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Primary heading	Bold	12	15
Secondary heading	<i>Italic</i>	12	15
Tertiary heading	<u>Regular</u>	12	15
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Footnotes	Regular	9	10
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Ordnance Survey
2022 The Official Website of the British Ordnance Survey <https://www.ordnancesurvey.co.uk/about/history> (accessed 21 March 2022).

h) *E-Books*:

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System of Romanization from Arabic

Consonants

ء	' (except where initial)	ض	d
ب	b	ط	t
ت	t	ظ	dh
ث	th	ع	'
ج	j	غ	gh
ح	h	ف	f
خ	kh	ق	q
د	d	ك	k
ذ	dh	ل	l
ر	r	م	m
ز	z	ن	n
س	s	هـ	h
ش	sh	و	w
ص	s	ي	y
ة	at or ah		

Long Vowels

ا، ي	ā
و	ū
ي	ī

Short Vowels

ـَ	a
ـُ	u
ـِ	i

Common Nouns

تَلّ	Tall	دَيْر	Dayr
جَبَل	Jabal	عَيْن	'Ayn
خَرْبَة	KHirbat or KHirbah	وادي	Wādī

Doubled Letters (Tashdīd)

عَيّ	'Ayy	ثَوَاب	THawwāb
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Arabic Definite Article*

Solar Letters	الْغَوْر	Al GHawr
(أ، ب، ج، ح، خ، ع، غ، ف، ق، ك، م، هـ، و، ي)	الْكَرَك	Al Karak
	الْمَفْرَق	Al Mafrāq
Sun Letters	الدَّرِيح	Adh DHarīh
(ت، ث، د، ذ، ر، ز، س، ش، ص، ض، ط، ظ، ل، ن)	الرَّمْثَا	Ar Ramthā
	الشُّوبَك	Ash SHawbak

* Please use (Nonbreaking Space) between sun or solar (Al) and the rest of the word.

List of Abbreviations

AA	Archäologischer Anzeiger
AAAS	Les Annales Archéologiques Arabes Syriennes
AASOR	Annual of the American Schools of Oriental Research
ADAJ	Annual of the Department of Antiquities of Jordan
AfO	Archiv für Orientforschung
AJA	American Journal of Archaeology
AUSS	Andrews University Seminary Studies
BA	Biblical Archaeologist
BAR	British Archaeological Reports
BASOR	Bulletin of the American Schools of Oriental Research
CRAI	Comptes Rendus de l'Académie des Inscriptions et Belles Lettres
JAOS	Journal of the American Oriental Society
JMA	Journal of Mediterranean Archaeology
JNES	Journal of Near Eastern Studies
JPOS	Journal of the Palestine Oriental Society
JRA	Journal of Roman Archaeology
JRS	Journal of Roman Studies
LA	Liber Annuus
LIMC	Lexicon Iconographicum Mythologiae Classicae
MA	Mediterranean Archaeology
PEFQS	Palestine Exploration Fund Quarterly Statement
PEQ	Palestine Exploration Quarterly
QDAP	Quarterly of the Department of Antiquities of Palestine
RB	Revue Biblique
SHAJ	Studies in the History and Archaeology of Jordan
WA	World Archaeology
ZDPV	Zeitschrift des Deutschen Palästina-Vereins

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EXCAVATIONS AT TALL USHAY‘IR A PRELIMINARY REPORT ON THE 2021, 2022 AND 2023 SEASONS

*Dominik Bonatz, Nathalie Kallas, Yvonne Helmholz, Laith Alshboul,
Stefano Aprà, Valery Schlegel, Giampiero Tursi and Marina Weiss*

Introduction¹

The archaeological site of Tall Ushay‘ir (MEGA-J No: 2795) is located 3km west of Irbid in Northern Jordan, bordered by the two towns of Kufr Yūbā to the south and Zaḥar to the north (**Fig. 1**). This prominent, free-standing mound offers expansive views westwards across the Wādī Al Jurn valley and beyond to the Jordan Valley, with in clear weather distant views of the Mountains of Galilee, Golan Heights, Anti-Lebanon, and Lebanon.

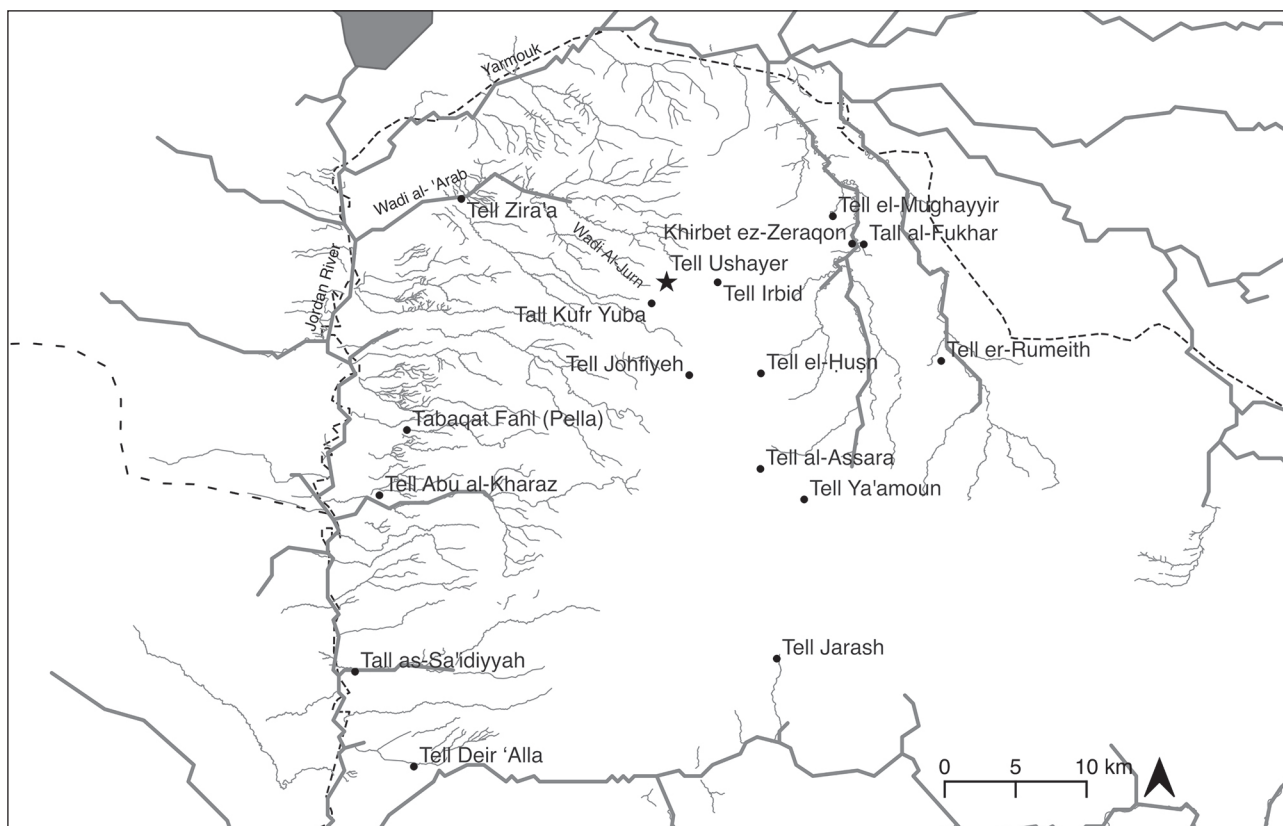
Tall Ushay‘ir is a distinctive, circular mound, free from modern constructions and landscaping. It rises 14 meters above its surrounding terrain, with a peak elevation of 548m above sea level (**Fig. 2**). The top of the mound is nearly flat, with a diameter of 85.70 meters, and the site’s total area is 5771 square meters. Remnants of a massive enclosing stone wall are still visible around the mound top.

Despite its visibility, Tall Ushay‘ir has received limited archaeological attention. It was first mentioned by G. Schumacher (1890: 190) and briefly listed in subsequent

surveys (Glueck 1951: site no. 80; Lenzen and McQuitty 1988: site 009; el-Khourī *et al.* 2006: 126, site 4). Pottery from the Early Bronze Age, Late Bronze Age, Iron Age I and II, and the Byzantine period has been identified, and a test excavation by the Jordanian Antiquities Service remains unpublished.

Largely unexplored, Tall Ushay‘ir stands out in the northern Jordanian plateau’s rich archaeological landscape. It offers an excellent opportunity to gain insights into a little-researched period of ancient North Jordanian history, especially regarding the region’s fate in the light of the socio-political developments that shaped the whole Near East at the beginning of the Iron Age. A project was launched by Prof. Dominik Bonatz from the Freie Universität Berlin in cooperation and under the supervision of the Jordanian Department of Antiquities. In 2018 a preliminary investigation was conducted, which was followed in 2019 by a geomagnetic survey (see Bonatz 2020). Three excavation campaigns have been conducted so far, in 2021, 2022 and 2023. The project immediate aim is to determine the occupation sequence and nature of the site, by studying its architectural history, intramural layout and material culture. This work will shed light on the regional role of the site within a broader historical, political, and economic context. The results so far paint a unique picture of a fortification system much more formidable than initially imagined.

1. This article is based on invaluable and numerous discussions with all listed authors, as well as field notes and area reports by Laith Alshboul, Stefano Aprà, Valery Schlegel, Giampiero Tursi, and Marina Weiss. The text itself was compiled by Nathalie Kallas. The proposed stratigraphic sequence is the result of an analysis of the excavation documentation conducted by Nathalie Kallas. The pottery analysis included in this study was conducted by Yvonne Helmholz. The collaboration and contributions of each of the authors were instrumental to the research and conclusions drawn in this paper.



1. Location of Tall Ushay'ir and other Late Bronze Age and Iron Age sites in the North Jordanian Plateau.

Preliminary Work at the Site

In 2018, an initial investigation at Tall Ushay'ir included a systematic collection of surface pottery sherds and a small excavation on the northern slope to date the city-wall and its relation to other features. Additionally, two segments of the city-wall were cleaned and documented. The analysis of pottery sherds from the collection of surface material identified specimens from Late Bronze Age II, Iron Age I and II, Iron Age III (Persian Period), and Hellenistic periods, with earlier and later pottery being rare (Alshboul 2019).

A magnetometry survey was conducted in 2019, covering approximately 7100m² of the Tall's top and slopes. Despite interference from modern activities, the survey clearly revealed the course of the fortification wall and potential gate locations. It also identified various building structures, pits, and ditches on the mound's top, as well as substantial stone structures in the southeastern corner and the western half. These findings suggested complex fortifications and internal structures that require further excavation to fully understand their layout, function, and dates.

Project Organization and Work Conducted

Before presenting the scientific results, some remarks on the project's organization so far are warranted. In 2021, the foundation of flexible and comprehensive documentation methodology and system was developed. The site's topography was surveyed in detail in 2021 using a JAVAD GNSS device (Triumph LS / Triumph-2 / Radio). It covered the mound itself and the surrounding plateau, where accessible (**Fig. 3**). The final surveyed area covers approximately 8.42 hectares with an elevation difference of about 26.5 meters (530.62-557.13m UTM). The excavation grid system was aligned with UTM coordinates, dividing the area into 10×10 meter squares. Using UTM localization also allows us to incorporate other publicly available data and seamlessly integrate the geomagnetic survey results into our analysis.

The documentation system is a blend of analog and digital methods. The hub for all our digitized data and topographical information is a server-based MySQL database. A variety of filled forms, field journals, material analysis, plans, section drawings, and ceramic drawings

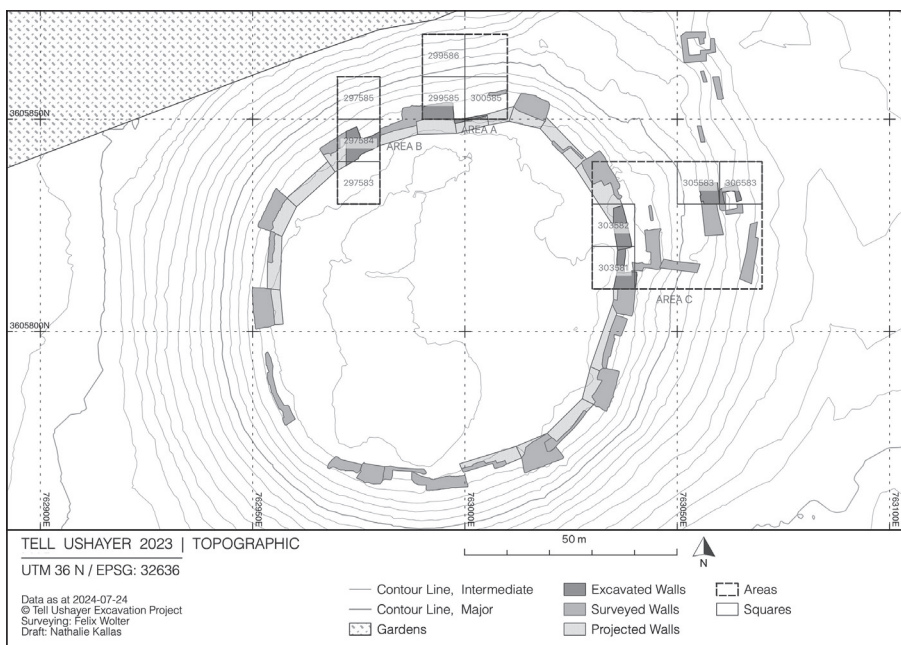
are digitized using various software and uploaded to the database. All excavated contexts are described, photographed, captured with photogrammetry, and linked with topographical data. Descriptive data and relational information are combined with topographical data and processed in GIS and a 3D computer graphics software (Blender) to enable a relatively quick understanding of the stratigraphy. This is then combined with ceramic analysis to supplement phase division and dating. The database and documentation system are continually refined

and optimized.

The team conducted three regular excavation campaigns so far, the duration of the field campaigns varied depending on the season's goals: in 2021 between September 4th and October 13th, in 2022 from July 25th and September 8th and in 2023 from August 15th and September 11th. The three areas chosen for excavation were determined based on the project's research questions and guided by the preliminary work conducted at the site (**Fig. 3**). In addition, two ceramic study campaigns



2. The mound of Tall Ushay'ir seen from the east.



3. Topographic map of Tall Ushay'ir, with excavation areas and traced remains of the fortification system.

took place. These campaigns offered students from the Freie Universität Berlin and Yarmouk University in Irbid the opportunity for international exchange and practical training in various aspects.

Area A

Excavations began in 2018 and continued through all three campaigns. The excavated trench, extending from the *Tall* summit down the northern slope, is located in squares 299585, 299586, and 300585 (see **Figs. 3, 5**). This trench aimed to investigate the relationship between an above surface large cobble/pebble accumulation, a nearby row of stones, and the fortification wall. Findings revealed the massive scale and construction techniques of the fortification system. Additionally, extramural zones exposed remains of various activities, and a deep trench provided insights into the stratigraphy of the *Tall*. In this Area, 138 *loci* were recorded and excavated over 4 years, including the preliminary work in 2018.

Area B

Excavated in 2021 and 2022, this area focused on a gap in the defensive wall identified during the geomagnetic survey. The trench,

within squares 297583, 297584, and 297585, aimed to explore the wall's relation to a visible buttress and the intramural occupation (see **Figs. 3, 6**). While no gate was found, the area provided valuable insights into the defensive system and uncovered remains from the last phases of intramural occupation. In Area B, 162 *loci* were recorded and excavated.

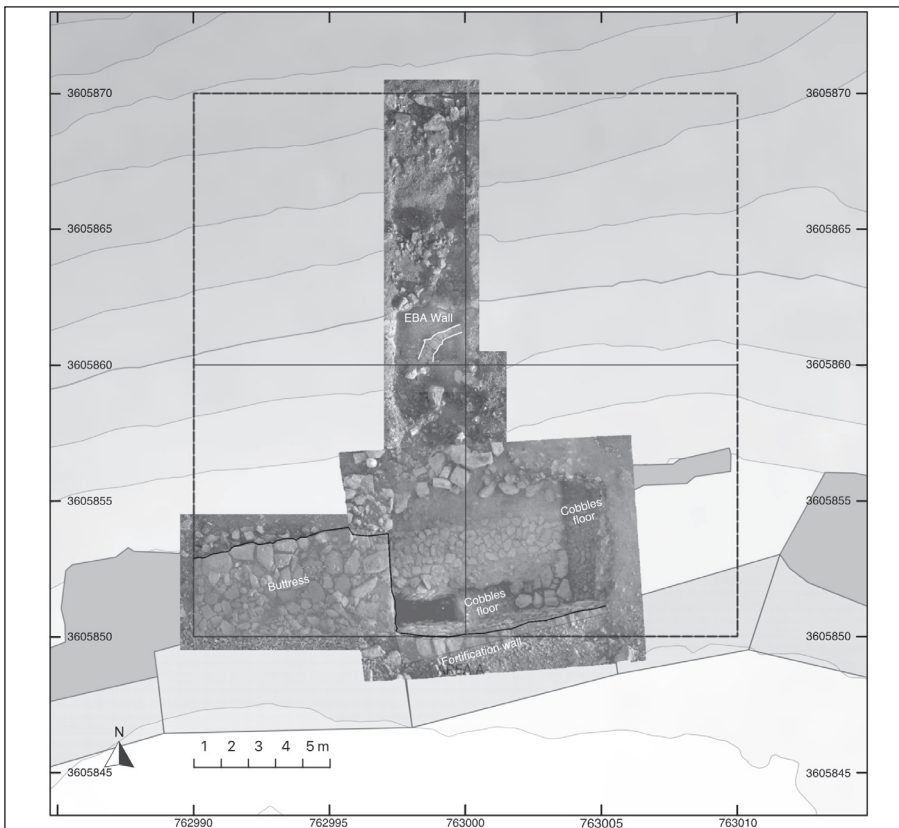
Area C

Excavated in 2022 and 2023, this area targeted the gate location, the adjacent ramp, and the fortification system on the slope. Trenches spanned squares 305583, 306583, 303581, and 304382 (see **Figs. 3, 7 and 8**). These excavations enhanced our understanding of the fortification system's construction, collapse, and occupation phases. In Area C, 94 *loci* were recorded and excavated.

