

## GHAWR AṢ ṢĀFĪ EXCAVATIONS 2017 – 2018

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Conclusive archaeological excavations were conducted in the GHawr Aṣ Ṣāfī by the Hellenic Society for Near Eastern Studies (HSNES) in collaboration with the Department of Antiquities of Jordan (DoAJ) during 2017 and 2018. The project was also supported by the Palestine Exploration Fund (PEF) and the al-Hima Foundation (AHF).

### **Area TeS (Maṣna‘ As Sukkar, formerly Tawāhīn As Sukkar)**

The primary objective for the 2017 and 2018 seasons of excavation in Maṣna‘ As Sukkar was to uncover the channels first revealed in 2016 leading to the sugar refining areas involving boiling and curing of the pressed sugar juices (Politis 2021). These were presumed to be located immediately north-east of the pressing chambers, as was indicated by the flow direction of the conduits. The discoveries surpassed our expectations.

### *Trench TeS.XXII*

Excavations began by establishing an extensive new trench initially measuring 8 metres (E-W) × 23m (N-S) in order to have a large "catchment" area. By the end of the work it was expanded to 11 × 27m encompassing a large part of the sugar factory as well as walls from the early 20<sup>th</sup> century Ottoman fort.

Most of the deposits were wind-blown sands from the immediate proximity of the Wādī Al Ḥasā. Although removing these was laborious, it was a fairly straight-forward procedure. Few finds were recovered in these upper layers, primarily including datable

inscribed cartridge shells from the 1917-1918 skirmishes between the Ottoman Army and the Great Arab Revolt forces (Politis 2017). There were however, also some cartridges from the 1970 hostilities during the Israeli invasion of the GHawr Aṣ Ṣāfī. Related finds were also made in various areas of the site in 2016 and during previous seasons of excavations.

Of the Ottoman-period structures, the main N-S adobe brick wall was fully uncovered, exposing an unknown threshold/eastern entrance into the police post. It was also clear that this Ottoman wall was built on top of and in the same alignment as the earlier sugar factory wall. The early 20<sup>th</sup> century adobe-built wall had therefore used the 15<sup>th</sup> century adobe-built wall as a base. This was easily distinguished by a different brick colour, indicating a different source of earth. The Ottoman bricks were made of greyish soil and the earlier bricks below of an orange-yellow soil. The bricks also had different dimensions.

While exposing more of Trench XXII, a series of well-hewn sandstone blocks were found also in an N-S alignment. These however did not belong to a parallel wall, but as it turned -out, collapsed arches. Six sets of arch springers were revealed with a few stones still *in situ*. (**Fig. 1**) These formed part of an arcade that at the northern end was matched by another set of N-S running arches. Their depths were not fully exposed but at one place a column with its capital was found *in situ*. Although most of the arches were collapsed, they were numbered in sequence in order to enable future resurrections.

Four stones steps and a dozen pavers leading



1. Arch stub remnants of sugar processing area (TeS.XXII) of Magna 'As Sukkar from north. (K. D. Politis).

eastwards were the access point to the collection vat. In turn, they led to an area with rectangular adobe brick made rooms. These were filled with many semi-complete and broken sugar pots, allowing us to infer that it was in these vessels that the boiled sugar juices were left to cure and crystallise. In a corner of the southern room was a disarticulated female burial (upset by later Ottoman building activities) with beads and a multi-coloured glass bangle dating to the 15<sup>th</sup> century AD. This was similar to burials found in other parts of the sugar factory and gives it a *terminus post quem*.

Further east, fired brick-lined circular concave structures were found, their tops measuring 1.4m and 1.1m in diameter respectively, and approximately 1.5m deep found which were evidently where the copper cauldrons (*dusut*) were placed to boil the pressed sugar juice.

Immediately east of these was a collapsed adobe brick wall. This was carefully excavated, documented and left *in situ* as it covered the area of the stoke rooms. East of this were thick piles of dumped ash marking the outer limit of the sugar processing area.

