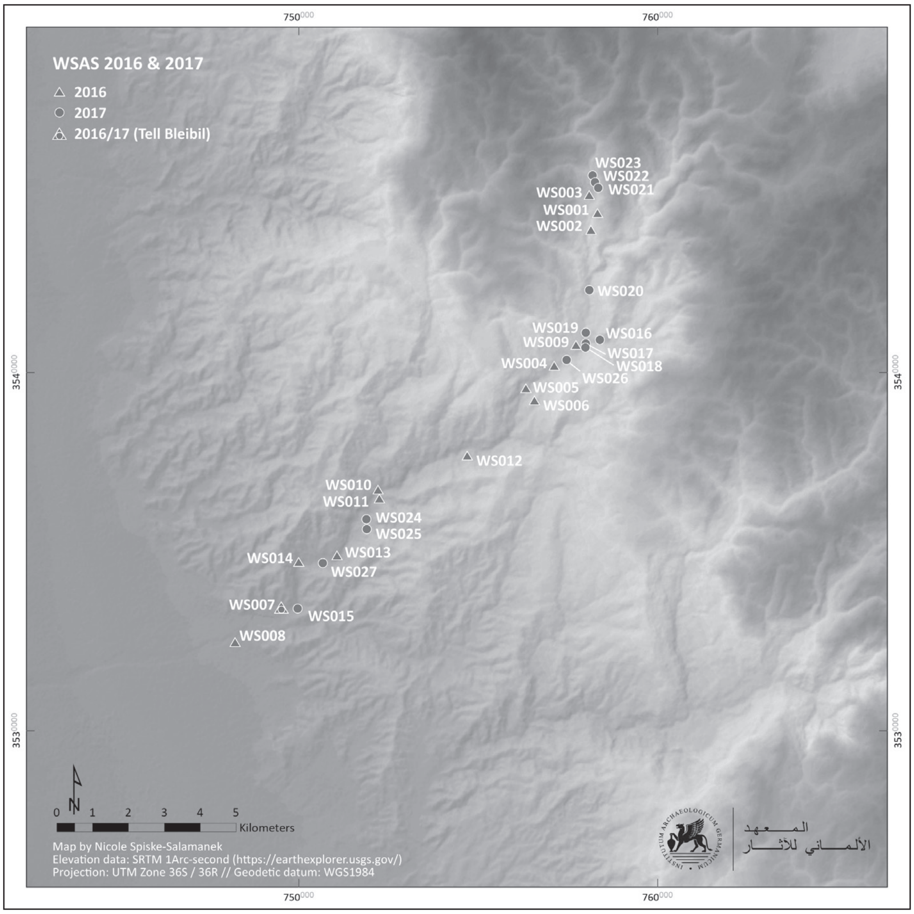
Results of the 2017 Survey Season

In total, 13 new sites - WS-015 to WS-027 - were surveyed during the project´s second survey season (**Fig. 1** and **Appendix 1** [for a list of sites surveyed in 2016 see Ahrens 2016b]), in addition to the archaeological work conducted at Tall Bulaybil (WS-007). The season lasted from 15 October to 12 November 2017. Detailed photographic documentation and damage assessment of these sites was carried out, as well as technical descriptions of specific archaeological features and the recording of correct GPS coordinates. Where present, diagnostic pottery was collected, recorded and drawn. A description of each site surveyed in 2017 is given below (WS =Wādī Shu'ayb + Site No. [the local name of the site, if extant and known, is given in brackets]).

In what follows, a preliminary description of each 2017 survey site is presented, along with additional information on diagnostic pottery and other details. As has been noted, soil samples for botanical and radiocarbon analyses were taken at Tall Bulaybil / WS-007 in 2017. The results of the radiocarbon analyses are presented below (**Appendix 2**).

WS-007 (Tall Bulaybil): Soil Samples and Radiocarbon Dating

Tall Bulaybil is a well-known site, located at the mouth of Wādī Shu'ayb (called "Wādī Nimrīn" in its southernmost part) on its northern bank. It overlooks the Jordan Valley and Wādī Juray'ah, which was surveyed by N. Glueck (visited by him in January 1943 [see Glueck