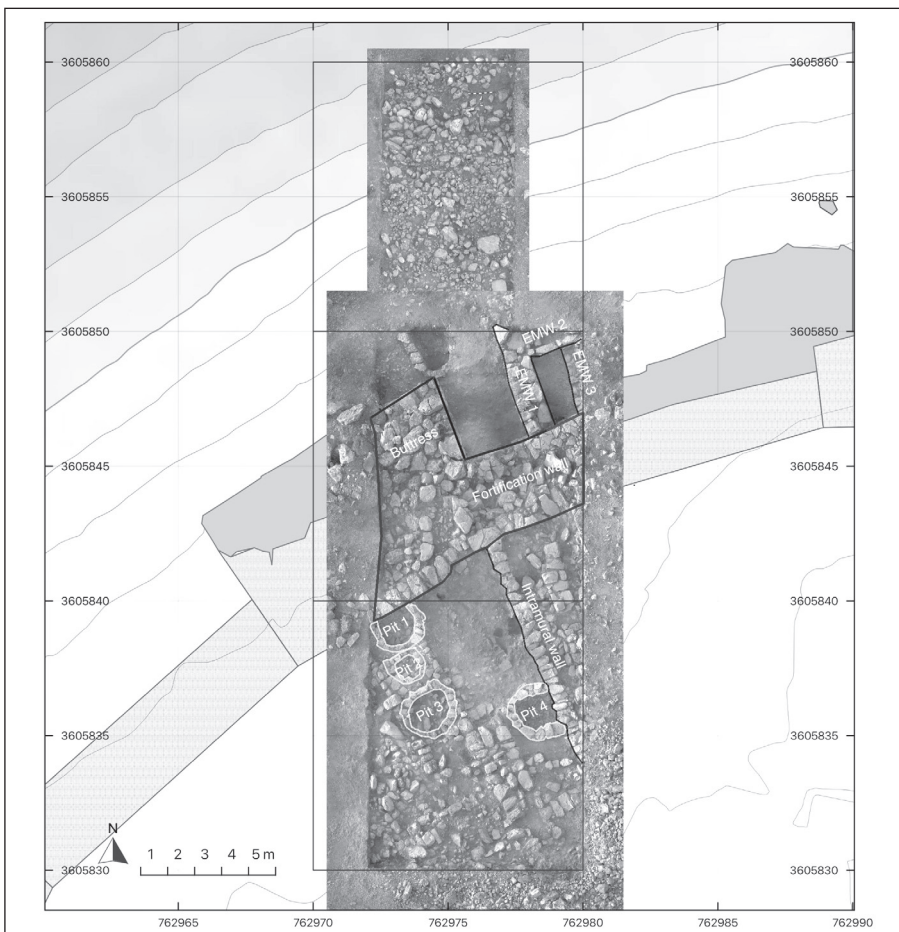
Overall, the excavations contributed significantly to our understanding of the fortification system and the stratigraphic sequence of Tall Ushay'ir. The earliest remains date back to the Early Bronze Age. Evidence of the Middle and Late Bronze Ages is sparse in our excavation areas, indicating that either the site was abandoned during this period or that it was reduced in size. During the early Iron



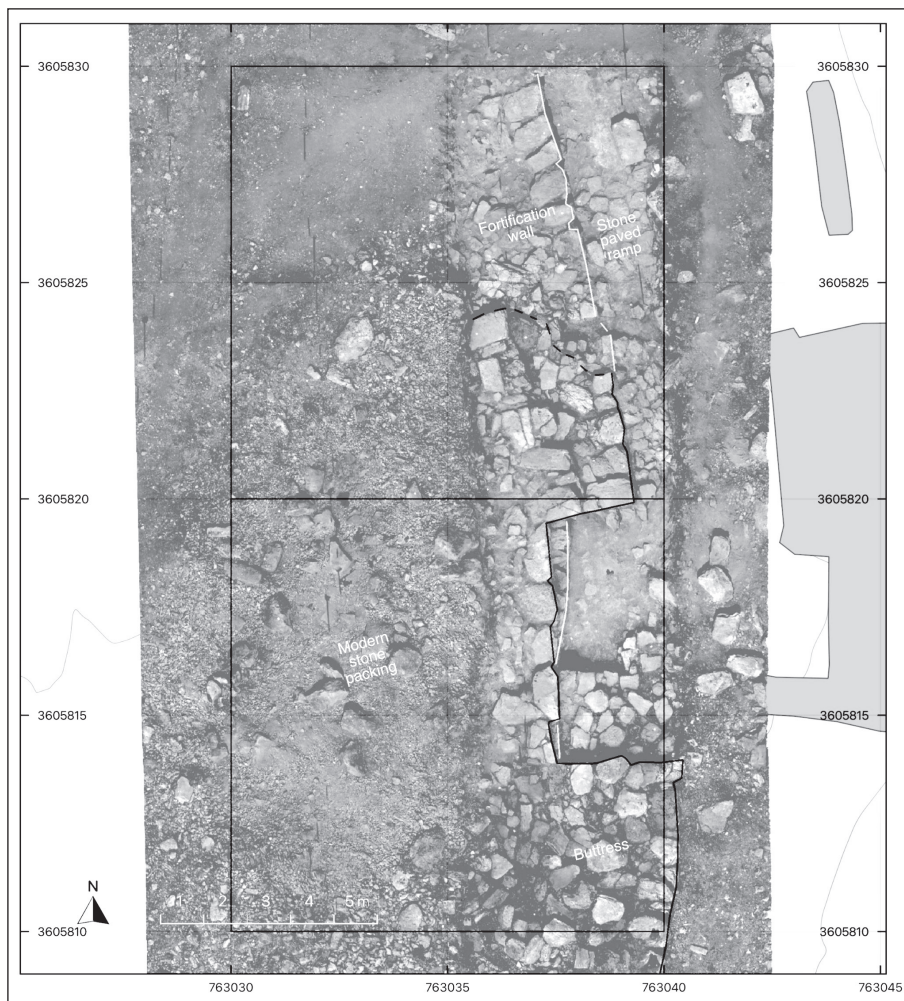
4. The EBA remains: the curvilinear wall found in Area A and a sample of grain wash sherds.



5. Combined orthophotos of Area A showing the final excavation situation.



6. Combined orthophotos of Area B showing the final excavation situation.



7. Combined orthophotos of the trench on the edge of the mound in Area C showing the

Age, a massive fortification system was erected which gave the mound its final shape. Our investigation of the intramural and extramural areas indicates that the site remained in use until the end of the Iron Age. The collected evidence indicates a limited usage during later periods, as indicated by the scarce pottery sherds and a small Roman-era structure uncovered in Area C in 2023.

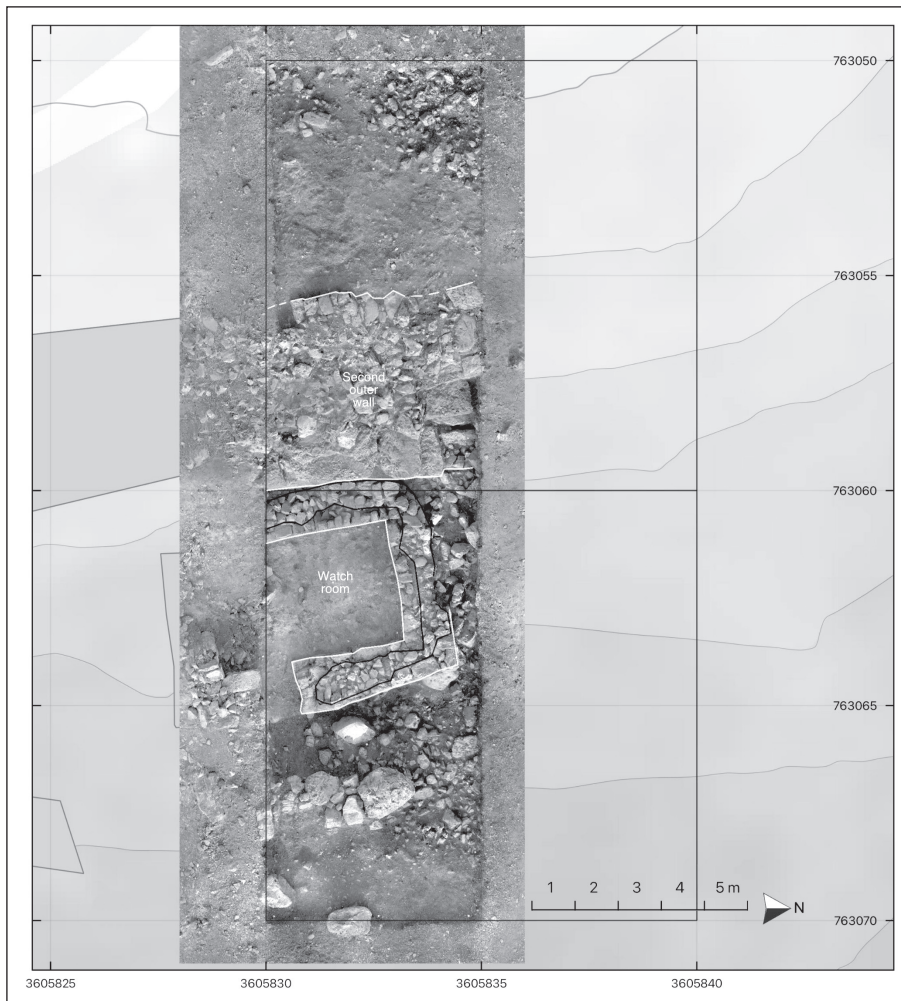
Evidence of an Early Bronze Age Occupation

Evidence of an Early Bronze Age occupation was attested in two deep trenches in Area A (see **Figs. 4, 5**). The first trench located on the northern slope in square 299586 was excavated in 2021. The 2-meter-wide trench reached a depth of about 2.30 meters from the original surface and revealed a thick layer of compact sandy soil mixed with stone fragments and few pottery sherds, likely an artificial deposit. Underneath the deposit, layers containing mixed pottery were found, leading to the discovery of a

curvilinear wall segment slanted southeast with three courses exposed. The layers delimited by the wall, yielded exclusively fragments of Early Bronze Age (EBA) pottery. The wall segment is curved, and although only partially exposed, indicate the site might have had curvilinear vernacular architecture, a type of architecture that spread in a vast area of the Levant during the EBA I. The architecture of this wall is similar to that of the structures found at Tall Jāwā in central Jordan, Jabal Al Muṭawwaq located along the Middle Wādī Az Zarqā' valley and *Al Basātīn*, in Wādī Zīqlāb, Northern Jordan, or the non-excavated sausage-shaped houses in Leja (Betts and Helms 1991; Fernández-Tresguerres Velasco 2005; Gibbs *et al.* 2009; Braun 2021).

Further up the slope a deep trench was excavated in 2022 and 2023 and the deepest layer reached contained 60% EBA pottery². The pottery collected from both deep trenches

2. This deep trench is located in the corner of the main fortification wall and one of its buttresses in square 299585.



8. Combined orthophotos of the trench on the slope of the mound in Area C showing the final excavation situation.

show quite a substantial occurrence of sherds with Grain Wash decoration. The painted body sherds with reddish and brownish bands above a whitish washed surface might have belonged to large storage jars or pithoi. This pottery group is dated to the Early Bronze Age I–III (Genz 2000: 279–285). Other EBA markers such as ledge handles, or rim fragments of hole mouth jars decorated with bands of finger imprints or incisions were also found. The EBA occupation of Tall Ushay'ir is still identified only in very limited area. Further investigation and an expansion of the area towards the south and east will shed more light on this phase of the occupation of the *tall*.

The Layout of Tall Ushay'ir's Fortification System: Insights from the 2021 Mapping and Geomagnetic Prospection

As mentioned in the introduction, remnants of the fortification wall and other structures are visible all over the site's surface. During

the 2021 campaign, an extensive mapping of visible remains at Tall Ushay'ir was conducted using a GPS device. Combined with the results of the magnetometry, these results significantly enhanced our understanding of the site's fortification system (see Fig. 3).

A circular wall surrounds the mound's top. It consists of wall stretches alternating with substantial protruding buttresses. These buttresses are the most prominent of the surface remains, ranging from 7.50 to 10 meters in length and protruding between 2.50 to 3.50 meters from the wall's facade. The intervals between the buttresses, closed by the main fortification wall, vary between 10 and 15 meters.

To the east, the fortification system features an outward projecting structure, indicating the location of the gate and a parallel ramp course along the mound slope. This is complemented by a perpendicular wall and a second outer wall, identified through geomagnetic prospection and surface remains mapping. At the foot of

the mound, two rectangular watch rooms were traced, likely serving to safeguard and monitor the settlement entrance. The walls of these units seem to have been well-preserved, with one still in use by shepherds.

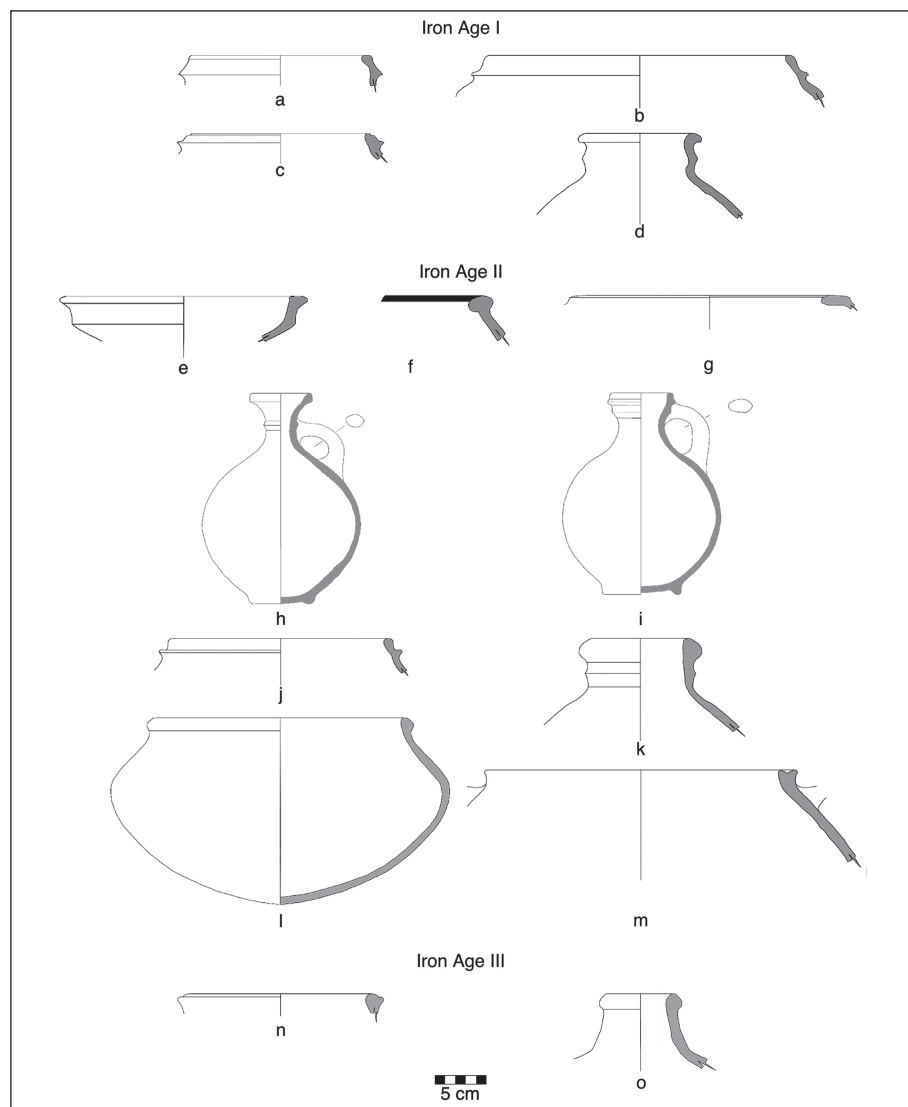
Visible sections of stone walls in the west and south require further investigation to determine their connection to an outer fortification or retaining wall. These features underscore the complexity and strategic design of Tall Ushay'ir's fortification system, reflecting its historical significance and defensive capabilities.

The Fortification System: its Construction and Dating

The two deep trenches in Area A mentioned earlier, revealed that the *tall* was raised during the construction of the fortification wall surrounding the mound's top. The EBA remains

down the slope were covered with an artificial deposit that contained mixed pottery, probably added to raise or stabilize the slope, or to even out its surface. In the deep trench excavated at the edge of the slope, in the corner of the wall stretch and one of the buttresses, a uniform artificial deposit was excavated for more than 3,5 meters without any change in consistency. The collected pottery from throughout this context included besides the EBA material mentioned above, Late Bronze Age, transitional and Iron Age I sherds, with very few indications of MBA material so far. Neither the bottom of the wall nor of the buttress were reached. The elevation reached was *ca.* 1m below the elevation of the EBA remains further north.