Much of this area had remnants of plastered flooring and in places what look like plastered benches, perhaps for placing sugar pots or vessels related to the sugar refining process. Many sugar pot fragments (mostly of lower "molasses pots") were recovered during excavations of the area. Several fragments of copper vessels, probably from disused cauldrons were also found. Otherwise, few other finds were discovered.

### *Trench TeS.XXIII*

Sometime before 1997 tomb-robbers had come across an underground channel part of which had collapsed. This was consequently investigated and photographed (Politis 2013: 472, fig. 6). It was then assumed to be a long water channel for the water force that was employed to power the gearing mechanism of the sugarcane presses.

It was decided to relocate the channel by opening a 6m excavation trench (TeS.XXIII) on the west side of the main southern building. At a depth of less than one metre, a well-built E-W running stone wall that continued the entire length of the trench (and indeed beyond) was discovered. Descending another 2.3m, very tightly packed cobble-sized stones were found. After the removal of very few of these stones, it was evident that these formed part of the upper corbelling of the water channel. Initial photographs were taken by manually extending a small camera into the hole in the corbelled ceiling to give an indication of what lay below. It was in fact the water channel first identified in 1997.

More cobblestones were removed enabling a person to descend into the water channel in order to take better photographs and the surveyor to measure the dimensions and depth. The channel was more than 1.5m wide and, about 2m deep, and was plastered on its lower part. Looking southwards, a collapsed opening was identified as that which was discovered in 1997, completing the objectives for this work.

## Conclusions

A main focus of the final seasons' work was to reveal more of the functioning of the sugar factory, the Maṣna' As Sukkar, in the north-eastern areas of the site. This was where the actual sugar processing, boiling and curing took place. Covered conduits with lead piping channelled the pressed sugar juices to the first collecting vats. Then it was transferred to plastered bins where additives could be mixed-in before boiling in large copper cauldrons over furnaces, twelve of which were discovered. This reduced the sugar juices into thick syrup and was followed by pouring it into specially-made perforated pottery cones sitting on molasses jars in order to form crystallised sugar. Dozens of these pots were found set into hydrated lime plastered surfaces and bins, presumably in order to keep them as clean as possible for edible products.

This area must have had a cover apparently supported by two parallel rows of six pointed arches forming an arcade. As the western arcade was higher than the eastern one, the roofing would have sloped towards the east. Careful documentation was made once these features were uncovered by overhead photography. (Fig. 2)

During the latter part of 2018 until the beginning of 2019 conservation and preservation works of the Maṣna' As Sukkar were made possible with a grant from the American Institute of Archaeology in partnership with Hilton Worldwide. This facilitated accurate structural reconstruction by an expert conservation architect in collaboration with locally trained workers. A wooden frame was constructed to support the resurrection of the pointed arches. (Fig. 3) This will enable the support of a shelter above the curing area of the sugar factory to be protected and visible to visitors.

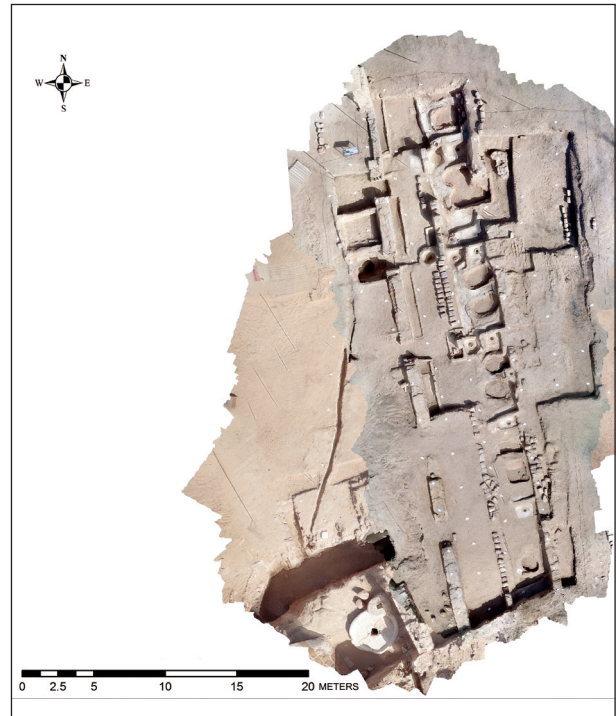
New information site signs were made by a local iron monger and pathways were extended by continuing the previous practice of using wooden pallets embedded in the sandy surface of the site. (Fig. 4)

## Area KSI (KHirbat Ash SHaykh 'Isā)

Excavations begun in 2015 in Trenches KSI. IX and KSI.X were concluded by 2018.