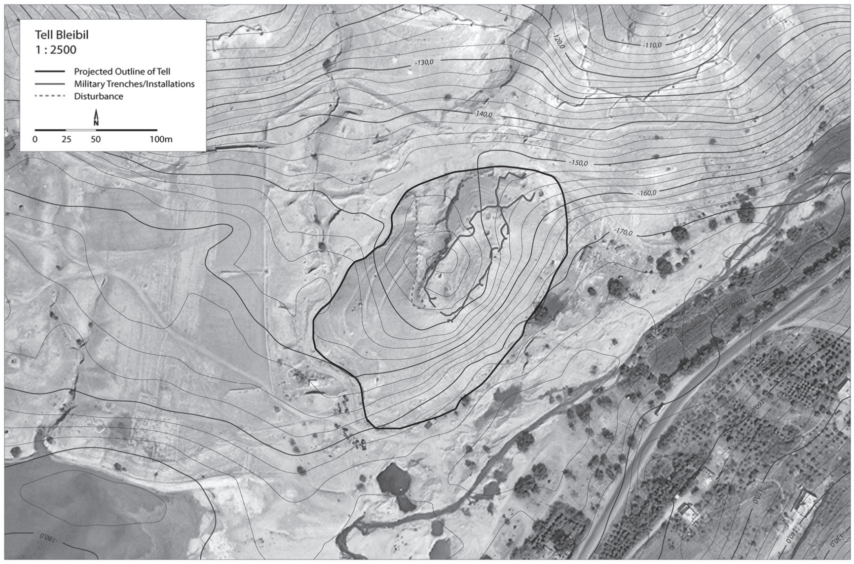


1. Map showing sites surveyed in 2016 and 2017 by the Wādī Shuʻayb Archaeological Survey project (map created by N. Spiske-Salamanek; map compiled by A. Ahrens, DAI, Orient Department, Damascus Branch).

1951]) as part of his survey of the Jordan Valley. Subsequent surveys in this part of the southern Jordan Valley have always included the site as well (*e.g.* Wright *et al.* 1989; recently Ji and Lee 2002), although excavations have thus far never been conducted. Tall Bulaybil was surveyed by the WSAS in 2016, and once again in 2017 (**Fig. 2**).

The site, which seems at least partly to rest on top of a rock outcrop, was occupied by an army outpost until the 1990s. Tall Bulaybil is to be identified with Wright's "Site No. 1" (Wright *et al.* 1989). The summit was completely bulldozed by military activities and thus does not display any archaeological remains today. However, military activity and the subsequent abandonment of these installations have led to the partial collapse of the northern flank of the *tell*, which was in turn apparently the focus of illegal bulldozing. This exposed a large section of the older periods of the site, which feature a massive mudbrick wall - partially burned secondarily - resting on a stone foundation (**Figs. 3 and 4**). Several floor levels and ashy layers are clearly visible in this section.

An important find of the 2016 season was the discovery at Tall Bulaybil of a fragment of distinctive Cypriote White Slip II Ware. The area around the site has hitherto been thought to be almost devoid of Late Bronze Age occupation, except for a short-lived settlement at Tall as-Sultan / Jericho during the 14th century BC and a few Late Bronze Age remains exposed recently at nearby Tall al-Ḥammām (Sauer 1986; Langgut *et al.* 2014; Collins *et al.* 2015). This may close the apparent gap in occupation of the region, since Tall Nimrīn / WS-008 (located *ca* 1,500m south-west of Tall Bulaybil [see below]) features Middle Bronze Age IIB occupation, followed by Iron Age remains with a hiatus between these two periods. Tall Bulaybil itself was thought to feature Early Bronze Age remains, followed directly by those of the Iron Age. The discovery of White Slip II Ware may alter this picture to some degree (see Ahrens 2016a: 140, fig. 10, 2016b: fig. 20), although it remains unclear whether or not an actual settlement existed during this period



2. Tall Bulaybil / WS-007 located north of alluvial fan of Wādī Shu'ayb (site map created by N. Spiske-Salamanek; map information compiled by A. Ahrens, DAI, Orient Department, Damascus Branch).

(see below). During the 2017 survey season, a fragment of a pinched ledge handle belonging to an Early Bronze Age II–III vessel was found (for parallels from sites in the vicinity, see Collins *et al.* 2015: 68, pl. 39 [EB II], 98, pl. 66 [EB III] re. Tall al-Ḥammām; Kenyon and Holland 1983: figs. 96-98 [EB II] re. Tall as-Sultan / Jericho), thus attesting to utilisation of the site at this time (**Fig. 5**). Diagnostic Early Bronze Age sherds were apparently also found by Ji and Lee during their visit to the site (Ji and Lee 2002: 187). In the immediate vicinity, the Early Bronze Age is apparently also at Tall al-Musṭaḥ, just south of Tall Bulaybil (see Yassine *et al.* 1988: 195 [EB I-III]; Ji and Lee 2002: 191-192), while at Tall Nimrīn the earliest levels seem to date to the Early Bronze Age IV (Dornemann 1990: 164; Flanagan *et al.* 1992: 90).