Our current preliminary interpretation is that after a probable hiatus following the EBA occupation (at least in this part of the mound),



9. Pottery.

the builders of the fortification wall dug deep trenches into the EBA levels and started elevating the wall / buttress and heaping soil to artificially elevate the level of the mound. The artificial raising of the mound seem to have progressed hand in hand with the erection of the massive fortification wall. As mentioned above the main wall surrounding the *tall* consists of an alternation of twelve wall stretches and protruding buttresses. The whole, as traced from surface remains, has a total length of *ca.* 275m (see **Fig. 3**). We exposed in our trenches three segments of this wall and adjoining buttress, together with the buttress cleared in 2018, a total of 55m. From the excavation in Areas A and B it was clear that the stones of the wall stretches and the buttresses were interlocking and that these were erected together. In Area B, the trench extended from the intra mural to the extra mural area crossing the wall width, which turned out to be 3m wide, and a total of 6,5m with the buttress (see **Fig. 6**). The wall itself, as observed in Areas B and C, was constructed of large and only roughly worked boulders following the so-called double-faced method, with the inner and outer façades built of tightly-packed regularly laid stones and the space in between filled with loosely deposited stones, even boulders. The four exposed and documented buttresses are built according to the drystone method, from large stones without any traceable mortar to bind them together. It should be highlighted that some of the single stones used in the buttresses reach 2m in width. From the deep trench in Area A we so far have 3,5m sub-floor elevation of the wall and buttress and 2,8 height above the earliest identified floor.

This impressive wall is moreover a part of a much more complex fortification system. The location of the gate is supposed to be in the east, based on the magnetometry and the surface remains tracing. Its location is further protected by a series of defenses that develop on the eastern slope. The upper trench in Area C was placed to probe into the location of the gate as well as the adjacent intra – and extra mural areas (**Fig. 7**). Work started here in 2022, it required the removal of a massive modern stone packing, *ca.* 200 m². It revealed a stretch of the wall and to the outside a ramp partially stone

paved and partially plastered on which massive blocks from the wall collapsed. Further south, towards the supposed location of the gate, the wall turns westwards then southwards again until it meets the buttress. The wall here shows structural modification that indicate at least three phases of alterations (see black and white lines on (**Fig. 7**) for the two earlier phases). Unfortunately, the continuation of the ramp at the gate opening was disturbed by a minor Roman structure, the only Roman structure found in the excavation so far. Understanding the development of the gate is still preliminary and requires further expansion of the area eastwards and westwards.

The trench running down the eastern slope was also excavated in 2021 and has revealed a massive second outer wall (**Fig. 8**). It is *ca.* 6,5 m wide, and consists of a substructure constructed of massive stones, up to 2 meters long, and a superstructure of smaller stones. The foundation has not been reached yet, so the construction date is not secure, but from the construction technique it seems to belong to the fortification system. One half of one of the watch rooms leaning against this wall from the outside was investigated. The structure had been reused in modern times, its walls were rebuilt, its floor and door opening covered with cement, and was subsequently used as a dumb afterwards (on (**Fig. 8**) the white and black lines indicate the original and rebuilt walls of the watch room). Understanding the earlier history of this structure still requires further excavation. Nonetheless, we noted that the original walls have a similar building technique as the intra-mural ones in Area B, and we would at the moment preliminary assume a similar date.

So, when did this ancient mega building project take place? The answer is in the pottery from two key contexts. The first is the excavated fill of the trench in the corner of the wall and buttress in Area A. In this fill the youngest sherds are dated to the Late Bronze Age / Early Iron Age, for instance cooking pots with an elongated ridge in the outside (**Fig. 9a-c**). Parallels could be found at Tall Al Juhfiyyah (Lamprichs 2007: 433, Pl. 49:3; 439, Pl. 55: 2; 443, Pl. 59: 4), Tall Zar‘ā (Schwermer 2014, 42, Pl. SB E 3: 2), Tall Ya‘mūn (Hindawi 2006: 369, Pl. 75:1) and Pella (Mc Nicoll 1992: Pl. 50:6). The date

of these sherds indicate that when the fill was deposited there was no later material neither in the reused soil from the mound itself nor from nearby areas where the soil of the foundation could have been sourced. This fill was sealed with a cobbles floor on which, in the corner between the wall and the buttress, evidence of a temporary fireplace was found. The stone circle with charred material indicates most probably a single firing event limited in time that serves as a *terminus ante quem* for the floor. The closest parallels to the ceramic assemblage associated with this fireplace, especially to a jar with an s-shaped profile and an everted rim (**Fig. 9d**), are found in Tall Al Juhfiyyah in the south (Lamprichs 2007: 425, Pl. 41:1) and are dated to the Iron Age I.

The Extra- and Intramural Remains

Extramural remains were excavated in both area A and B, while intramural remains have been exposed so far only in Area A (see **Figs. 5, 6**). In Area A, outside the fortification wall, the cobbles floor was succeeded by a series of deposits and later floors. During the Iron Age II, parts of the wall collapsed outwards directly on a floor / walking surface and down the slope. The pottery from contexts immediately under the collapse and from the collapse itself indicate it took place in the Iron Age IIC. Fragments of a carinated bowl with an everted rim a burnished finishing, and of a jar with a red slip on top of the rim lip were found on the floor on which the wall collapsed (**Fig. 9e-f**). These two vessels are common during the Iron Age II A-B with parallels in Kabri in the northern coastal plain and Hazor תל וקאס in the upper Galilee (Lehmann 2015: 127, Pl. 2.1.5: 21 + 22; Ben-Tor and Zarzecki-Peleg 2015: 150, Pl. 2.2.2: 3 + 13). A fragment of a holmouth jar or krater, with a unique groove very close to the lip (**Fig. 9g**), was discovered in the collapse above that floor level, and is dated by parallels in Samaria السامرة (Tappy 2015b: 335, Pl. 3.2.2:12), Lachish תל الدوير (Tappy 2015b: 335, Pl. 3.2.5:14) and Tall Al 'Umayrī (Bienkowski 2015: 427, Pl. 3.6.2:1) to the Iron Age IIC.

The stones of the collapse were subsequently adjusted and reused to erect a wall that closed of the extramural area. In this part of the *tall*, this phase marks the end of the usage of

this area. Unfortunately, no floors or immediate collapse could be associated with this later wall to provide an exact dating. Nonetheless, preliminary observation indicates that the pottery from associated contexts is predominately Iron Age.

In Area B evidence of building activities in the extra mural area was also identified. The excavations exposed a wall abutting the outer face of the fortification wall and a second perpendicular wall (see **Fig. 6** – EMW 1 and EMW 2). These enclosed a small area within our trench, in which we excavated from top to bottom several layers of deposit, a stone collapse and a floor. Underneath this floor, we have started exposing the top course of an earlier stone wall also abutting the fortification wall (see **Fig. 6** – EMW 3). Unfortunately, the pottery in these contexts was scarce and inconclusive.

The focus of the excavation in Area B was on the intramural occupation. Under the topsoil, the trench was mostly covered by a stone collapse or scattered stones. From the last occupation phase, four stone-lined pits were identified (see **Fig. 6** – Pits 1 to 4). Such structures are believed to have had a storage function, most commonly for grain (Itkin 2022; Pucci 2023). This function is corroborated by the impressive number of grinding tools and large proportion of food processing and consumption pottery shapes from the associated assemblages. Unfortunately, the rarity of diagnostic pottery sherds from the fills of the stone lined pits does not allow us to provide a *terminus ante quem* for the usage of these pits. A tentative dating of this material (**Fig. 9n-o**), based on few parallels in Tall Al Juhfiyyah, is in the late Iron Age III (Lamprichs 2007: 444, Pl. 60:1; 429, Pl. 45:1).

Under the stone collapse, not associated directly with the pits, two almost complete jugs were found. One jug was almost intact missing only small parts, it has an everted rim, a narrow neck, a ring base, and a globular body (**Fig. 9h**). Its handle was attached above a ridge on the neck. Parallels were found in Iron Age II A-B Megiddo and Tannach (Ben-Tor and Zarzecki-Peleg 2015: pl. 2.2.16: 7 + 8) and Iron Age IIC Tall Al Fukhkhār (Andersen *et al.*: 300; Strange 2015: Pl.170,15). The second jug was smashed by the stones and is slightly smaller (**Fig. 9i**).

It has a thicker and more rounded rim and its handle is attached closer to the ridge on the neck. Its form resembles the juglet with white slip and red decoration found in the Early Iron Age building complex in Tall Abū Al KHaraz (Bürge 2015: 81, see **Fig. 6**).

From an earlier phase a preserved floor and associated *tannur* were identified. The *tannur* was unfortunately looted in the night after we exposed it and before we could properly excavate it. The material that was dumped within the trench after the looting was carefully collected, and could help us date its fill. Vessel types that were collected from the *tannur* and scattered immediately above the associated floor are for food preparation, consumption and storing. Common among the material are cooking pots and jars of various types, as well as kraters (**Fig. 9j-m**). This phase is dated to the Iron Age II based on the parallels found at Tall Zar'ā (Schwermer 2014, 59, Pl. KtEZ2b.4:1), Tall Al Juhfiyyah (Lamprichs 2007: 419, Pl. 35:1, 450, Pl. 66), Dor (Lehmann 2015: 119, Pl. 2.1.7:3), Samaria (Tappy 2015a: 203, Pl. 2.3.5:4), and Hazor (Ben-Tor and Zarzecki-Peleg 2015: 155, Pl. 2.2.5:5).

These intramural remains were excavated to the west of a massive intramural wall that we exposed for a length of 8 m without yet finding a corner (see **Fig. 6** – Intramural wall). This wall abuts the inner face of the fortification wall. It still remains to be understood whether this intramural wall was erected together with the fortification and what was the main use of the intramural area of the settlement that warranted the construction of a such a massive defensive system. Noteworthy is that there is a *ca.* 2,3m difference between the latest floor excavated in the intramural area in Area B and the oldest extramural floor, indicating that the two phases we identified so far were the latest two phases of quite a long occupation sequence.

The evidence from the excavation in the intra and extra mural areas in Areas A and B indicate that the wall remained in use until the Iron Age IIC. A dating of its collapse will have to await the study of the pottery collected from the two collapse contexts excavated on the slope both in area A and B. The latter is quite massive, extending for *ca.* 10m down the slope, and will be the focus of the 2024 excavation campaign.

Monitoring and Looting

Many modern looting pits were observed during the topographic recording of the *Tall* in 2021 and 2022. To record the current state and provide a base for future monitoring activities, all pits with diameters above 50cm were surveyed and measured in 2021 and newer ones were added in 2022 (so far 43 have been recorded).

Many of the looting pits date back to several years / decades ago, such as the large looting pit excavated in Area B underneath a more recent looting pit, and which contained in its fill plastic refuse, packaging and textile from the 1990s. Other looting pits are of more recent date, for instance those dug between the excavation campaigns. Especially problematic for the excavation process and the project results is the looting and disturbance activities that took place during the excavation season, as happened several times in 2018 and three times in 2021. The most serious was the destruction and almost complete removal of an important excavation context in the Iron Age building in Area B, the discovered *in situ tannur* and pottery vessels were destroyed and discarded by the looters. As these activities were taking place during our absence from the site (*e.g.* evening, night, weekend), we decided to place guards during the 2022 and 2023 seasons. This deterred most of the disturbance during the excavation, with one minor exception. Unfortunately, during the months after the excavation has ended in 2022 all excavated areas were the subject of major intentional disturbance, as observed by one visitor to the site and reported by some of our local team members. Despite our efforts to cover the excavated trenches with a protective resistant fabric and backfilling the trenches with stones and soil, walls of large stones were toppled in areas A and B, and the whole backfill, and fabric was removed from Area C.

During the spring of 2020, as part of the preventive maintenance measures for archaeological sites of the Department of Antiquities, a much-appreciated weeding and cleaning operation took place at the site of Tall Ushay'ir. During this limited procedure, some of the stones scattered on the site surface were collected in heaps all over the mound. Unfortunately, this might have caused some

unintentional damage to few of the ancient sub-surface structures, as could be seen in 2021 from the still-visible stone imprints. As some of the heaps might collapse or be re-scattered over the years, causing some misinterpretation of their origins, we started their systematic recoding in 2022. So far 56 heaps were recorded, parts of eastern, northern and western slopes are still not completely surveyed, which will be continued in future seasons.

The plan of the site with the recorded looting pits have been submitted to the DoA for their monitoring records. The vandalism and looting activities that took place during the excavation campaigns have been noted by the representatives present and in one case was reported to the police. However, this is just a minor reaction in the face of looting and illegal excavations of archeological sites, which cause irreparable damage to the ancient layers and the loss of valuable data. Monitoring and the recording of looting and vandalism are essential to combat looting and address the looting problem more effectively. In the meantime, empowering the local inspectors to monitor the various sites under their jurisdiction and the continuous presence of site guards would certainly help alleviate the consequences.

Conclusion and Prospects

The archaeological project of Tall Ushay‘ir, has significantly advanced our understanding of this previously unexplored site in Northern Jordan. Its strategic location and extensive fortification system underscore its historical significance, particularly during the Iron Age.

Our work so far indicates an early occupation phase during the Early Bronze Age, followed by intermittent periods of reduced activity or abandonment. The discovered Early Bronze Age pottery and architectural elements suggests potential links to broader architectural traditions in the central and southern Levant.

The 2019 geomagnetic survey and subsequent excavation campaigns have mapped and partially excavated the site’s formidable fortification system, featuring massive walls, buttresses, and a sophisticated gate complex. These fortifications and the presence of secondary defensive structures indicates a well-planned and multi-phased construction effort, during the Iron Age I.

Intramural excavations have uncovered various phases of occupation. The presence of stone-lined pits for food storage dated probably to the Iron Age III, and the evidence of a previous occupation phase dated to the Iron Age II indicate a shift in the function of the site and a change in its socio-economic structures during the last occupation phases. The extramural excavations have revealed that the site remained actively in use from the construction of the fortification in the Iron Age I well into the Iron Age IIC, as indicated by the numerous floors, collapses and subsequent reconstructions.

The preliminary findings from Tall Ushay‘ir highlight its potential to shed light on the socio-political and economic developments of the North Jordanian Plateau. Future excavation campaigns, particularly those focusing on the extensive collapse layers, further investigation of the fortification system, the intramural occupation and the earlier occupation phases promise to provide deeper insights into the site’s long-term historical trajectory and its role within the broader regional context.

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PRELIMINARY REPORT ON LA TROBE UNIVERSITY EXCAVATIONS AT THE NATUFIAN SITE OF WĀDĪ AL HĪMMAH 27, JORDAN IN 2022

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Introduction

This report describes the principal results of La Trobe University's excavations in 2022 at the Natufian site of Wādī Al Hīmmah 27 in Jordan¹. The main efforts during the season were directed at exploring a large multiple human burial in Lower Phase 4, at the base of the settlement. To provide context for the operations described here, a brief summary of prior excavations is first offered.

Wādī Al Hīmmah 27 (12,000-12,500BC) is represented solely by Early Natufian deposits, which are accessible directly below the surface (Edwards 2013a). With four, well-preserved architectural phases (Phases 1, 2, 3 and 4 - going from latest to earliest, Edwards 2013a;

Edwards 2022), the site offers a finely divided archaeological sequence for the period. Phases 3 and 4 are each divided into distinguishable sub-phases. Overall, the sequence consists of six time-slices, accumulated over some 500 years. The first series of excavations (1983-90) at the site concentrated on broad clearance of the uppermost architectural Phase 1, with a small sondage reaching the base of the settlement in Plot XX F (Edwards 2013a). Subsequent excavations at Wādī Al Hīmmah 27, effected from 2014 to 2016, concentrated on expanding clearance of the lower phases of Structure 1 in Plot XX F (Edwards *et al.* 2018a; 2018b; 2018c). In the 2014 - 2016 seasons, the underlying architectural Phases 2 and 3 were

1. Wādī Al Hīmmah 27 is located in Wādī Al Hīmmah, some 2km north of Pella, in the northern Jordan Valley (Al Aghwar Ash SHamāliyyah), in the Irbid Governate. The 2022 fieldwork season at Wādī Al Hīmmah 27 was undertaken as part of the 'Earliest Village People: the shift to sedentary life in the Natufian period' project, funded by a three-year, Australian Research Council (ARC) Discovery Project grant (DP210102250). The project is based at the Department of Archaeology and History, La Trobe University, in Melbourne, Australia. The fieldwork was undertaken with the gracious support of His Excellency, Professor, Fadi Bala'awi, and the staff of the Department of Antiquities of Jordan, under Excavation Permit 2022/69. The excavation season commenced on 10th November 2022 under Department of Antiquities of Jordan Permit No. 2022/69 and was completed on 15th December 2022. Department of Antiquities' representatives on the project were Yusuf Abu Ali, Adnan Negrish and Muhammad Dalgaboni. Jordanian house staff at Tabqat Fahḷ comprised Ahmad Thaher (project manager), Khalid Jawahiri (*chef*), Nawal Tawfiq (laundry), Salim Hmīd (house guard) and finds processors Nasr Hassan and Khalal Khashashneh. Local field excavation staff included Abdullah Ibrahim, Ibrahim Tawfiq Maadi, Khalal Khashashneh,

Saddam Khashashneh, Walīd Khashashneh, and Nasr Hassan. Tayil Ayad acted as site guard. Excavation work and analysis at Wādī Al Hīmmah 27 was directed by Phillip Edwards and undertaken by Dr Fanny Bocquentin (French National Centre for Scientific Research [CNRS], UMR 8068, Technologie et Ethnologie des Mondes Préhistorique, MSH Mondes Nanterre, France), who supervised the excavation and analysis of human skeletal remains. The field team also included Dr Brian Armstrong (surveyor, photogrammetry, 3D-modelling, University of Melbourne); Sarah Gyngell (excavation supervisor, photogrammetry, 3D-modelling, La Trobe University); Dr Aleks Michalewicz (excavation supervisor, University of Melbourne); Dr Wendy J. Reade (in-field conservation, International Conservation Services, Sydney); and Ahmad Thaher (excavation supervisor and project manager, Amman). Sereen Al Shobaki (University of Jordan) undertook drawing and Isabella Capezio (RMIT University, Melbourne) was the project photographer and video editor. Wendy Reade also conducted laboratory conservation and Dr Patrick Faulkner, University of Sydney, and project co-chief investigator) commenced an analysis of molluscs utilised at Wādī Al Hīmmah 27. Thanks are due to Dr Stephen Bourke for arranging the use of the Pella dighouse.

excavated, and the basal (Lower) Phase 4 was reached.