There we dug from top to bottom, Ayyubid

- Mamluk, Abbasid and Byzantine periods. All these had finds which well represented each of the periods, so the stratigraphy was not in doubt.



2. Overhead composite photo of Maṣna' As Sukkar area TeS. XXII in 2018 (Q. Dasuqi).



3. Resurrected arches over sugar processing area of Maṣna' As Sukkar (GS.TeS.XXII) (K. D. Politis).



4. Aerial photo in late 2018 of Maṣna' As Sukkar from the east showing excavated areas, wooden pallet walkways and metal information signs (APAAME).

*Trench KSI.IX*

In Trench KSI.IX we removed a baulk 4.7m long and 1.2-1.5m wide left in the N-W corner of the Trench in 2015-2016 seasons in order to expose the mosaic pavement below (*Locus* 40). To this end, five stratigraphic *loci* (115, 117, 119-121) were excavated to an accumulative depth of 1.43m from the surface of *Locus* 115, down to the level of the mosaic floor. These *loci* were arbitrary given that all of the stratigraphy had been fully recorded in 2015-2016. Two E-W aligned walls, both dated to the Abbasid period, were exposed during the removal of this baulk and top plans and elevations for each wall were produced. Wall 116 was 3.2m long and 60cm wide comprised two facings of small- and medium- sized stones, some dressed and other stones unworked with an infilling of pebbles and cobbles. Once Wall 116 was dismantled, another E-W running wall was revealed running in the same alignment and measuring 4.2m in length and 45-60cm in width; it abutted Abbasid Wall 10 on its east side. Wall 118 was only one course of two facings of medium and large stones, some of which were reused Byzantine ashlar. Once this wall had been drawn, it was removed and the fill underneath excavated down to the mosaic pavement which was preserved for the most part, except for some areas in which its degraded plaster bedding remained.

*Trench KSI.IX*

Trench KSI.IX was begun in 2016 but was completed by 2018. Although this trench was badly disturbed by an artesian well in the centre, we carefully removed the remaining Abbasid walls and associated layers on the north side exposing more of the Byzantine mosaic floor. The patterns on the mosaic were like the ones discovered in 2016 since they continued.

*Trench KSI.X*

In Trench X excavations were made from the surface where Ayyubid / Mamluk settlement had been identified in previous seasons. Here, the east end of the room discovered in 2016 was exposed. There was more evidence (large kiln wall fragment and wasters) of a large pottery kiln for firing sugar pots here. But considering the width of the north-south wall and its two large buttresses to the east, we decided to excavate

deeper only in the eastern part of the trench where we uncovered substantial installations belonging to the Abbasid period. Characteristic pottery and glass finds (including a small complete vessel) helped us date this phase. In 2016 a large perforated open-necked jar was found here which was similar to another one found in 2008 both of these are associated with indigo production. Historical sources tell us that GHawr As Sāfi (ancient *Zoara* or *Zughar*) was known to be a producer of top-quality indigo. With deeper digging r, very large up-right stones were found in a semi-circle just below the “indigo” pot. It seems therefore, that this was part of an industrial installation possibly related to that indigo production. Unfortunately however, this had cut through and destroyed the Byzantine mosaic floor below, and all we could find of this were mostly loose mosaic cubes; one large section of mosaic floor found disjointed in the rubble had decorative patterns similar to the mosaics discovered during 2008 and 2016 in the eastern rooms of Trenches KSI.IX and KSI.VIII. (Fig. 5)

After fully documenting the Abbasid period stone-lined installation and its related layers, we dismantled them and the walls to reveal the Byzantine wall. On the west side of that wall we dug below the foundations to natural *wadi* - laid soil sediments. Some earlier Roman and Nabataean pottery sherds were found which indicate the earliest occupation of KHirbat Ash Shaykh ‘Īsā. On the eastern side, an entrance opening was found with remnants of a mosaic floor including part of a Greek inscription which unfortunately was badly disturbed.