A primary goal of the project during its second season was thus to conduct a thorough survey of the site, especially its northern flank, with a focus on extensive soil sampling for botanical analyses and radiocarbon dating. Thus, at five locations along the northern side

3. Collapsed northern flank of Tall Bulaybil (photo: A. Ahrens).

4. Mudbrick wall with stone foundation protruding from collapsed northern section at Tall Bulaybil (photo: A. Ahrens).

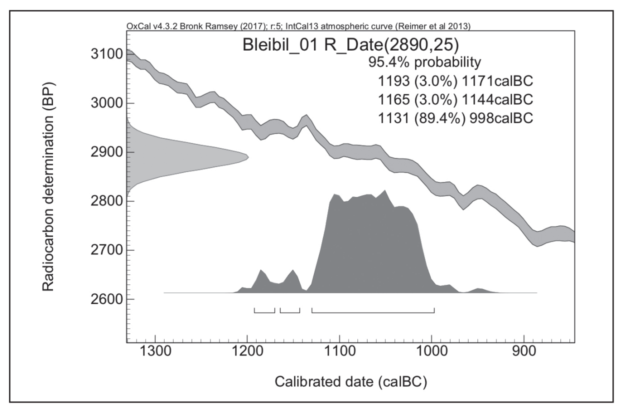
5. *Early Bronze Age II-III ledge-handle fragment from Tall Bulaybil (photo: A. Ahrens).*

of the *tell*, where the aforementioned stratified remains were exposed *in situ*, soil samples were taken at different elevations (**Figs. 6 and 7**). As noted, many of these *loci* also featured charcoal remains that were also collected. These samples give, for the first time, good dates for the main occupational levels at the site, which has never been the focus of archaeological excavation.

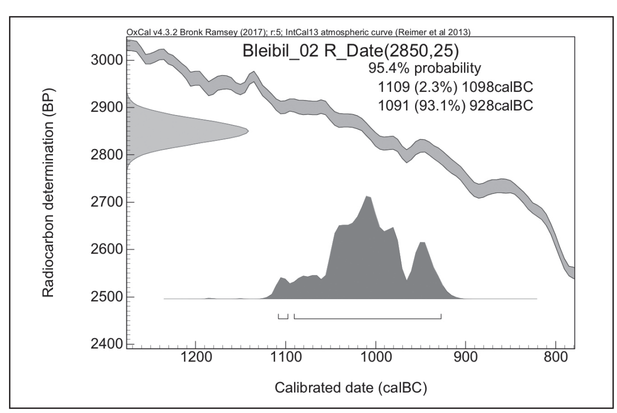
Radiocarbon analysis of three of these samples, all based on short-lived botanical remains (barley [*Hordeum vulgare*]), show that the main occupational levels date to the Iron Age (Iron Age IIA/B [these designations here understood and used only as general chronological designations and estimations]). The oldest layers are accessible in the area of the northern flank - where they rest directly upon *wadi*-worn rocks and cobbles - and date from the late Iron Age I (Iron Age IB-C) to early Iron Age IIA transitional period (**Fig. 8**). The second sample comes from the area of the mudbrick wall, which dates to the Iron Age IIA period (**Fig. 9**). The third sample, taken from a layer above the mudbrick wall, unfortunately falls into the so-called 'Hallstatt Plateau'. which refers to a consistently flat area on the calibration charts. This hampers accurate dating of the sample, although one might argue for a date range within the Iron Age IIB/C for the levels above the mudbrick wall (**Fig. 10**). Radiocarbon dates of around 2,450BP always calibrate to *ca* 800-400BC, regardless of their precision (see Manning *et al.* 2018 for problems inherent in the dataset used for the

6. *Taking botanical samples from northern section at Tall Bulaybil (photo: A. Ahrens).*