A number of human burials, pits and stone features were dug into the natural travertine deposits (**Fig. 1**) at the base of the site in Lower Phase 4 (Edwards *et al.* 2018a, 2018b, 2018c; Edwards 2022). By the end of the 2016 excavation period, Lower Phase 4 had been cleared to the basal travertine rock layer across the entire excavated area of Plot XX F, except for two incompletely cleared pits (Feature 32 [F. 32] and Feature [F. 35]). It was still unclear at the end of the 2016 excavation season whether the western and northern perimeters of Feature 32 had been reached, and the same uncertainty remained over the eastern boundary of Feature 35 (**Fig. 1**). Clarification of the nature of these two pits, and their possible contents, constituted the key aim of the 2022 season. It transpired that both features formed parts of a larger pit, Feature 37.

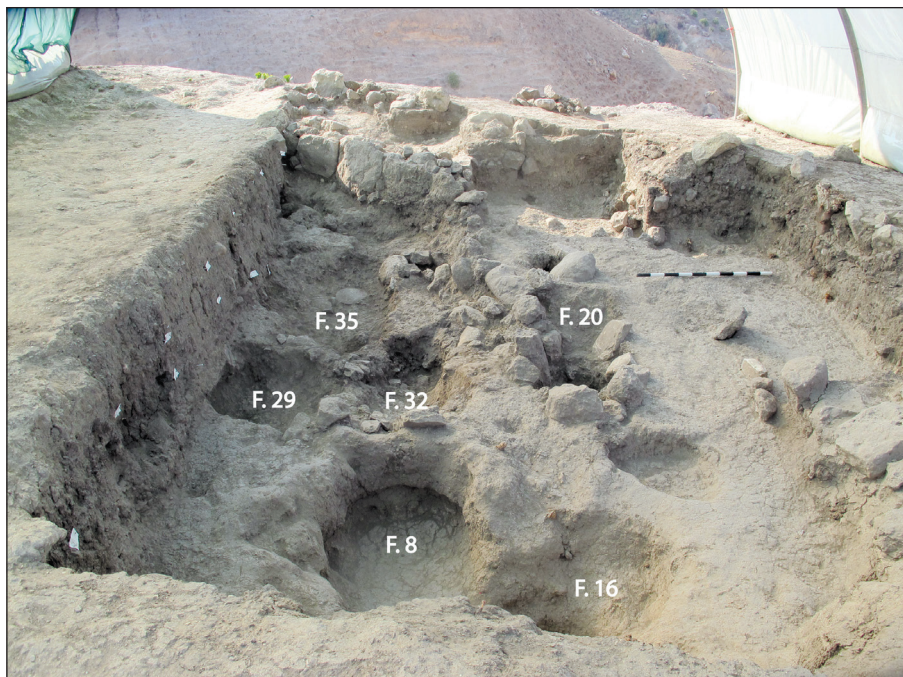
Disposition of Burials in Plot XX F, Lower Phase 4

The burials of Lower Phase 4 are clustered underneath Structure 3, a house built in the overlying Phase 3 (Edwards *et al.* 2018c). The exception is Feature 8, excavated in the 1980s, which lay outside the eastern wall of the later Structure 3 (**Fig. 1**). The pit contained a single flexed burial, *Homo 1*, anchored by a

large rock laid on its thorax. Under the later Structure 3, Feature 29 contained two primary child inhumations, with *Homo 9* overlying *Homo 10* (Bocquentin in Edwards *et al.* 2018a). Human skeletal remains were also reached in the nearby Features 32 and 35 towards the end of the 2016 season, but time limitations did not permit their complete excavation. A vertebra was encountered in Feature 32 and the pit also yielded a cluster of gracile bone points (Edwards 2018a). To the west of Feature 32, a human maxilla was found on the north-eastern slope of the pit, Feature 35. At the conclusion of the 2016 season, Features 32 and 35 were the only two archaeological deposits awaiting excavation in Plot XX F.

Excavation Methods and Artefact Processing

Operations in the 2022 season proceeded according to the same methods that have been used in previous seasons (Edwards 2013b), with some additions. Initially, backfill from Plot XX F was removed and a shadehouse erected over the project area. Excavation proceeded according to natural stratigraphy, supplemented by a square-metre grid. Sediment was dry-sieved through 1-millimetre mesh and residues were turned to the Pella is dig house, wet-sieved in a 1-millimetre mesh and dried on mats before processing by a team of local workers and foreign academic staff.



1. View west over Plot XX F, Wādī Al Ḥimmah 27 before excavation in 2022, indicating burial pit features (F. 8, F. 29, F. 32 and F. 35), and marker pits (F. 16. and F.20).

Site surveying was conducted in 2022. At this point, control points from previous seasons were employed to re-establish the site grid. All surveying work was conducted using a Leica TS-12 total station theodolite. The total station was used to record three-dimensional (3D) locations of significant artefacts and to, record stratigraphic changes and absolute elevations of each phase. In addition, a program of photogrammetric recording was established. All archaeological contexts were recorded with digital single lens reflex (DSLR) cameras, a series of overlapping photos being taken in sequence and then processed using Agisoft Metashape (Version 1.8). When combined with total station georectification, a series of highly accurate 3D models, overhead plans, orthomosaics, and digital elevation models of each phase were produced. This provides a significant resource for site visualization and ongoing archaeological and spatial analysis.

Human skeletal remains were excavated carefully and fully exposed in order to ascertain their distribution and their relationships with accompanying items. The uppermost bones were successively removed after each one was labelled with a reference number, and its location was electronically recorded. Anatomical identification, orientation, direction and dip were recorded for each bone, as was information on the state of articulation of the joints. Despite their apparent good condition during excavation, the larger remains were found to be damp, fragile and easily broken, and composed of very crumbly cortical bone. In order to preserve them, the large bones were protected from breakage at removal by consolidation *in situ*, followed by transport to the conservation laboratory.

Two consolidant solutions were tested in the field. As the soil was carefully removed from the bones with small hand tools, soft bristle brushes, or an air puffer, a 5% volume/volume solution of either neutral pH PVA in water, or 5% w/v Paraloid B72 (an acrylic co-polymer) in acetone was applied to the bone surfaces with small, soft-bristle brushes. Despite the dampness of the bones, Paraloid B72 proved the more desirable consolidant due to quick drying time and better penetration of the bones. This method of bone consolidation

during the excavation process greatly improved the preservation of skeletal elements. In the laboratory, unconsolidated bones and bone fragments, and shells were dry brushed and damp swabbed gently to remove adherent dirt. Consolidated bones were carefully swabbed with acetone to remove excess adhesive and adherent dirt. Once a bone was clean, consolidant was reapplied on all surfaces to stabilize and strengthen it prior to adhering breaks during skeletal reconstruction. Broken bones and shells were adhered with a 30% weight/volume solution of 50:50 Paraloid B72: Paraloid B67 in acetone. This mixture produces an adhesive with a higher softening point, or glass transition temperature (TG), than Paraloid B72 alone (TG = 40 degrees Celsius), meaning that the joins are more likely to withstand the high summer temperatures of the region.

The Excavation of Feature 32

Excavation in Feature 32 commenced with the removal of *Locus* 10.1, a dark greyish sediment, some 7 to 10 centimetres deep. Several burnt stone fragments were found near the top of underlying deposit *Locus* 10.2 associated with disarticulated human bones, including a partial mandible (lower jaw), a talus (ankle bone), and other scattered fragments (**Fig. 2**). Further human skeletal fragments were found near the top of *Locus* 12.2, farther west in the pit. These remains attenuated with depth, before further articulated human remains were found at much lower levels. In the north-east corner of F. 32, a pocket of *Locus* 10.2 was cleared to a depth of 24cm, revealing two sets of several articulated ribs in the underlying *Locus* 10.3 (**Fig. 3**). Further lateral excavation would have been required to follow these articulated bones, overpassing the spatial limits of Feature 32 as defined by its upper deposits. It is most likely that these remains are part of another, probably earlier feature, but this will only be determined after clearance of the higher burials and artefacts which are described below. So, investigations were suspended at this locale and attention shifted to removing sediments from Feature 35 before continuing. Excavations also explored the northern margins of the pit (*Loci* 12.1-2) and its south-eastern margins (*Loci* 8 a-b.1). In the latter area, a small, curved stone



2. View south in Feature 32, showing burnt stone fragments in Locus 10.2.



3. Detail of human rib bones, partially exposed in Locus 10.3, Feature 32.

wall had been built to mark the western side of the double interment, Feature 29 (Fig. 4). It had apparently been constructed using small stones embedded in a mortar of crushed travertine, derived from the substrate rock layer beneath the site.

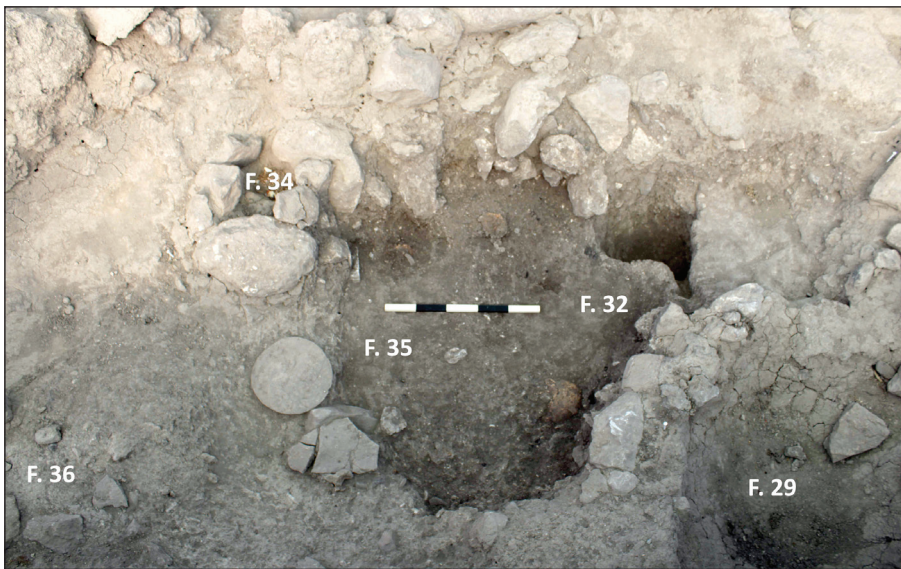
Key Finds from Feature 32

The matrix from Feature 32 included mainly small-scale lithic debris and debitage, a common pattern for the Phase 4 burial pits. Small finds in other materials comprised five bone tool fragments, which included a fragmentary tubular bead, two fragmentary bone points and a complete bone point (Registered Number [RN] 220003, see Fig. 13). These items were

accompanied by five scaphopod, or tusk shell (*Dentalium*), beads, one of which consisted of paired shell fragments. There was also a piece of worked basalt, a small, semiprecious stone, and fragments of ochre.

The Excavation of Feature 35

The sediment in Feature 35 to the west was shallower than that of Feature 32 and less organic in composition. Its excavation involved clearance of a brown sandy deposit (Locus 11.1) about 8 centimetres deep, followed by the removal of the 4-centimetre-thick Locus 11.2 underlying it; this was a greyer sediment of similar type. The western margin of the Feature 35 pit feathered out at a gentle grade, and was



4. View from the southern baulk of Plot XX F during the excavation of Features 32 and 35 in 2022. The deep context in F. 32, Locus 10.3, is located to the upper right; the discoidal limestone artefact (RN 220070) and the circular stone feature, F. 36, lie to the west margin of F. 35.

notably marked by the placement of a limestone disc (RN 220070), resembling, at first glance, one of the types of limestone plates found at the site (**Fig. 4**). Adjacent to it lay a flat limestone slab, cracked in several places.

Key Finds from Feature 35

When the circular limestone object (RN 220070) was lifted, its underside was revealed as domed and shaped irregularly into a convex mass. RN 220070 may represent a groundstone

plate or bowl abandoned in the initial stages of roughing out, rather like the unfinished basaltic artefact (RN 160420) found in Phase 3 (Edwards *et al.* 2018c: 265). Otherwise, the artefacts from Feature 35 resembled those from Feature 32, though fewer in number. They comprised two fragmentary bone artefacts, the distal end of a bone point, and a tusk shell bead.

Excavations to the West of Feature 35

Further west again of Feature 35, trowelling (in Locus 13.1) revealed an open circle of stones (Feature 36) set into a small mound of calcareous sediment (**Figs. 4-5**). This feature may have been intended as an *aide-mémoire* for the burials or other places of significance in Lower Phase 4. Similar stone cairns, embedded in raised knolls of sediment, were placed in the same place in the overlying Phases 2 and 3 (Edwards *et al.* 2018 a, b, c).



5. Detail of the circular stone feature, F. 36, embedded in calcareous sediment, Locus 13.1.

The Excavation of Feature 37: a Large Multiple Burial

After the conclusion of the 2016 season, it was neither entirely clear that the northern limit of the Feature 32 pit had been reached, nor that the southern margin of Feature 35 had been clearly ascertained. Continuing investigations clarified that F. 32 and F. 35 formed a single larger pit, which was subsequently reassigned as Feature 37. Initial excavations in the pit removed Locus 14.1, a dark-greyish-brown sediment, to a depth of 12 to 14 centimetres which was rich in charcoal fragments.

The deposit's clearance revealed that scattered, well-preserved human bones, including a protruding skull, were distributed across the area (see **Fig. 4**). Excavation of the complex was possible only by staff working in cramped, close quarters (**Fig. 6**); a key to the operation was the liaison between the conservator working beside the excavator, consolidating each fragmentary bone before it was extracted from the hard, dense sediment.

Excavation of the underlying *Locus* 14.2, a similar but somewhat softer dark-brown deposit, established that Feature 37 contained a very dense pile of comingled human remains in a fragile state of preservation. Four human skulls have been exposed so far (including the one protruding in *Locus* 14.1), overlain by a jumble of long bones, ribs, vertebrae, and feet and hand bones (**Fig. 7**). Dig progress was slow, not only because of the overlapping and intricately connected series of bone elements encased in hard, calcareous matrix, but also because of the need to carefully extract numerous bone and shell ornaments, some of which were complete or partially aligned in

primary position, suggesting that they may have been worn by the individuals at death.

Human Remains and key Finds from Feature 37

So far, 255 pieces of human bone have been identified and removed from Feature 37. All categories are present, although cranial elements dominate the assemblage. A preliminary minimal number of 8 individuals (MNI), excavated so far was determined by the maxillae and upper teeth. Among them were remains identified as 4 adults, 1 young adult, 1 adolescent, 1 child and 1 infant. Two right innominate bones measured so far are sexed at 99% probability as belonging to adult males (Bruzek *et al.* 2017). Within the main central pile of bones, no articulated joints have been found so far except a cluster of pathologically fused vertebrae and ribs. However, towards the east of the burial, below the stone-built wall of Feature 29 (see **Fig. 4**), we have started to expose a fully articulated skeleton lying on its right side in flexed position. Its cranium is touching another one from the main scattered pile, certifying a link between those two deposits, although the articulated skeleton is embedded in a different whiter and, harder sediment. The exact sequence of inhumations still needs to be resolved. Currently, whether the scattered bones from F. 37 are the result of a sole secondary deposit of dried remains or the result of successive primary deposits partly or totally dismantled as secondary manipulations is unknown. As a matter of fact, this kind of comingled assemblage is extremely rare in a Natufian context (*e.g.* Bocquentin and Garrard 2016), and our ongoing work augurs well for a highly stimulating study into these extremely complex, multi-sequenced mortuary gestures.