During 2018-2019 rescue excavations were conducted at an eastern area of KHirbat Ash Shaykh ‘Īsā where farming works accidentally exposed a church. It was adorned with a decorated mosaic pavement which included a four-lined dedicatory Greek inscription within a *tabula ansata* mentioning the Bishop Petros and the Deacon and Custodian Sergios, dated to AD. 571/2 (Politis 2022). Mohamed Ali Hashoush, project conservator, cleaned and stabilised this mosaic as well as the one discovered in trenches KSI.VIII KSI.IX. and KSI.X.

Rescue excavations were also conducted at nearby An Naq’ where Byzantine cist graves were found by bulldozer activities.



5. Final plan of Byzantine period buildings, paving slabs and mosaic at KHirbat Ash Shaykh 'Isā (Q. Dasuqi).

### Area UT (Umm At Tawābīn)

Following the survey work of 2007 and 2015, archaeological excavations were conducted for the first time at Umm At Tawābīn in 2017 and completed in 2018. This large (ca. 880×450m total area) fortified hilltop site is strategically positioned above GHawr As Sāfi and the mouth of Wādī Al Hasā overlooking the southern Dead Sea plain and northern Wādī 'Arabah. (Fig. 6) At least four interior buildings (Forts A-D) and over one hundred stone circles and other associated features all enclosed by a ca. 2.5km-long wall were identified. These apparently served as an important link in a chain of fortifications that served a defensive and monitoring purpose, at one time augmenting the local Nabataean defence system and then the Roman *Limes Arabicus*.

Previous surveys provided evidence for a 1<sup>st</sup> century BC. to 6<sup>th</sup> century AD. occupation in one area of Umm At Tawābīn especially, the main fort on the site's citadel. However, to firmly establish the chronology of all of the site's architectural features distributed over a wide area, it was decided this year to excavate some strategically-placed trenches in different parts of the site in order to retrieve pottery and other material and to compare building and construction techniques where possible. In total, five trenches (UT.I-V) of varying sizes were excavated with Trench UT.I in the middle of Fort A on the citadel and four further trenches below the fort on the site's west side.

### Trench UT.I

Excavations began at Fort A on top of the citadel in the northern part of Umm At Tawābīn. Although there is little visible standing architecture, this citadel is the dominant area (notwithstanding its enclosure wall) because of its strategic location above ancient Zoara (Zughar) and Wādī Al Hasā (Fig. 6) with sweeping panoramic views across Wādī 'Arabah, and because of the concentration of sherds all over the surface. In deciding to first excavate this area, the goal was to expose some of the fort's original architecture and foundations and to excavate through a sequence of strata to retrieve dateable pottery and other finds, thereby confirming its status as a likely Nabataean/Roman defence post. Excavation of Trench UT.I (measuring 7×7m with fourteen *loci* dug to a maximum cumulative depth of 3.4m) revealed some of the structure's original architecture (Walls 4 and 7) including its foundations (Walls 7 and 8, *Loci* 6, 9-10), together with the NE section of a rectilinear reservoir lined with water-proof lime plaster (such hydraulic cement is derived from the Roman *opus signinum*) about 2.35 metres deep from the top of the reservoir down to its floor (the fill within excavated as *Loci* 5, 11-12, 16-18) which was exposed in the SW corner of the trench and extends southwards from Trench UT.I. A single E-W running line of large stones (Wall 4) was positioned directly on top of the reservoir's northern boundary, two of



6. Panoramic view of Umm At Tawābīn from the south with ancient Zoara, Wādī Al Ḥasā and the Dead Sea in background (K.D. Politis).

the dressed stones at its west apex indicating the position of a door-post. The reservoir was surrounded on its east side by a (single course) stone foundation wall (Wall 8) overlying a 0.5m thick deposit of densely packed rubble stone designed to keep this structure in place. Elsewhere, the foundation walls of the fort (Walls 7 and 8) were built directly in top of a 0.2 metre thick layer of greenish-yellow clay that overlies the natural fractured and fragmented dolomite stone. Excavation of Trench UT.I produced a considerable quantity of stratified pottery dating from the 1<sup>st</sup> century BC. onwards, seventeen coins and other finds including a stone sling-shot and part of a stone-made incense burner inscribed in Nabataean Aramaic.