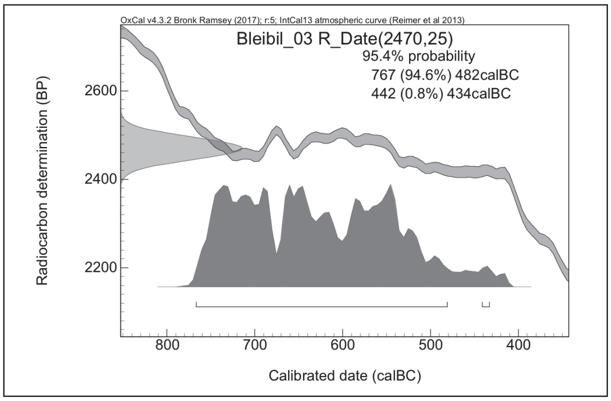
7. *Various soil and ash layers in earliest levels in northern section at Tall Bulaybil, sample Bulaybil_01 (photo: A. Ahrens).*



8. *Calibrated date of sample Bulaybil _01 from lowest level of collapsed northern section at Tall Bulaybil.*



9. *Calibrated date of sample Bulaybil _02 from level of mudbrick wall.*



10. Calibrated date of sample Bulaybil _03 from above mudbrick wall.

southern Levant). In general, these radiocarbon samples seem to demonstrate that Tall Bulaybil was inhabited concurrently with nearby Tall Nimrīn for much of the Iron Age (Flanagan *et al.* 1996: 277-281), but not with Tall al-Musṭaḥ which was apparently unoccupied at this time (Yassine *et al.* 1988: 197-198; Ji and Lee 2002: 191-192).

As is evident from the calibrated dates of these samples, Early and Late Bronze Age layers were not encountered, contrary to the pottery evidence. This could, however, reflect the possibility that any settlement dating to these periods was significantly smaller and may thus be covered by the remains of later periods. Alternatively, squatter occupation - especially in the Late Bronze Age - could also be possible (but see Sauer 1986; Ji 1997). The southern Jordan Valley seems to have experienced an extremely dry period during the end of the Late Bronze Age - Iron Age I transition, perhaps explaining the dearth of settlement activity in this region (Langgut *et al.* 2014).

Additionally, several architectural features visible along the southern slope of the *tell*, previously noted by Glueck (1951: 370-371) and Ji and Lee (2002: 187), were recorded in greater detail than previously. These apparently belong to one (or more?) massive fortification system(s) attested over the entire flanks of the *tell* (**Fig. 11**). Since no diagnostic pottery was found in secure association with these fortifications, they cannot as yet be attributed to a specific period. Additionally, given the various modifications and alterations visible on the ground surface, the fortification system could have been in use over a long period of time.

At the bottom of the western flank of the *tell* - and apparently not related to the fortifications - stone foundations were found which seem to date to an even later period. It is not clear whether these stone foundations date to the last occupational period of the site or to even later, *i.e.* Ottoman, times, since no diagnostic pottery found in association with them. There is no immediate threat to Tall Bulaybil at the moment, but several small looting pits were visible when the site was visited by the WSAS in 2016 and 2017. The large section on the northern flank of the *tell* may however continue to collapse. This flank would therefore seem to justify more detailed archaeological exploration, a task that is planned for the coming years.

WS-015

This findspot consists of two sockets (so-called 'cupmarks') chiseled out of a flat rock outcrop *ca* 15 meters high, immediately south of the modern road leading to the Jordan Valley (**Fig. 12**). Such installations are commonly

11. Fortification system along southern flank of Tall Bulaybil (photo: A. Ahrens).

12. Site WS-015, two sockets (cupmarks) carved into bedrock; probably used for oil- or wine-press installations (photo: A. Ahrens).

associated with wine or olive-oil presses, but other installations related to such activities or industries were not found at the site (see Zerbini 2015 for further literature on this topic). However, a group of natural rock crevices and caves is situated in the immediate vicinity of the sockets, so it may be postulated that these were used in conjunction with them (**Fig. 13**). The caves are used as modern animal shelters. No pottery was found at the site.

WS-016

This site consists of an Ottoman building complex. According to a local resident living nearby, it was built *ca* 150 years ago and abandoned *ca* 40 years ago when the last inhabitant died. The building complex consists of a main building with five rooms, with an adjacent courtyard and separate row of at least three rooms. These may have served as storerooms, magazines *etc.*, and perhaps also as a toilet (**Figs. 14 and 15**).

Located immediately next to this complex is a modern concrete building built in the 1980s. This belonged to the son of the last inhabitant, who left the site when his father passed away. The roof of the Ottoman house complex has collapsed in the meantime, having consisted of wooden beams. Many rooms of the main building exhibit large looting pits. No finds were recovered at the site.