In terms of scattered finds, Feature 37 continued the trend from the upper *loci*, yielding small lithic debitage and debris, a semi-precious stone, fragmentary bone tools, drilled gazelle podial beads and a fragmentary tubular bone bead, and tusk shell beads. The most significant objects from Feature 37 were a range of bodily ornaments, at least some of which to judge from their close association with individual human bones, may have been worn at the time of death (**Fig. 8**). Most of the pieces



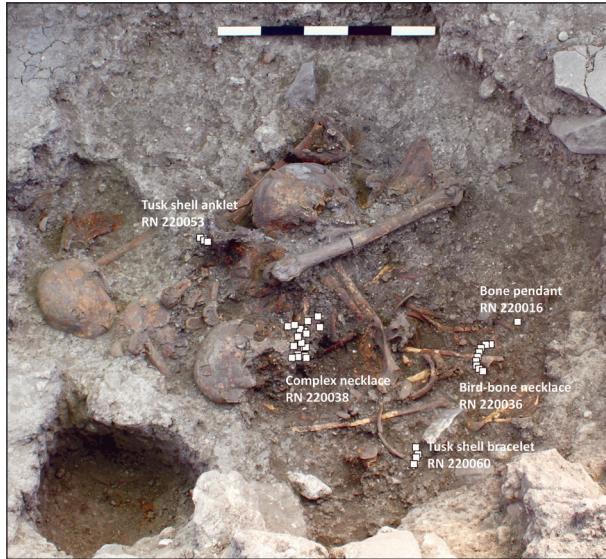
6. Excavation in Feature 37 (from left to right): Isabella Capezio, Sarah Gyngell and Fanny Bocquentin.



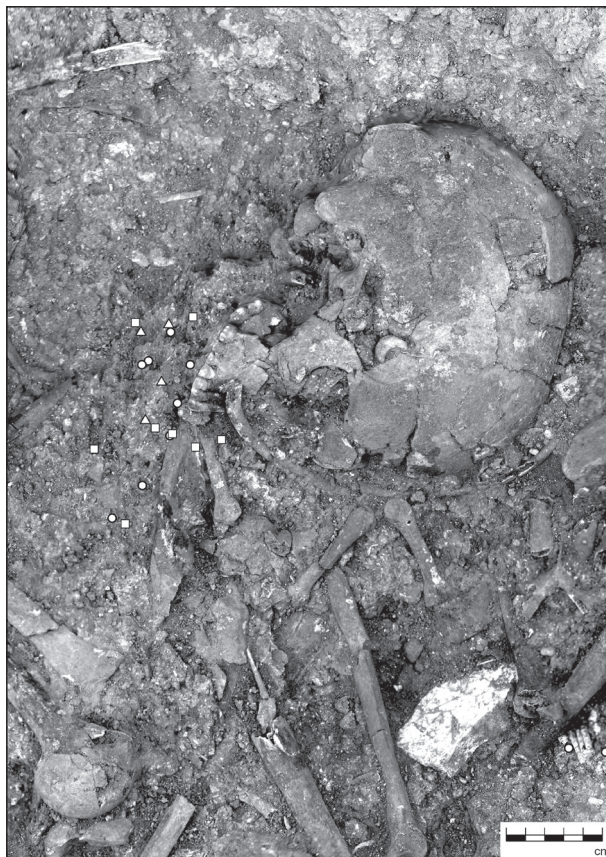
7. The multiple burial in F.37 (*Locus* 14.2) including four human crania located in the eastern half of the pit (to the left).

are composite items, but a singular item is an oblong bone pendant of a type not discovered at the site before, fashioned with suspension holes at each end (RN 220016; see **Fig. 14**).

A complex necklace of alternating types of beads was associated with one of the four



8. Location of bodily ornaments in Feature 37.



9. Constituents of necklace, RN 220038, in situ. Circle = tusk shell bead; square = gazelle phalanx; triangle = avian tibiotarsus bead.

complete crania (A086), although the primary or secondary position of the latter is not yet established. The piece included gazelle podial bones, avian tibiotarsal bone fragments, and tusk shell spacers (RN 220038). The constituents of this complex ensemble were found clustered in close association with the maxillary area of the cranium (**Fig. 9**). The kind of gazelle bones were surprising, since they included the sawn-off proximal part of the first phalanx, previously thought to have been a waster, discarded in the production of drilled distal podial beads (Edwards and Le Dosseur 2013: 270ff).

A humerus was found next to an articulated tusk shell bracelet (RN 220053), comprising five rows of beads (**Fig. 10**), still to be completely uncovered and removed. This item, which might have adorned the limb in death, was left unexcavated in 2022. RN 220060 is an articulated Tusk shell bracelet lying between several bones (**Figs. 11, 15**). A necklace of nine beads, fashioned from avian tibiotarsal



10. Articulated tusk shell bracelet (RN 220053), associated with human humerus.



11. Articulated tusk shell bracelet (RN 220060), in situ.

bone fragments (RN 220036), was found in an articulated sequence (see **Figs. 12, 16**), with preserved cordage protruding from one of the beads (**Fig. 17**). This piece is without parallel in the Jordanian archaeological record.

Surface Finds from the 2022 Season

As is often the case at Wādī Al Ḥimmah 27, notable finds were discovered on the surface during the season, having been eroded from the edge of the settlement. They include an unusually small basaltic pestle (RN 220001; **Fig. 18**) and a basalt piece (RN 220002) formed into an ovoid shape (**Fig. 19**).

Analysing the Molluscan Artefacts

As at other Natufian sites, marine molluscs held a fascination for the inhabitants of Wādī Al Ḥimmah 27, and they utilised them through the lifetime of the settlement to make a variety of bodily ornaments. But unlike at other Natufian sites, initial cataloguing through the years has revealed that scaphopods, or tusk shells, were the only varieties of marine shell imported to the settlement. In the 2022 season, a specialist archaeomalacological analysis of the shell artefacts was undertaken for the first time, and it has clarified the nature of molluscan use considerably.

Analysis of the scaphopods was focused on detailed recording of a set of morphological features for taxonomic identification outlined in previous archaeological and malacological research (e.g. Davin 2019; Kurzawska *et al.* 2013; Steiner 1992). All information was recorded in a database following observation and specimen photography using a 10-220x Dino-Lite digital microscope, with measurements obtained by



12. Necklace of articulated avian tibiotarsal bone beads (RN 220036), *in situ*.

Mitutoyo vernier digital callipers or within the DinoCapture 2.0 imaging software. The sample recorded during the 2022 season included 55 specimens recovered from earlier excavations at the site, as well as 58 specimens excavated during 2022 itself. Taxonomic identifications will need to be finalised following comparison with mollusc specimens held within Jordan.

Other marine, freshwater and terrestrial molluscs recovered from the site are also in the process of being taxonomically identified and quantified, again following the established malacological literature for the



13. Bone point (RN 220003) from Feature 32, Locus 12.1.



16. Necklace of avian tibiotarsal bone beads (RN 220036) from Feature 37, Locus 14.2.



17. Detail of cordage protruding from a bead in the necklace, RN 220036.



14. Bone pendant (RN 220016) from Feature 37, Locus 14.2.



15. Tusk shell bracelet (RN 220060) from Feature 37, Locus 14.2.



18. Basaltic pestle (RN 220001); surface find, Wādī Al Ḥimmah 27.

region (Kinzelbach and Roth 1984; Neubert 1998; Neubert *et al.* 2015). Although most of the mollusc samples likely derive from natural processes of deposition on the site, particularly the land snails and the majority of the freshwater gastropods, there were several specimens that indicate transportation, use and some modification of marine and freshwater taxa. Although highly fragmented and small in number, there is now evidence of marine bivalve (families Cardiidae and Arcidae) importation to Wādī Al Himmah 27, as well as the transportation and perforation of two marine gastropods (family Columbellidae and *Trivia* sp.). Interestingly, four freshwater gastropod shells (two *Melanopsis buccinoidea* and two *Theodoxus jordani*) that would have occurred locally also show evidence of having been intentionally perforated as a form of ornamentation.

Conclusions

Feature 37 could not be fully excavated in 2022. At the conclusion of operations, the unexcavated human bones were protected and the site was backfilled. The clearance and inventory of this important deposit now await a future field season. The assemblage of bones must be comprehensively excavated in order to understand the nature of this deposit, its timespan, how many people were gathered together here, their biological and social identity, and how the burial pit was managed over its duration. It will also be important to establish the exact southern limit of Feature 37 and how the skeletal remains found at the deep level in Feature 32 relate stratigraphically to the inhumations in F. 37 and to determine the

exact boundaries between Feature 37 and the twin inhumations in the neighbouring, later pit, Feature 29.

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19. Ovoid basaltic artefact (RN 22000); surface find, Wādī Al Himmah 27.

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KHIRBAT AL MUKHAYYAT ARCHAEOLOGICAL PROJECT: REPORT ON THE 2017 AND 2019 SEASONS

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Věra Doležálková and Grant Ginson*

Introduction

KHirbat Al Mukhayyat (hereafter Mukhayyat), also called the Town of Nebo (Piccirillo and Alliata 1998: 53–83; Saller and Bagatti 1949: 204–217), is located approximately 6km northwest of Mādabā, overlooking the Dead Sea and Jordan Valley to the west. The site is located on a steep limestone promontory that is framed by the Wādī ‘Ifrit to the east and the Wādī Al Mukhayyat to the west. Remains from a wide range of periods have been documented at and around the site, including an Iron Age fortification system, Hellenistic structures, well-preserved Byzantine churches and mosaics, and an array of tombs, caves, cisterns, and various agricultural installations.

Previous archaeological research at Mukhayyat has focused on particular occupation phases at the site (Michel 1998; Mortensen 2002, 2005; Mortensen and Thuesen 2007; Piccirillo 1988, 1989, 1993; Piccirillo and Alliata 1998; Ripamonti 1963; Saller 1941, 1966; Saller and Bagatti 1949; Schneider 1950; Thuesen 2009), and regional surveys of the Nebo region (Glueck 1935; Graham and Harrison 2001; Mortensen 1992, 1996, 2009; Mortensen and Thuesen 1998; Mortensen *et al.* 2013; Stockton 1967; Thuesen 2004) have provided a foundation for exploring the occupation history of the area. Despite these efforts, the lack of systematic excavations at the site has left a gap in our understanding of Mukhayyat’s occupational history and its role within this archaeologically and historically important landscape.

To address this lacuna, and particularly questions related to pilgrimage, subsistence economies, and borderland processes, the

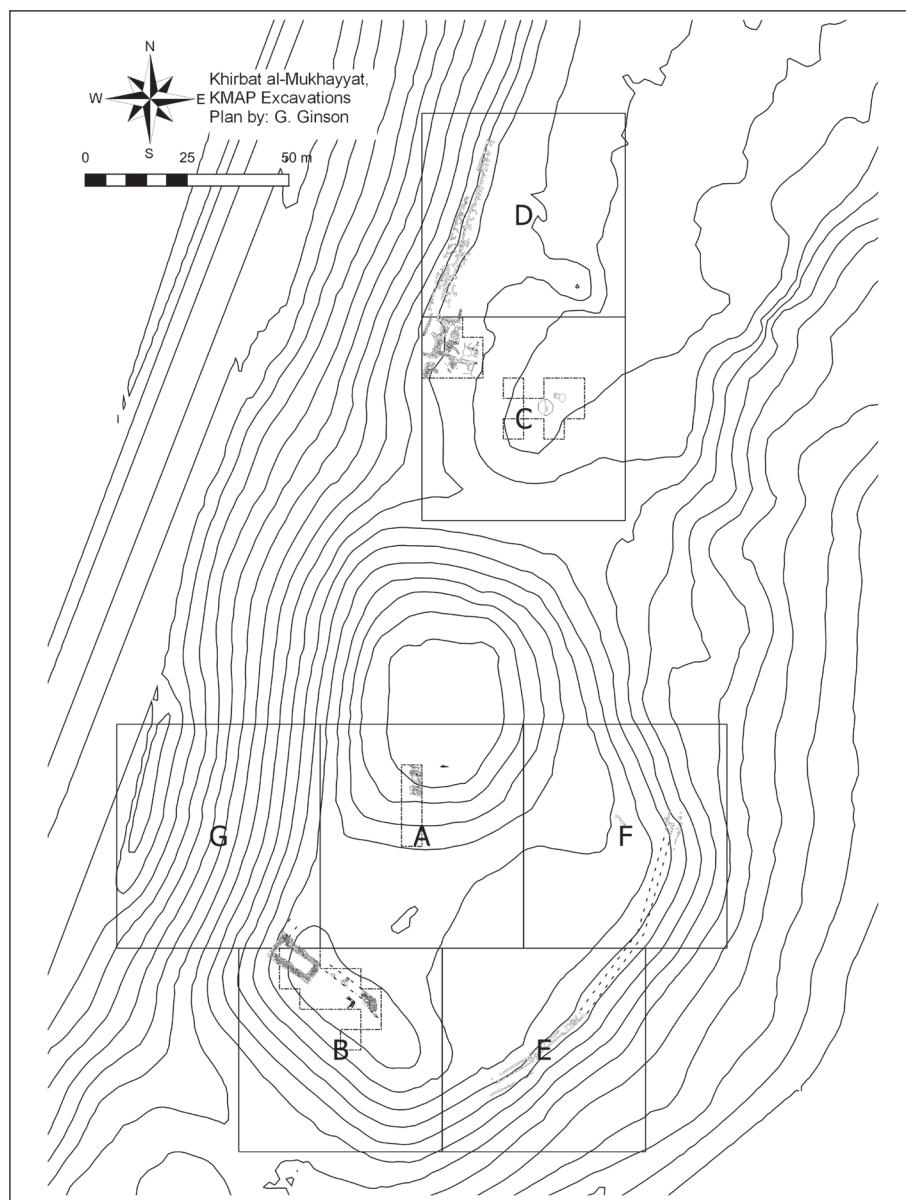
KHirbat Al Mukhayyat Archaeological Project (KMAP) was created.

Previous Excavations (2014 And 2016)

During our inaugural excavation season in the summer of 2014, three fields of excavation (**Fig. 1**) were opened: Field A on the southern slope of the acropolis, Field B on a ridge to the south of the acropolis, and Field C north of the acropolis (Foran *et al.* 2017). In 2016, excavations resumed in both Field B and Field C. Work in Field A exposed a series of retaining walls that were likely built to support the southern extension of the Church of St. George on the summit of the mound. Excavations in Field B succeeded in exposing part of a monumental structure partially built of ashlar blocks, evidence for the Iron Age defensive system, and a collection of over 40 complete Hellenistic cooking pots. Two areas in Field C were opened. In the centre of Field C, a stepped, bedrock-carved chamber was exposed. The feature was filled with ceramic vessels, stone and metal objects, and coins, indicating that it was likely used as storage. Field C West has produced some of the most intriguing remains at the site: a well-preserved Hellenistic stepped bathing installation, several plastered bedrock features associated with a stone-lined channel, and large sections of the Iron Age fortification wall that surrounded the site.

2017 And 2019 Excavation Results

The objectives of the 2017 and 2019 excavation seasons focused on Field B (**Fig. 1**), seeking to determine a full stratigraphic sequence,



1. Plan of the fields of excavation at Mukhayyat (G. Ginson).

and, to the extent possible, a clarification of the nature of activity in the area. The specific objectives of these seasons were thus to: 1) further our understanding of the cooking pot deposits dating to the Hellenistic period; 2) to more broadly expose the occupational contexts dating to the Iron Age; and 3) to clarify the overall stratigraphic sequence of Iron Age and Hellenistic activity in this area of the site¹.

As the 2019 excavations in Field B were

able to reach the earliest occupational levels in the area, located atop bedrock, a field-phasing schema for the stratigraphic sequence was implemented (Danielson and Foran 2021). Through this phasing schema, it is possible to describe the major phases of activity within this field according to their respective chronological horizons (**Table 1**). The following discussion thus uses this phasing scheme to describe the results of the 2017 and 2019 excavation seasons.

1. The 2017 season was conducted between July 4 and 31, with Debra Foran acting as Project Director and Greg Braun as Survey Director. Nisreen Fgaha, Ammel Khaled Rawaneh, and Ahmad al-Ajarmeh served as the representatives for the Department of Antiquities. The 2019 season was conducted between June 18 and July 15, with Debra Foran acting as Project Director,

Greg Braun as Survey Director, Andrew Danielson as Field Director, Věra Doležálková as Ceramic Specialist, and Grant Ginson as GIS Specialist. Kholood Agrabawi and Mansour Ka'abna served as the representatives for the Department of Antiquities. An archaeological field school for students from Wilfrid Laurier University was also run in conjunction with both field seasons.

Table 1: Field B Stratigraphic Phases.