#### *Trench UT.II*

Two of the stone circles below the fort on the western side were also excavated to better understand their date and function. Trench UT.II in Stone Circle A (outer dimension: 4.2×3.5m, inner: 3.4×2.5m) was excavated to a depth of 0.90m from *Locus* 1 down to natural pebbly/gravelly sediments (*Locus* 5). It did not contain any interior features beyond a thin layer of ash and a few pottery sherds. Nor did the line of unworked stones that form a circle formation on the ground extend below the surface level.

#### *Trench UT.III*

Trench UT.III within Stone Circle B (outer dimension: 4.5×3.2m, inner: 3.4×2.5m), about 20 metres to the north, was excavated to a depth of 1.08-1.2m (*Loci* 1-9) and like Stone Circle A, the surface stones delineating its circular form on the ground did not extend below the surface. This stone circle was found to have been built directly on top of two walls (Walls 4 and 10)

belonging to an altogether different structure (or structures) that seems to date to an earlier period. There was also a circular ashy fire pit (*Locus* 6) located within the structure next to Wall 4 on its north side, and some stratified pottery recovered from *Loci* 1-2 which will be studied at a later date.

#### *Trenches UT.IV-V*

To the south of the stone circles, also on the west side of the site, Trench UT.IV (3×2m) was excavated as a 1.2m-deep probe (*Loci* 1 surface down to *Locus* 6 natural pebbly/gravelly sediments) along a line of very large boulder stones that, together with another parallel line of boulders (2m to the west), forms the enclosure wall of Umm At Tawābīn. The trench was laid against the east side of the easternmost wall and while only two sherds were recovered from the surface (*Locus* 1), we can now understand how this fortification wall was constructed, made all the more clear by the excavation of Trench UT.V (4.5×3m) farther to the south. Here, an approximately 1m-deep probe (*Loci* 1-5) was dug across the two lines of boulder stones to obtain a complete section profile of the wall that showed the full dimensions of this massive fortification: an approximately 3.7 to 4m wide case-mate wall (the easternmost wall being a single line of boulder stones, 0.4-0.5m wide, with a 1.8-2m trench separating the westernmost wall that is 1.6m wide, with two facings of stone).

#### **Conclusions**

Excavations at Umm At Tawābīn showed that the hilltop forts and associated reservoirs were convincingly Nabataean (1<sup>st</sup> century BC. to 1<sup>st</sup> century AD.) and were defended

on the south side of the summit by a series of five fosses. Fort A was built and occupied from the first century BC. onwards (based a preliminary study of the finds), serving as a lookout position designed for defensive and monitoring purposes. Although the pottery collected from within Stone Circle B has yet to be fully studied, excavation within two of the stone circles on the site's west side suggest that they may represent later (post-Nabataean/Roman) structures, perhaps built during the medieval Islamic periods or thereafter, possibly by Bedouin as animal pens or as the foundations of shelters such as tents. Some of these some circles are also clearly used for burials. Of special interest, Stone Circle B is built on top of two walls belonging to a structure (or structures) forming part of an occupation that together with some surface sherds may indicate the site's earlier origins.

Finally, the Umm At Tawābīn enclosure wall on its west side is apparently a massive fortification comprising two wall lines of large

boulders that form a type of wide case-mate wall. It is possible that this enclosure predates the 1<sup>st</sup> century BC. given the type of masonry and construction in evidence and its scale of fortification. Once a study of all of the finds recovered by excavation, along with some more surface pottery, has been completed, a better defined chronology of Umm At Tawābīn will be revealed which may be much broader than previously thought.

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