WS-017

WS-017 is located on top of a flat rock outcrop towering over the confluence of Wādī al-Azraq with Wādī Shu'ayb. The entire site has been flattened and cleared of larger stones by heavy machinery. Today it is used as an agricultural field; such archaeological remains that may once have existed here appear to have been largely destroyed (**Figs. 16-18**). Pottery, however, is found scattered within the field and several looting pits are visible along the sides of the plateau, where larger stone walls are still visible (**Fig. 19**). The pottery assemblage dates primarily to the Roman-Byzantine periods, but there are also a small number of Iron Age II sherds within this corpus, likely attesting to an earlier occupation. It's interesting to note that the site has direct line-of-sight intervisibility with Khirbat Shu'ayb / WS-006 to the south

13. Site WS-015, natural caves near press installations (photo: A. Ahrens).

14. Site WS-016, Ottoman building complex (photo: A. Ahrens).

15. Site WS-016, door inside Ottoman building complex (photo: A. Ahrens).

(see Ahrens 2016a, 2016b; also below). It remains unclear, however, whether WS-017 was connected to WS-019 or should be considered a separate site (see below).

WS-018

Just south of WS-017, located directly at the confluence of Wādī al-Azraq with Wādī Shu‘ayb, are the remains of a disused Ottoman water mill (**Figs. 20 and 21**). The fragmented substructures stand as high as 6m in some parts, with some structural elements being secondarily used for modern agricultural activities. No pottery was recovered at the site.

WS-019

Located to the north-east of sites WS-017 and WS-018, further up the aforementioned

16. Site WS-017, seen from the west, during spring; WS-016 can be seen in the background (photo: A. Ahrens [taken in March 2016]).

17. Site WS-017, flattened summit used for agriculture (photo: A. Ahrens).

19. Site WS-017, looting pit next to stone wall south of summit (photo: A. Ahrens).

18. Site WS-017, confluence of Wādī al-Azraq and Wādī Shu‘ayb just south of the site (photo: A. Ahrens).

20. Site WS-018, Ottoman water mill (photo: A. Ahrens).

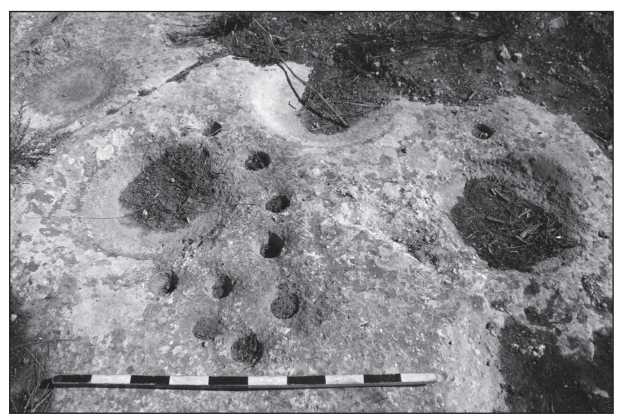
rock outcrop, is yet another site: WS-019. This may have been connected to WS-017 in some way or was perhaps even part of the same settlement. Having said that, a direct connection is not attested, despite a similar and partially overlapping pottery assemblage.

At WS-019, the remains of several rock-cut wine- or oil-press installations are located within what appears to be a production area (**Figs. 22 and 23**). This is separated from a single house complex to the north by a stone wall (Zerbini 2015). The building complex measures *ca* 10×10m and originally consisted of approximately four rooms (**Fig. 24**). The internal layout of this building or exact number of rooms cannot be determined, since the interior is almost completely destroyed by looting pits. The entire site has been encroached upon by agricultural activity from all sides and has been thoroughly looted. Several cisterns are visible, albeit partly collapsed or destroyed by looters. Diagnostic pottery seems to date to the (late) Roman, Byzantine and Mediaeval Islamic (Mamluk) periods.

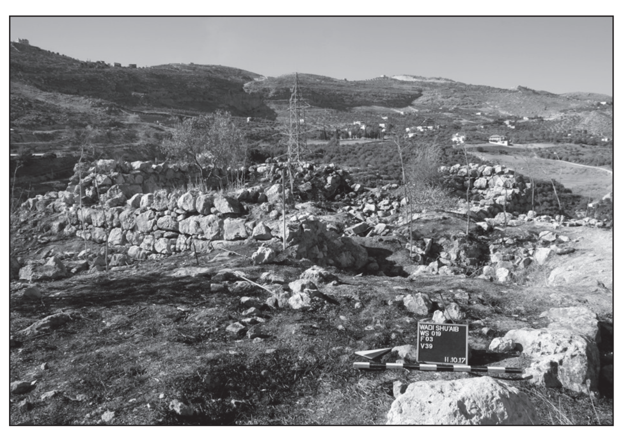
It is interesting to note that sites WS-001 and WS-002 to the north, as well as WS-006 to the south (surveyed in 2016 [see Ahrens 2016a, 2016b]), all have direct line-of-sight intervisibility with WS-019. The latter site may have functioned as a production complex for wine or oil (as a rural farmstead) - just like site WS-001 - but may also have functioned as a watchtower owing to its strategic location.