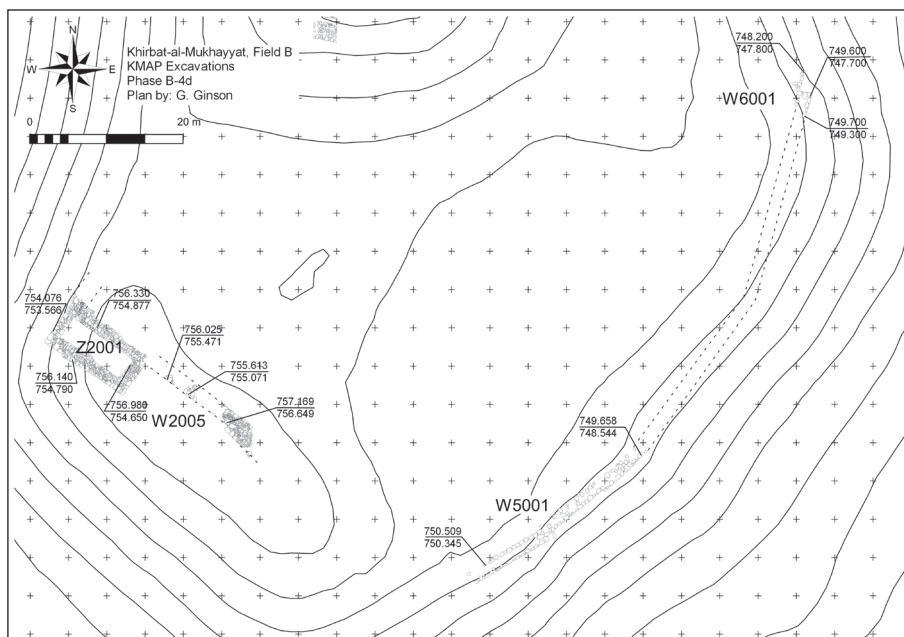
Field B Phases	Major Contexts	Period	Date Range
B-1	Surface debris, wash	Modern	20 th –21 st cent. AD
B-2	Wall W2004	Byzantine (?)	4 th –7 th century AD
B-3a	Glacis, cooking pot deposits	Hellenistic	4 th –1 st cent. BC
B-3b	Tower (Z2001) renovation, renovation to wall W2005	Hellenistic	4 th –1 st cent. BC
B-4a	Extramural surface in B26 (L24=L33)	Iron Age IIC	8 th –6 th cent. BC
B-4b	Extramural surface in B26 (L27=L36)	Iron Age IIC	8 th –6 th cent. BC
B-4c	Extramural structure (W2009 and W2010), and surface (L49) in B26	Iron Age IIB/IIC	8 th cent. BC (?)
B-4d	Fortification Wall (W2005) and Tower (Z2001)	Iron Age II	Undetermined

Phase B-4d (Iron Age II)

The earliest attested activity in Field B consists of the construction of the major fortification system surrounding the area. This system consists of a large inset-offset fortification wall (W2005), measuring approximately 3m at its greatest width and oriented northwest to southeast across the field (**Fig. 2**). This fortification wall joins a large rectangular structure, interpreted as a tower (Z2001), measuring approximately 7x12m. This tower is located on the western edge of the site, where it possessed the greatest visibility of the *wadi* systems extending to the west and the Jordan Valley. The presumed extensions of this fortification system are also visible to the east, in the adjacent Field E (W5001) and Field F (W6001), where the upper courses of the wall, including additional offsets, are visible on the surface. While this wall has been partially

exposed in a number of squares, it is best articulated in square B27 where five courses of both the northern and southern face of the wall were exposed together with an offset of the wall.

Several attempts to expose the foundations and earliest construction activity associated with this fortification system were undertaken. In 2016, a small probe was excavated along the southern face of the tower (Z2001) in square B14, and in 2017, the interior of the structure, squares B3 and B4, were excavated. Similarly, in 2017 a probe was excavated along the southern face of W2005 in B37 in an effort to expose the foundations of the wall. In each of these three areas, a complete understanding of the tower and wall foundations was unable to be realized due to the increasing safety challenges of excavating at a depth of nearly 4m, as well as the time constraints afforded



2. Phase B-4d at KHirbat Al Mukhayyat G. Ginson).

by the excavation season. Despite the lack of broader exposure of the construction phases of the wall, the excavated pottery from the lowest levels of the probes dated exclusively to the Iron II, indicating a likely date for the construction of the wall and the earliest phase of activity in Field B.

Phase B-4c (Iron Age IIB/C)

Phase B-4c is represented by a small structure, the corner of which was excavated in square B26 (**Fig. 3**). The corner of the excavated structure consists of wall W2009, oriented northeast by southwest and consisting of two rows and four courses, and wall W2010, oriented northwest by southeast and consisting of one row and four courses. Both of these walls were constructed of fieldstones in the boulder-and-chink method and were founded on bedrock. Atop the bedrock, within the corner of this structure, was a beaten-earth surface (B26:49) founded directly atop and serving to level the uneven bedrock.

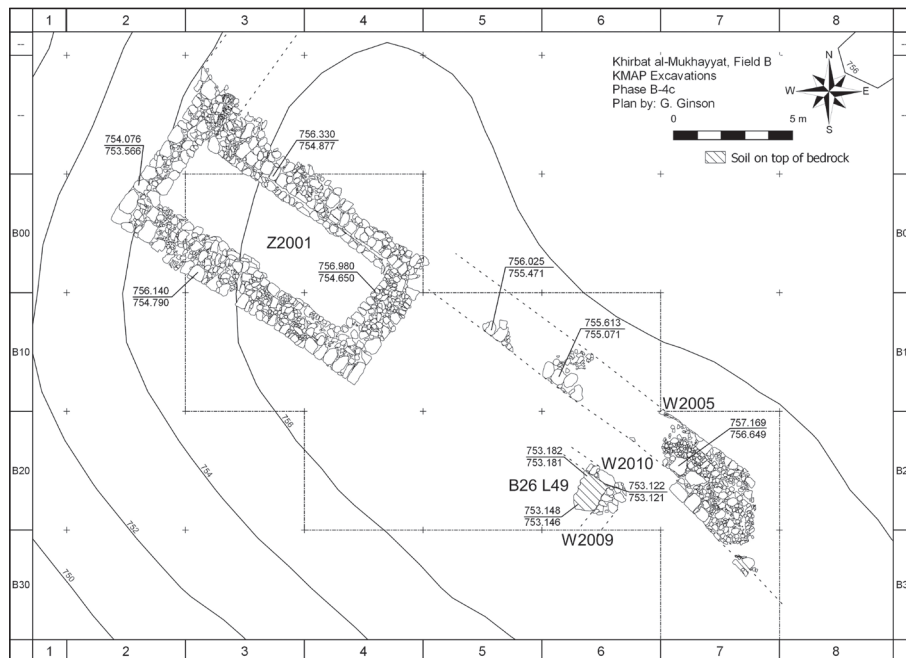
The ashy occupational debris (B26:48) excavated above this surface contained significant amounts of faunal remains and pottery (**Fig. 4, Table 2**). Above the occupational debris was approximately one meter of post-occupation debris (B26:39, 41, 42, 45, 46, 47) that contained substantial amounts of botanical and faunal remains, pottery, charcoal, and boulder tumble that presumably originated

from the upper courses of the walls of the structure (W2009 and W2010). The limited pottery excavated atop the levelled bedrock surface (B26:49) appears to date to the latter portion of the Iron Age, the late Iron IIB or Iron IIC. The pottery found in the post-occupation debris (B26:39, 41, 42, 45, 46, 47) within this structure is of an Iron IIC date.

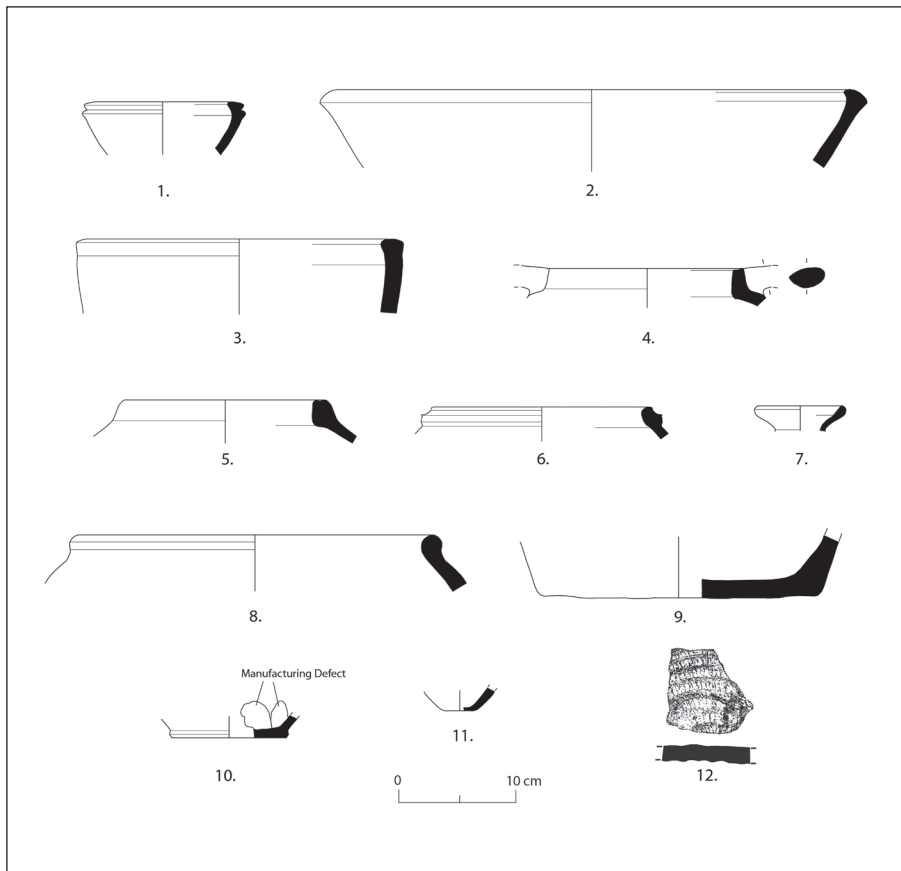
Due to the hazards of the depth of excavation in this square (approximately 4m) and the increasing instability of the northern baulk in B26, the corresponding elevations to the north of wall W2010 were not excavated. This narrow passageway between W2010 and W2005, however, would likely have functioned as an alleyway between this structure and the fortification wall (W2005). While present in only a horizontally restricted area within square B26, the Phase B-4c activity at the site presents a small extramural structure located to the south of the major fortification wall (W2005), outside of the main fortified area of the site. Within Field B, contemporaneous intramural contexts remain to be excavated.

Phase B-4b (Iron Age IIC)

Sealing above the previously described structure within square B26, a second, later, beaten-earth surface was exposed (B26:27=36). This surface covered the entirety of the earlier structure and extended across the square but was heavily disturbed at its northernmost extent



3. Phase B-4c at Khirbat Al Mukhayyat (G. Ginson).



4. Phase B-4c Pottery (see Table 2).

Table 2: Phase B-4c Pottery (see Fig. 4).

No.	Form	Context	Reg. No.	Description		
				Ext.	Int.	Core:
1.	Bowl	B26: L48	KM19.B26.92.7	light red (2.5YR 6/6), black paint (5YR 2.5/1) on upper rim	red slip (10R 5/6)	pink (7.5YR 7/3)
2.	Bowl	B26: L48	KM19.B26.92.4	pinkish white (5YR 8/2)	white (7.5YR 8/1)	gray 7.5YR 6/1)
3.	Bowl	B26: L48	KM19.B26.91.1	red (10R 5/8)	red (10R 5/8)	dark reddish gray (2.5YR 4/1)
4.	Cooking Pot	B26: L48	KM19.B26.92.2	reddish brown (2.5YR 4/4)	reddish brown (2.5YR 4/4)	reddish brown (2.5YR 4/4)
5.	Cooking Pot	B26: L48	KM19.B26.91.2	dark gray (5YR 4/1)	dark gray (5YR 4/1)	weak red (2.5YR 5/2)
6.	Cooking Pot	B26: L48	KM19.B26.92.3	red (10R 5/6)	reddish brown (2.5YR 4/3)	dark reddish gray (2.5YR 4/3)
7.	Jug	B26: L48	KM19.B26.92.6	pinkish gray (7.5YR 7/2)	pinkish white (7.5YR 8/2)	pink (5YR 7/3)
8.	Jar	B26: L48	KM19.B26.92.5	very pale brown (10YR 8/2)	pinkish gray (7.5YR 7/2)	gray (7.5YR 6/1)
9.	Base	B26: L48	KM19.B26.92.8	white (10YR 8/1)	pinkish gray (7.5YR 7/2)	gray (10YR 6/1)
10.	Base	B26: L48	KM19.B26.92.12	pink (7.5YR 7/3)	pink (7.5YR 7/3)	gray (7.5YR 6/1)
11.	Base	B26: L48	KM19.B26.92.10	red slip (2.5YR 5/6)	gray (7.5YR 6/1)	light reddish brown (2.5YR 7/3)
12.	Base	B26: L48	KM19.B26.92.9	light red (2.5YR 6/6)	yellowish red (5YR 5/6)	dark gray (5YR 4/1)

by boulder tumble originating from the collapse of the upper courses of the fortification wall (W2005) to the north (**Fig. 5**).

The material matrix of the surface (B26:27=36), and especially the ashy occupational debris atop it (B26:26=35), consisted of substantial amounts of faunal, charcoal, botanical, and ceramic material culture (**Fig. 6, Table 3**). Within the ashy occupational debris, an iron projectile point (19.039) was excavated (**Fig. 7**). The pottery from this phase dates to the late Iron Age. Phase B-4b has yet to be excavated in additional squares, a challenge in part due to its relative depth at approximately three meters below the surface.

Phase B-4a (Iron Age IIC)

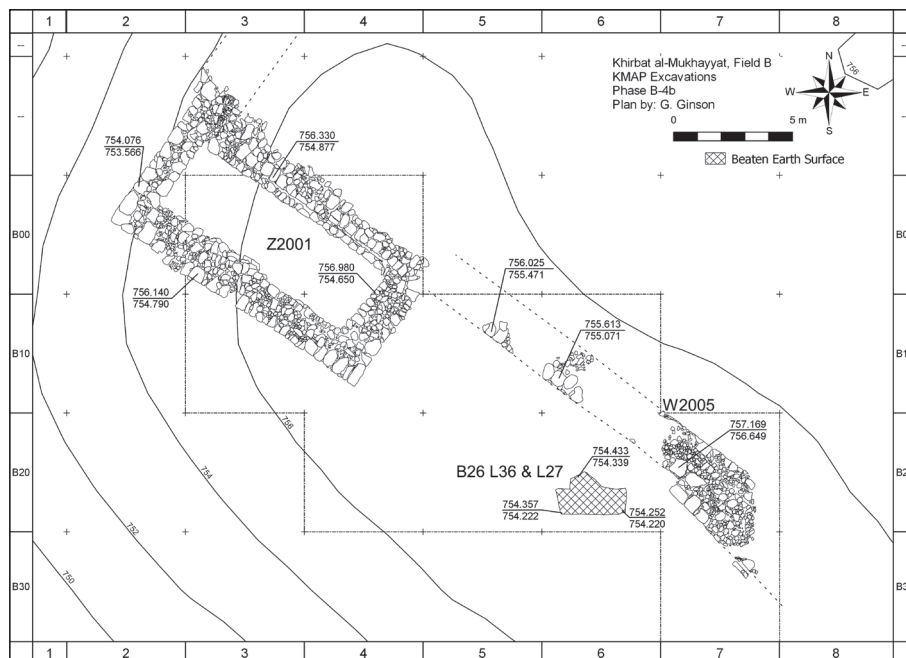
Immediately above the approximately 15cm of occupational debris of the previous phase was another beaten-earth surface (B26:24=33). This surface likewise extended across the entirety of the excavated portion of the square but was heavily disturbed at its northernmost extent by boulder tumble originating from the partial collapse of the upper courses of the fortification wall W2005 (**Fig. 8**). Atop the surface was ashy occupational debris (B26:23=32) containing charcoal, faunal remains, and pottery (**Fig. 9, Table 4**), as well the head of a broken terracotta human figurine (19.022; **Fig. 10**) and the broken fragment of the rear portion of an animal figurine (19.030), perhaps of the horse-

and-rider variety. The pottery from this phase dates to the Iron IIC.

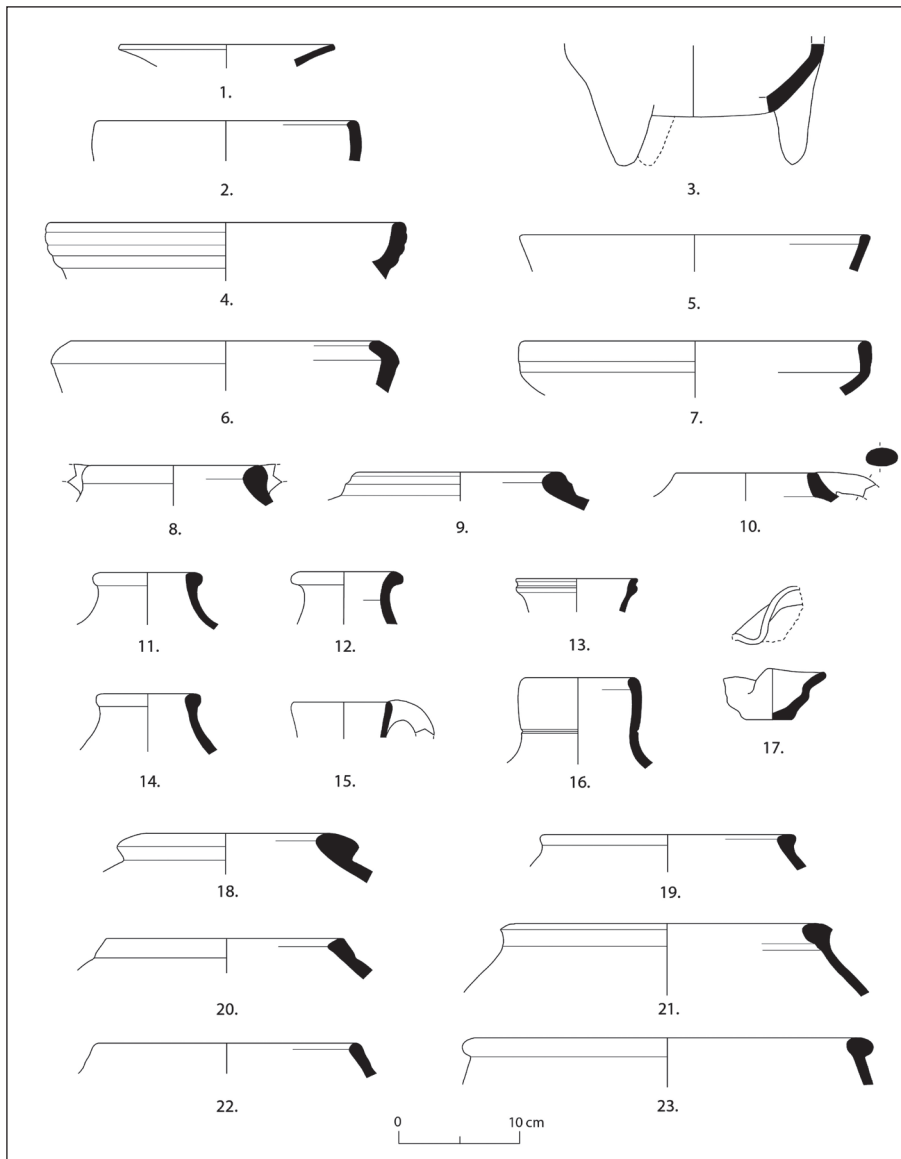
Several additional contexts identified in the 2019 excavations of B46 can be stratigraphically assigned to Phase B-4a. These contexts consisted of poorly preserved surfaces exposed in the northern extent of the square (B46:17, 22, 24) and a possible column base (B46:25). No additional architecture, however, was uncovered. Several additional beaten-earth surfaces exposed in the 2016 and 2017 seasons in square B25 (B25:25) and square B24 (B24:21) relate stratigraphically to this phase, although these were only identified in horizontally restricted probes and remain poorly understood.

Phase B-3b (Hellenistic Period)

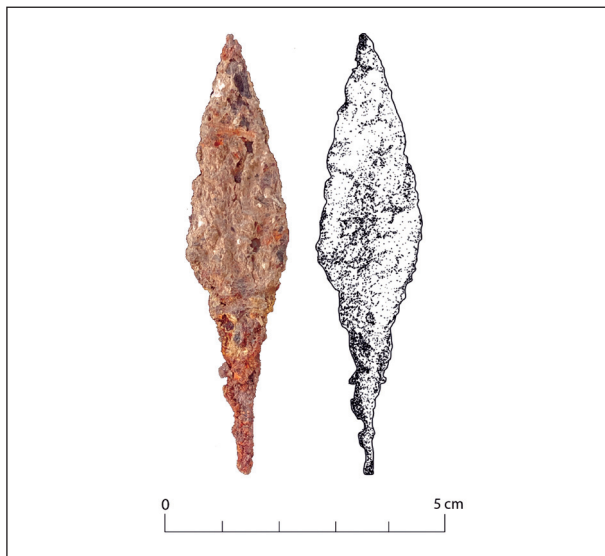
After the late Iron Age, there was a hiatus in activity in Field B until the Hellenistic period. At this time, a program of renovation of the fortifications was undertaken and is visible in the addition of several courses of bossed ashlar in the southeast corner of the earlier Iron Age tower (Z2001) and atop the fortification wall (W2005) (**Fig. 11**). This program of fortification renovation does not appear to have been completed, as it is only sporadically attested, though it is likely that later Byzantine activity at the site dismantled much of this architectural renovation. Phase B-3b is attested only in limited architectural construction activity.



5. Phase B-4b at KHirbat Al Mukhayyat (G. Ginson).



6. Phase B-4b Pottery (see Table 3).



7. Iron projectile point (19.039) from Phase B-4b.

Phase B-3a (Hellenistic Period)

Field Phase B-3a is characterized by the construction of what appears to be a large glacis extending southward from the fortification wall (W2005) and tower (Z2001). This glacis consists of successive layers of cobble and pebble fill sloping downwards toward the south from the fortifications. Buried within this glacis are dozens of Hellenistic cooking pots (**Fig. 12**) that were intentionally placed upright (**Fig. 13**). These pots do not have any cultural material within them, nor are they deposited with any other substantive material culture.

To date, more than 75 of these cooking pots have been excavated to the south of the fortification wall in Field B and may be subdivided into five major form types, all dated

Table 3: Phase B-4b Pottery (see Fig. 6).

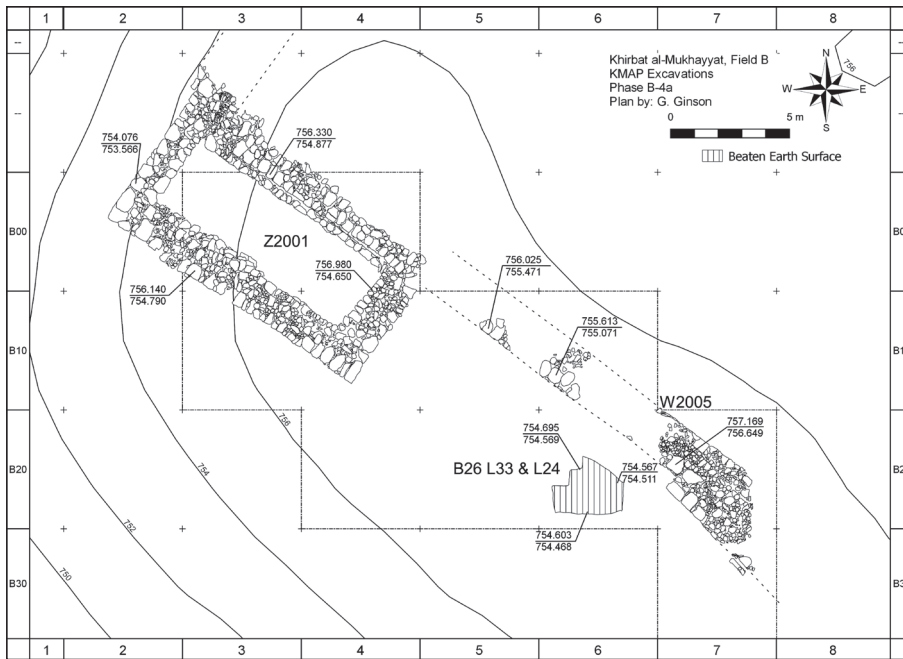
No.	Form	Context	Reg. No.	Description		
				Ext.	Int.	Core:
1.	Bowl	B26: L36	KM19.B26.73.15	light red (10R 6/6)	light red (10R 6/6)	reddish gray (2.5YR 5/1)
2.	Bowl	B26: L35	KM19.B26.69.5	light reddish brown (2.5YR 7/4)	light reddish brown (2.5YR 7/4)	light reddish brown (2.5YR 7/4)
3.	Bowl	B26: L35	KM19.B26.69.16	pinkish white (7.5YR 8/2)	pinkish white (7.5YR 8/2)	gray (7.5YR 5/1)
4.	Bowl	B26: L27	KM17.B26.55.17	pinkish white (7.5YR 8/2)	pinkish white (7.5YR 8/2)	gray (7.5YR 5/1)
5.	Bowl	B26: L27	KM17.B26.55.2	gray (7.5YR 6/1)	gray (7.5YR 6/1)	gray (7.5YR 6/1)
6.	Bowl	B26: L36	KM19.B26.73.6	pinkish gray (7.5YR 7/2)	pinkish gray (7.5YR 7/2)	gray (7.5YR 6/1)
7.	Bowl	B26: L27	KM17.B26.55.7	pinkish white (7.5YR 8/2)	light reddish brown (5YR 6/3)	gray (7.5YR 5/1)
8.	Cooking Pot	B26: L27	KM17.B26.52.3	reddish brown (2.5YR 5/4)	reddish brown (2.5YR 5/4)	reddish brown (2.5YR 5/4)
9.	Cooking Pot	B26: L36	KM19.B26.73.1	reddish brown (2.5YR 5/4)	weak red (2.5YR 5/2)	weak red (2.5YR 5/2)
10.	Cooking Pot	B26: L36	KM19.B26.73.16	light gray (10YR 7/1)	light gray (10YR 7/1)	light gray (10YR 7/1)
11.	Jar	B26: L23	KM17.B26.54.1	light reddish brown (2.5YR 7/3)	light reddish brown (2.5YR 7/3)	reddish gray (2.5YR 5/1)
12.	Jar	B26: L36	KM19.B26.73.7	pinkish gray (7.5YR 7/2)	gray (7.5YR 6/1)	gray (7.5YR 6/1)
13.	Jug	B26: L36	KM19.B26.73.18	pale brown (10YR 8/2)	pink (5YR 7/3)	pink (5YR 7/3)
14.	Jar	B26: L35	KM19.B26.69.10	pink (7.5YR 7/3)	pink (7.5YR 7/3)	gray (7.5YR 6/1)
15.	Jug	B26: L27	KM17.B26.55.18	light red (10R 6/6)	red (10R 5/6)	light red (10R 6/6)
16.	Jug	B26: L35	KM19.B26.69.6	brown (10YR 5/3)	light reddish brown (5YR 6/4)	gray (5YR 5/1)
17.	Lamp	B26: L36	KM19.B26.73.13	gray (7.5YR 5/1)	gray (7.5YR 5/1)	gray (7.5YR 5/1)
18.	Jar	B26: L35	KM19.B26.69.1	light reddish brown (5YR 6/4)	light reddish brown (5YR 6/4)	gray (10YR 5/1)
19.	Krater	B26: L35	KM19.B26.69.7	pale red (10R 7/4)	pale red (10R 7/4)	reddish gray (2.5YR 6/1)
20.	Krater	B26: L35	KM19.B26.69.2	reddish brown (2.5YR 5/4)	reddish brown (2.5YR 5/4)	reddish gray (2.5YR 5/1)
21.	Krater	B26: L27	KM17.B26.55.6	reddish yellow (5YR 6/6)	reddish yellow (5YR 6/6)	dark gray (5YR 4/1)
22.	Krater	B26: L35	KM19.B26.69.9	pale brown (10YR 6/3)	pale brown (10YR 6/3)	gray (10YR 6/1)
23.	Krater	B26: L35	KM19.B26.70.2	pink (7.5YR 7/3)	pink (7.5YR 7/3)	pink (7.5YR 7/3)

to the Hellenistic period (Fig. 14). While there is yet no definitive interpretation of the purpose of these deposits, it is possible that they served some sort of structural purpose within the glaci.

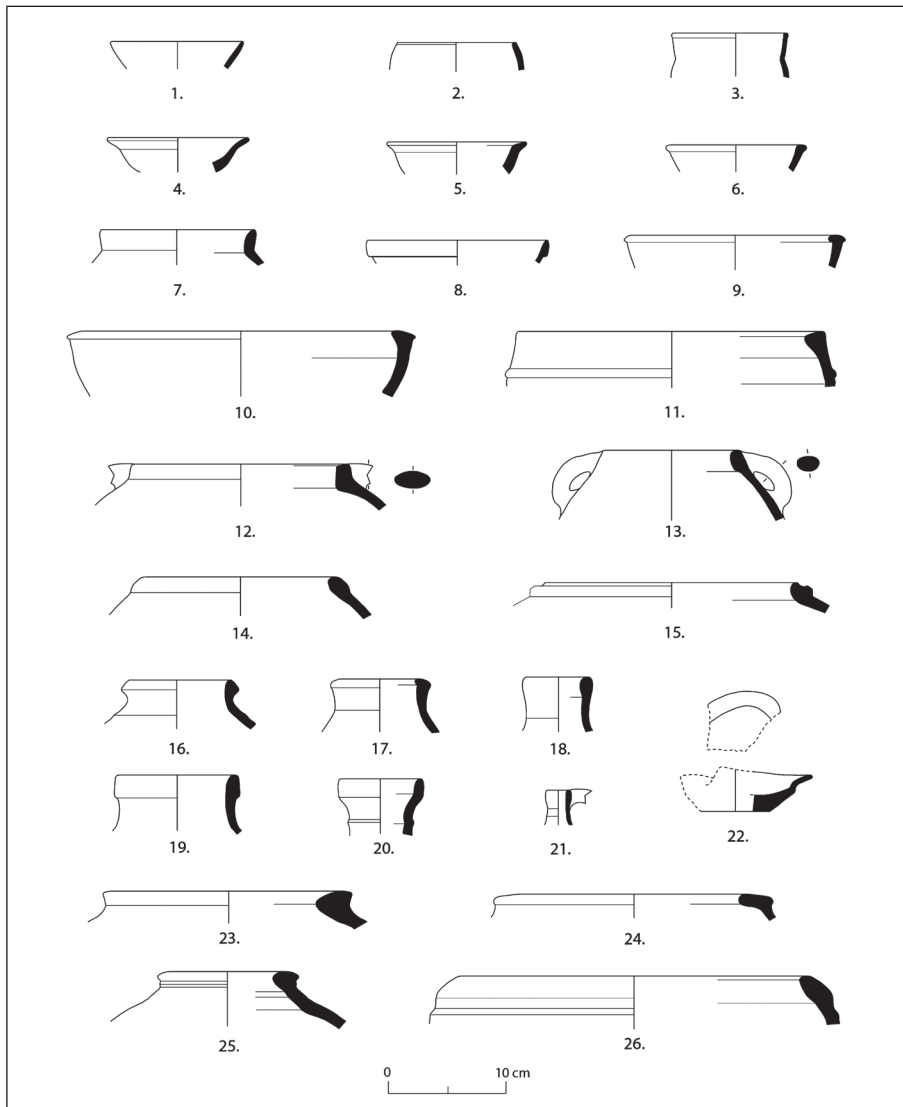
Phase B-2 (Byzantine Period)

Field Phase B-2 was encountered only in a small field wall (W2004) excavated in squares B26 and B37. This wall consisted of one to

four courses of dry-laid fieldstones (Fig. 15). No material culture associated with this wall was excavated, although, on the basis of its stratigraphic relation to the earlier Hellenistic (Phase B-3a) material and the abundance of activity at the site in the Byzantine period (Saller and Bagati 1949), it is suggested that this wall was contemporaneous with that period of activity.



8. Phase B-4a at KHirbat Al Mukhayyat (G. Ginson).



9. Phase B-4a Pottery (see Table 4).

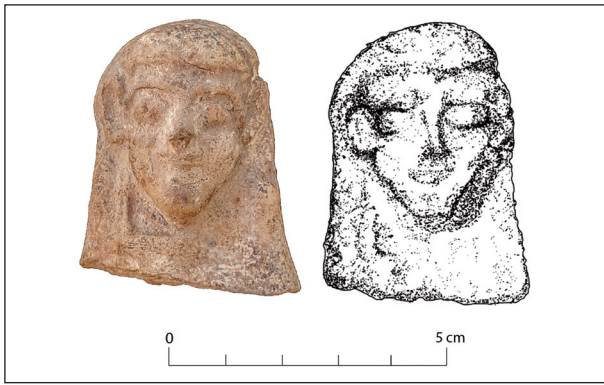
Table 4: Phase B-4a Pottery (see Fig. 9).

No.	Form	Context	Reg. No.	Description		
				Ext.	Int.	Core:
1.	Bowl	B26: L23	KM17.B26.49.16	pink (7.5YR 7/3)	pink (7.5YR 7/3)	pink (7.5YR 7/3)
2.	Bowl	B26: L33	KM17.B26.68.16	pink (5YR 7/4)	pink (5YR 7/4)	pink (5YR 7/3)
3.	Bowl	B26: L32	KM19.B26.63.3	light reddish brown (2.5YR 6/4)	light reddish brown (2.5YR 6/4)	reddish gray (2.5YR 6/1)
4.	Bowl	B26: L24	KM17.B26.53.6	dark gray (5YR 4/1)	dark gray (5YR 4/1)	dark gray (5YR 4/1)
5.	Bowl	B26: L32	KM19.B26.62.1	light red (10R 6/6)	light red (10R 6/6)	pale red (10R 6/3)
6.	Bowl	B26: L33	KM19.B26.67.6	pink (5YR 7/3)	pink (5YR 7/3)	pink (5YR 7/3)
7.	Bowl	B26: L33	KM19.B26.65.4	red slip (2.5YR 5/6)	red slip (2.5YR 5/6)	pinkish gray (7.5YR 7/2)
8.	Bowl	B26: L24	KM17.B26.50.9	black burnished slip (7.5YR 2/0)	black burnished slip (7.5YR 2/0)	black (7.5YR 2/0)
9.	Bowl	B26: L32	KM19.B26.63.7	pale brown (10YR 8/2)	reddish brown (2.5YR 7/4)	reddish gray (2.5YR 5/1)
10.	Bowl	B26: L24	KM17.B26.53.15	light red (2.5YR 6/6)	light red (2.5YR 6/6)	reddish gray (2.5YR 5/1)
11.	Bowl	B26: L33	KM19.B26.68.5	light gray (10YR 7/2)	light gray (10YR 7/2)	gray (10YR 6/1)
12.	Cooking Pot	B26: L23	KM17.B26.49.2	reddish brown (2.5YR 4/4)	reddish brown (2.5YR 4/4)	reddish brown (2.5YR 4/4)
13.	Cooking Pot	B26: L33	KM19.B26.65.1	light reddish brown (2.5YR 6/4)	light reddish brown (2.5YR 6/4)	light reddish brown (2.5YR 6/4)
14.	Cooking Pot	B26: L23	KM17.B26.48.25	reddish brown (2.5YR 5/4)	reddish brown (2.5YR 5/4)	reddish brown (2.5YR 5/4)
15.	Cooking Pot	B26: L23	KM17.B26.49.4	reddish brown (2.5YR 4/4)	reddish brown (2.5YR 4/4)	reddish brown (2.5YR 4/4)
16.	Jar	B26: L23	KM17.B26.49.24	gray (5YR 6/1)	gray (5YR 6/1)	gray (5YR 6/1)
17.	Jar	B26: L23	KM17.B26.48.8	light reddish brown (2.5YR 7/3)	light reddish brown (2.5YR 7/3)	reddish gray (2.5YR 5/1)
18.	Jug	B26: L33	KM19.B26.68.10	light gray (10YR 7/2)	light gray (10YR 7/2)	light gray (10YR 7/2)
19.	Jug	B26: L33	KM19.B26.68.6	very pale brown (10YR 8/2)	light gray (10YR 7/2)	light gray (10YR 7/2)
20.	Decanter	B26: L33	KM19.B26.65.3	light reddish brown (2.5YR 7/4)	light reddish brown (2.5YR 7/4)	pink (5YR 7/4)
21.	Juglet	B26: L33	KM19.B26.68.15	light red (10R 6/6)	light red (10R 6/6)	light reddish brown (2.5YR 7/4)
22.	Lamp	B26: L23	KM17.B26.49.1	light red (10R 6/6)	light red (10R 6/6)	dark reddish gray (10R 4/1)
23.	Krater	B26: L33	KM19.B26.65.2	pink (7.5YR 7/3)	pink (7.5YR 7/3)	gray (7.5YR 6/1)
24.	Krater	B26: L33	KM19.B26.67.9	light gray (7.5YR 7/1)	light gray (7.5YR 7/1)	light gray (7.5YR 7/1)
25.	Jar	B26: L33	KM19.B26.68.1	pinkish white (7.5YR 8/2)	light reddish brown (5YR 6/3)	gray (5YR 5/1)
26.	Krater	B26: L33	KM19.B26.67.2	light reddish brown (2.5YR 7/4)	light reddish brown (2.5YR 7/4)	light reddish brown (2.5YR 7/4)