21. *Site WS-018, detail of Ottoman water mill (photo: A. Ahrens).*

22. *Site WS-019, oil- or wine-press installations (photo: A. Ahrens).*



23. *Site WS-019, oil- or wine-press installations (photo: A. Ahrens).*



24. *Site WS-019, building complex (photo: A. Ahrens).*

WS-020

Located directly at the spring of ‘Ayn al-Buqūriyyah within Wādī Shu‘ayb are the remains of another Ottoman water mill, which is no longer in use (**Figs. 25 and 26**). Its fragmented structures, comparable in construction technique to WS-018 (see above) and WS-022 (see below), stand as high as 6m with a length of *ca* 12m. In general, this water mill is much better preserved than WS-018, since it is today located within fenced-off private property next to a guarded water facility. For now, it would appear to face no serious threat. No pottery could be recovered.

25. Site WS-020, Ottoman water mill (photo: A. Ahrens).

26. Site WS-020, stone walls of Ottoman water mill (photo: A. Ahrens).

WS-021

This site represents the remains of a multiple rock tomb (probably Roman-Byzantine in date) on the left bank of Wādī Shu‘ayb, just opposite the large archaeological site of Khirbat as-Sūq which dates to the same period (WS-003 [surveyed in 2016; see Ahrens 2016b]). The tomb has been partly used as an animal shelter, with modern concrete walls erected within it, but faces no immediate threat (**Fig. 27**). No pottery could be recovered. The tomb is probably that designated “Site No. 9” by Wright *et al.* (1989).

WS-022

Located north of Khirbat as-Sūq, at the right bank of Wādī Shu‘ayb, are the remains of another Ottoman water mill, likewise disused (**Fig. 28**). The structures, comparable in construction technique to WS-018 and WS-020, stand as high as 5m. The location is a favourite picnic spot for the local community, so no pottery could be recovered. The site is probably that designated “Site No. 10” by Wright *et al.* (1989).

WS-023

This site represents the ruins of an Ottoman house, of which only the northern part - the *iwan* - is still standing (**Fig. 29**). The rest of the complex was apparently entirely destroyed and is now part of an olive tree plantation. No pottery could be recovered. The site is probably that designated “Site No. 7” by Wright *et al.* (1989).

27. Site WS-021, Roman-Byzantine tomb (photo: A. Ahrens).

WS-024

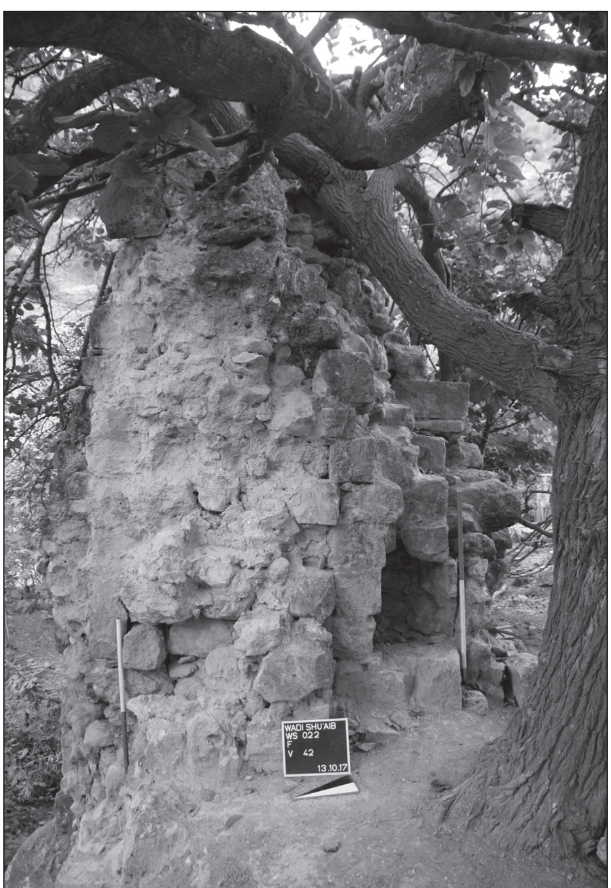
Roman-Byzantine watchtower built on an isolated rock outcrop. The site features good views into the *wadi* and clear line-of-sight intervisibility with sites WS-011 (surveyed in 2016 [see Ahrens 2016b]) to the north and site WS-027 to the south (see below). The tower itself measures *ca* 7×7m (**Fig. 30**).

WS-025

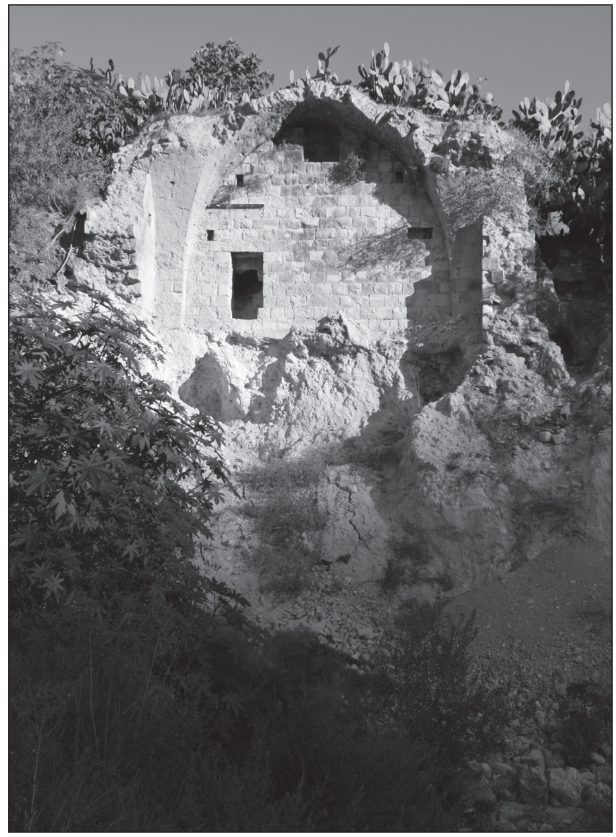
WS-025 is a structure of unclear function and date, which has also been re-used in recent times. The pottery collected around the site may however be older, possibly Roman-Byzantine, although it is not clear whether it was originally associated with this structure or was brought there from elsewhere (**Fig. 31**).

WS-026

Ruin of Roman-Byzantine, and perhaps also Islamic, date, with unknown extent. The site has been completely destroyed by a modern house and surrounding olive tree plantations.



28. Site WS-022, Ottoman water mill (photo: A. Ahrens).



29. Site WS-023, remains of Ottoman building (photo: A. Ahrens).

30. Site WS-024, remains of watchtower (photo: A. Ahrens).

31. Site WS-025, remains of stone structure of unknown date (photo: A. Ahrens).

Only pottery could be retrieved. A large number of worked and unworked stones found in the vicinity of the house may originate from older buildings which stood where the modern house is now located (**Figs. 32 and 33**).

WS-027

Remains of a Roman-Byzantine watchtower built on a rock outcrop; the site offers a direct line-of-sight intervisibility with site WS-024 to the north (**Figs. 34 and 35**). The watchtower was largely destroyed and covered by the foundations of an Ottoman house complex, which was (later?) used as a military complex. Since the watchtower exhibits a slightly different orientation and is also different in building technique, it can be clearly differentiated from the more recent Ottoman complex.

Addendum to Site WS-010 (Khirbat Jisr al-ʻIrāqiyyīn)

WS-010, which was examined in the first survey season (see Ahrens 2016b [also Ahrens and Rokitta-Krumnow 2017: 39-41]), was identified with the site referred to by Raikes as a '*tell* site' (Raikes 1965: 165, fig. 1). While WS-010 clearly resembles a '*tell* site' in general appearance, and clearly features multiple chronological and stratigraphic phases, it is not clear whether or not it may actually be considered a *tell* in the true sense of the word. As well as according with the approximate position of the site given by Raikes on his sketch map, the lithic material retrieved by him resembles that found at the site during the 2016 survey. An identification of the site visited by Raikes and WS-010 thus seems highly likely. In 2017, the APAAME project directed by D.L. Kennedy and R. Bewley took aerial photos of the site, one of which is reproduced here courtesy of that project (**Fig. 36**).

Addendum to Site WS-006 (Khirbat Shuʻayb)

WS-006, also surveyed in the first season (see Ahrens 2016b), was revisited in 2017. As noted in the first survey report, the site has yielded number of diagnostic Iron Age diagnostic sherds, along with later material. Several wall structures were recorded (**Figs. 37 and 38**). In 2017, the APAAME project took aerial photos

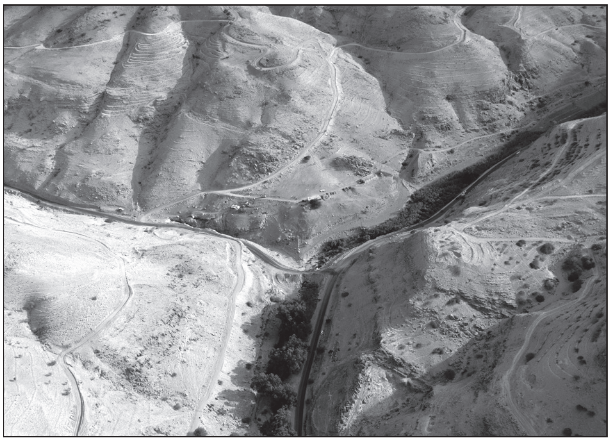
32. Site WS-026, remains of destroyed site (photo: A. Ahrens).

34. Site WS-027, remains of watchtower (photo: A. Ahrens).

33. Site WS-026, removed stones probably belonging to structures at the site (photo: A. Ahrens).

35. Site WS-027, watchtower seen from the north (photo: A. Ahrens).

of the site, two of which are reproduced here courtesy of that project (**Figs. 39 and 40**). These photos clearly show how the site offers striking views, both into the Jordan Valley to the south and up to the Transjordanian plateau in the direction of as-Salṭ to the north. Its situation in the middle of Wādī Shu‘ayb, atop a flat rock



36. Site WS-010 in center of aerial photo, with site WS-011 on rock summit south-east of WS-010 (photo: M. Dalton, APAAME).

37. Site WS-006 / Khirbat Shu‘ayb, stone foundations (photo: A. Ahrens).

38. Site WS-006 / Khirbat Shu‘ayb, stone foundations (photo: A. Ahrens).

39. Site WS-006 / Khirbat Shu‘ayb, seen from the north-west (photo: R. Bewley, APAAME).

40. Site WS-006 / Khirbat Shu‘ayb, seen from the south towards as-Salṭ and the Transjordanian highlands (photo: R. Bewley, APAAME).

outcrop overlooking the course of the *wadi*, is suggestive of probable defensive use.

Conclusions and Future Prospects

The second, 2017 season of the WSAS project has continued to show that its study area offers great potential for the investigation of nearly all periods of Jordanian history, from the Neolithic to the Ottoman.

In future survey seasons, it is planned to study the region in more detail and to add additional archaeological sites to the list of those surveyed in 2016 and 2017. To complement the picture, southern parts of Wādī al-Azraq and Wādī al-Kafrāt, which flow into Wādī Shu‘ayb south of as-Salṭ, will also need to be examined.

Additionally, the radiocarbon dates obtained from the collapsed northern flank of Tall Bulaybil (WS-007) would seem to justify more detailed archaeological exploration of this site in particular, which is planned for forthcoming seasons.

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Appendix 1: Gazetteer of Sites Surveyed in 2017

Site Number	Local Site Name	Altitude (MSL)
WS-015	Name unknown	-137 m
WS-016	Name unknown	+369 m
WS-017	Name unknown	+368 m
WS-018	Name unknown	+342 m
WS-019	Name unknown	+414 m
WS-020	Name unknown	+404 m
WS-021	Name unknown	+621 m
WS-022	Name unknown	+615 m
WS-023	Name unknown	+630 m
WS-024	Name unknown	+18 m
WS-025	Name unknown	-9 m
WS-026	Name unknown	+344 m
WS-027	Name unknown	-73 m

Appendix 2: Radiocarbon Analysis; Uncalibrated AMS Dates from Tall Bulaybil

UGAMS#	Sample ID	Material	δ13C, ‰	14C Age Years, BP	±	pMC	±
33914	Bulaybil_01 (WSAS_17_S_02_A)	plant frag.	-23.00	2890	25	69.75	0.20
33913	Bulaybil _02 (WSAS_17_S_01_F)	plant frag.	-24.13	2850	25	70.13	0.21
33915	Bulaybil _03 (WSAS_17_S_06_D)	plant frag.	-22.22	2470	25	73.49	0.22

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