Survey Results

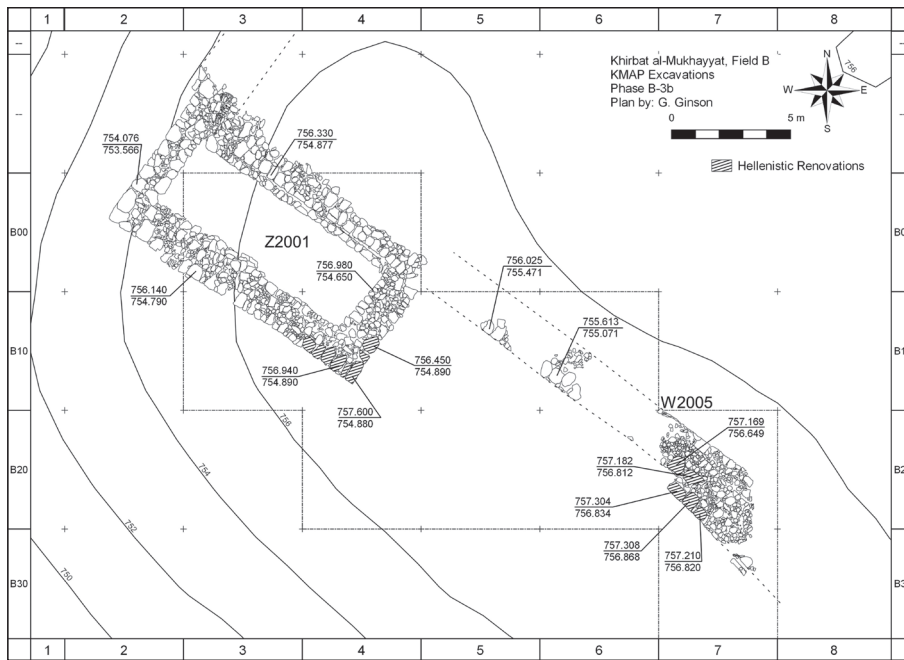
During the 2017 and 2019 seasons, limited surveys were conducted in the environs of KHirbat Al Mukhayyat, primarily in the Wādī Jadīdah to the south, with the following goals: 1)

to identify clay sources within the Mount Nebo region and collect samples for analysis; 2) to relocate and assess three Pottery Neolithic sites identified by Mortensen *et al.* (2013) during their survey of the region in the 1990s; 3)

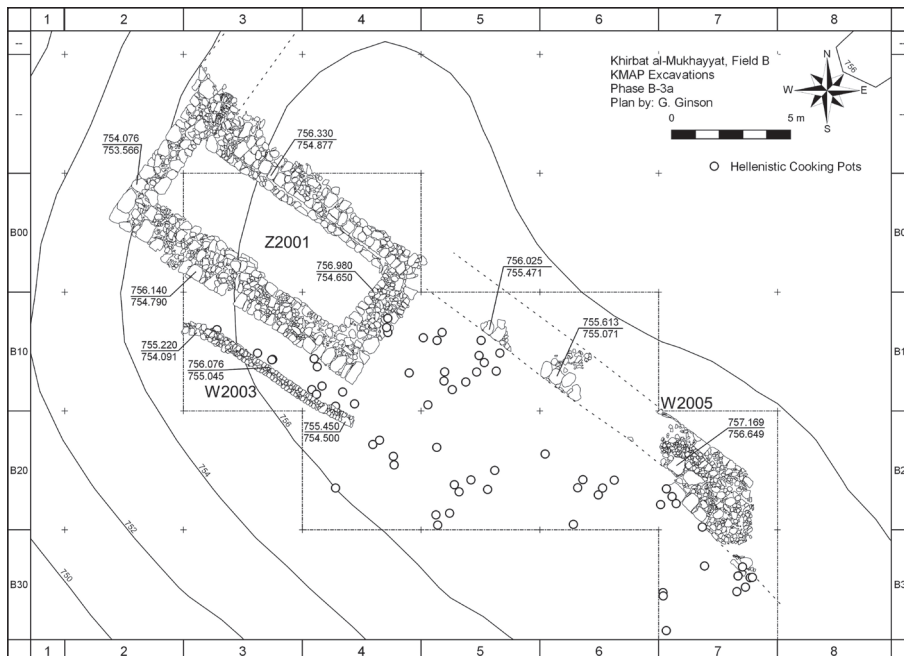


10. Ceramic figurine head (19.022) from Phase B-4a.

to assess several existing Chalcolithic/Early Bronze I sites in the Wādī Jadīdah that were identified by Mortensen *et al.* (2013) in their survey of the region of the 1990s and to collect representative diagnostic artifacts found on the surface; and 4) to document the tower structure at the Rujm Al Mukhayyat. A fifth objective, added as a result of new information acquired during the 2019 field season, focused on the salvage excavation of a cave burial in the Wādī Jadīdah.



11. Phase B-3b at KHirbat Al Mukhayyat (G. Ginson).



12. Phase B-3a at KHirbat Al Mukhayyat (G. Ginson).

Figure 1 displays five line drawings of ceramic vessels, labeled Type KMAP_CP_1 through Type KMAP_CP_5. Each drawing shows a profile view (left) and a cross-section view (right). The vessels are generally rounded with a short neck and a small handle. The cross-sections show the internal structure, including the rim and the base. A scale bar at the bottom right indicates a length of 5 cm.

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(Table 5). Clay Source 1 is a red, silty, alluvial clay found in bedrock channels and depressions in the bed of Wādī Jadīdah. Clay Source 2 is a yellow, inclusion-free clay visible in a cut bank exposure on the western bank of Wādī KHanīṣah . This clay appears to be a primary deposit, was bedded in a layer approximately 1m thick, and was underlying approximately 12m of limestone. Clay Source 3 is a dark yellowish-brown, silty, alluvial clay found in bedrock channels and depressions in the bed of a tributary of Wādī ‘Uyūn Mūsā. Clay Source 4 is a yellow, inclusion-free clay visible in a cut bank exposure on the northern bank of Wādī ‘Uyūn Mūsā. This clay appears to be a primary deposit, bedded in a layer approximately 0.75m thick and underlying approximately 15m of limestone. Clay Source 5 is a mottled yellow/green, inclusion-free clay visible in a cut bank exposure on the northern bank of Wādī ‘Uyūn Mūsā, located 10m away from Clay Source 4. This clay may be a primary clay deposit related to Clay Source 4; it consisted of a thin seam approximately 0.30m thick and was underlying approximately 15m of limestone. The collection and analysis of these clay samples is a component of continued and future research on pottery manufacture at Mukhayyat and in the broader Nebo region.

Assessment of Previously Identified Neolithic Sites

During the 2017 and 2019 season, attempts were made to relocate three Pottery Neolithic sites to assess their potential for possible future analysis.

TN2/MN423

(UTM Coordinates: 754704 East/3520442 North) At the time of its initial discovery by

the Danish survey (Mortensen *et al.* 2013), site MN423 (labelled as TN2 within the KMAP survey system) consisted of a low plateau or possibly a tell south of Wādī KHanīṣah . Visibility of the site was poor due to the presence of scrub vegetation; however, 69 artifacts consisting primarily of pottery and lithics were recovered in a 50×50m area that suggested a Yarmoukian/Jericho IX occupation (Mortensen *et al.* 2013: 121).

The area of this site was examined on July 30–31, 2017, by the KMAP team, with the goal of assessing it for possible future analysis. Several dozen artifacts were visible on the surface, including lithics and Neolithic ceramics. These artifacts were concentrated in a 50×50m area east of a concrete house and tent. Artifacts were also found eroding out of a cut on the south side of the paved road immediately to the north. Conversations with the landowner revealed that the entire site area had been bulldozed two years prior to the arrival of the KMAP team. Soil and stones from the area were deposited in a small *wadi* to the east of the plateau. Examination of these soils resulted in the collection of 19 Neolithic pottery sherds, 27 lithic artifacts, and a stone object with two pecked indentations. Three Roman sherds were also collected. On the basis of these observations, it appears that this site has been severely, if not completely, destroyed by agricultural activities.

TN3/MN329

(UTM Coordinates: 756467 East/3116315 North) At the time of its initial discovery by the Danish survey (Mortensen *et al.* 2013), site MN329 (labelled as TN3 within the KMAP survey system) consisted of a low tell north of Wādī KHanīṣah . A surface scatter of artifacts covered 30x40m; 191 artifacts were recovered, primarily pottery and lithics. A gray ashy layer was visible on the surface. The finds suggested a Yarmoukian/Jericho IX occupation. In their 2008 visit, Mortensen *et al.* found that an orchard occupied the area of MN329, which was enclosed by a low stone wall and cacti (Mortensen *et al.* 2013: 120–21).

On July 18–19, 2017, the site area was examined by the KMAP team with the goal of relocation for possible future analysis. It became apparent, however, that the area

Table 5: Clay Source Locations.

Location	UTM Coordinates*		Elevation
	North	East	
Clay Source 1	3515008	759389	509m ASL
Clay Source 2	3516007	756920	317m ASL
Clay Source 3	3520324	757682	171m ASL
Clay Source 4	3518894	758832	366m ASL
Clay Source 5	3518892	758834	365m ASL
* Datum: WGS84 UTM 36N; accuracy ±3m			

surrounding the site had been bulldozed and leveled during agricultural terracing activities. Conversations with the landowner confirmed that these activities had occurred during the previous year and were ongoing. As part of these activities, soil had been removed from the site and deposited in the adjacent *wadi*; the remaining soil was spread over the site area to a depth of 1–2m. Several non-diagnostic lithic debitage fragments were visible on the surface. Remnants of the original soil surface were visible in a narrow, discontinuous area approximately 1x20m immediately adjacent to the stone wall and paved road. Three Pottery Neolithic sherds were observed in this area. These observations indicate that MN329 has been destroyed; however, there remains a possibility that some portion of the site remains buried under 1–2m of soil.

MN526

(UTM Coordinates: 758930 East/3529280 North) Site MN526 was initially discovered by the Danish survey on what may have been a low *tall* north of ‘Uyūn Mūsā (Mortensen *et al.* 2013: 121). From MN526, 38 pottery and lithic artifacts were initially collected, and, similar to the above sites, the finds suggested a Yarmoukian/Jericho IX occupation. This site was reported as partially or completely destroyed by ploughing and agricultural activities and was located within an orchard (Mortensen *et al.* 2013: 121). Attempts were made to relocate this site on July 20, 2017. At this time, the landowner refused to give permission to enter his property, and we were therefore unable to access the site area.

Site Assessments

During the 2017 and 2019 seasons, assessments were made at previously identified sites for their potential for future analysis. While conducting these assessments, the KMAP survey team identified and recorded additional sites.

TN1 (*Dhib Yaqub*)

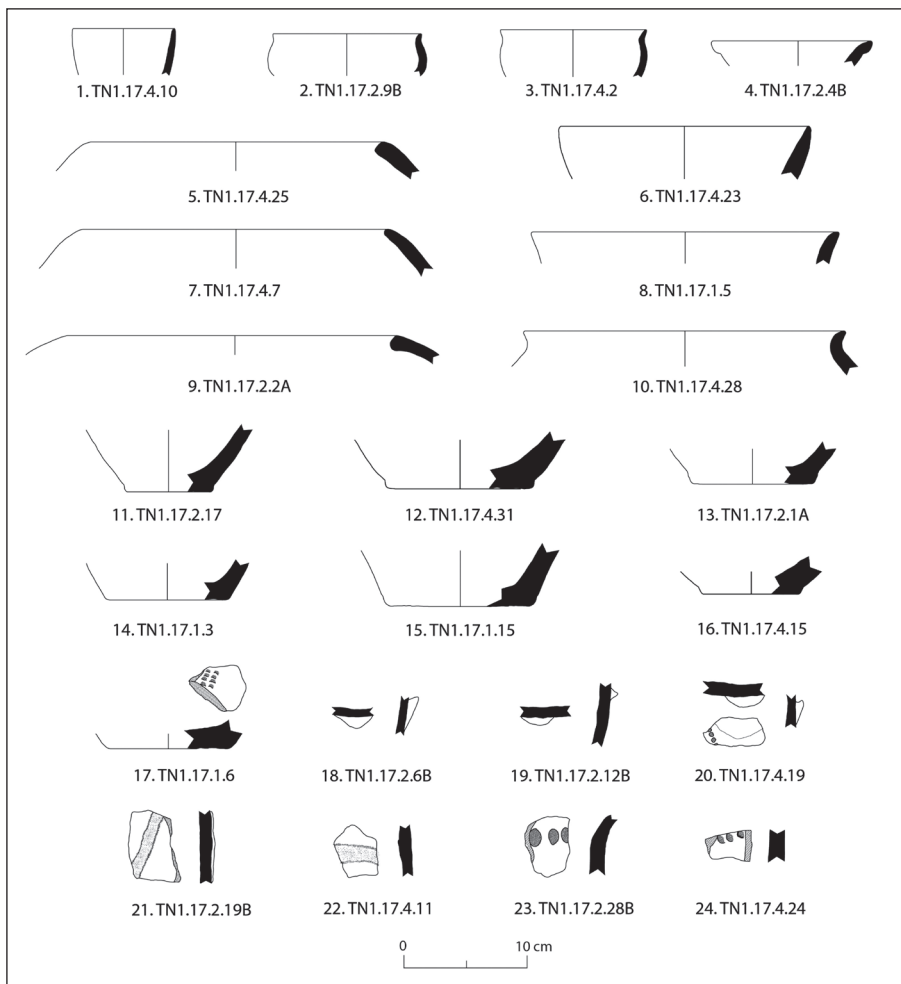
(UTM Coordinates: 758749 East/3515370 North) During the 2017 season Site TN1 was identified. The site consists of an artifact scatter containing an estimated 1,500 artifacts

on a terrace above the western bank of the Wādī KHanīṣah Jadīdah. This terrace slopes severely down to the north and east, and rises gradually to the south for 120m, whereupon it rises dramatically as it meets a short vertical rock face that forms a plateau overlooking the terrace. Several Bedouin graves, marked by stones, are located on the eastern edge of the site. An elevated area, approximately 30x15m in size, is located in the eastern half of the site and contains several large, worked stones and numerous unworked large cobbles; it is possible that these stones represent a kind of architectural feature. There is a collapsed dolmen 30m to the southeast.

The site is located in an active agricultural field, most recently planted with wheat. The landowner has indicated that this area has only recently been cleared and cultivated, and examination of uncleared areas around the site suggests that, prior to these activities, the surface visibility was very low, such that it could not be identified during the Mortensen *et al.* survey (2013; 2019). The artifact scatter measures 86x81m, encompassing the majority of the terrace. The area it covers is mainly level, sloping slightly down to the *wadi* to the north and northwest, and sloping moderately immediately to the east of the mound. A total of 221 culturally or temporally diagnostic artifacts were collected from the surface. The 105 pottery sherds recovered include a cornet (Fig. 16.1), bowls (Fig. 16.2–3, 6), a possible bottle (Fig. 16.4), jars (Fig. 16.5, 7–10), bases (Fig. 16.11–17), ledge handles (Fig. 16.18–20), and body sherds (Fig. 16.21–24). Based on a preliminary analysis of these artifacts, this site dates primarily to the Chalcolithic/Early Bronze I periods and may therefore be contemporary with site TN7 (Conder’s Circle), located 600m to the southeast. A preliminary examination of the lithics suggests that there may be a Paleolithic component to this site, although analysis is ongoing.

TN5

(UTM Coordinates: 758579 East/3515637 North) During the 2019 season, site TN5 was discovered. This site is located on a terrace to the north of ‘Ayn Jadīdah, approximately 850m northwest of Conder’s Circle. The northern and



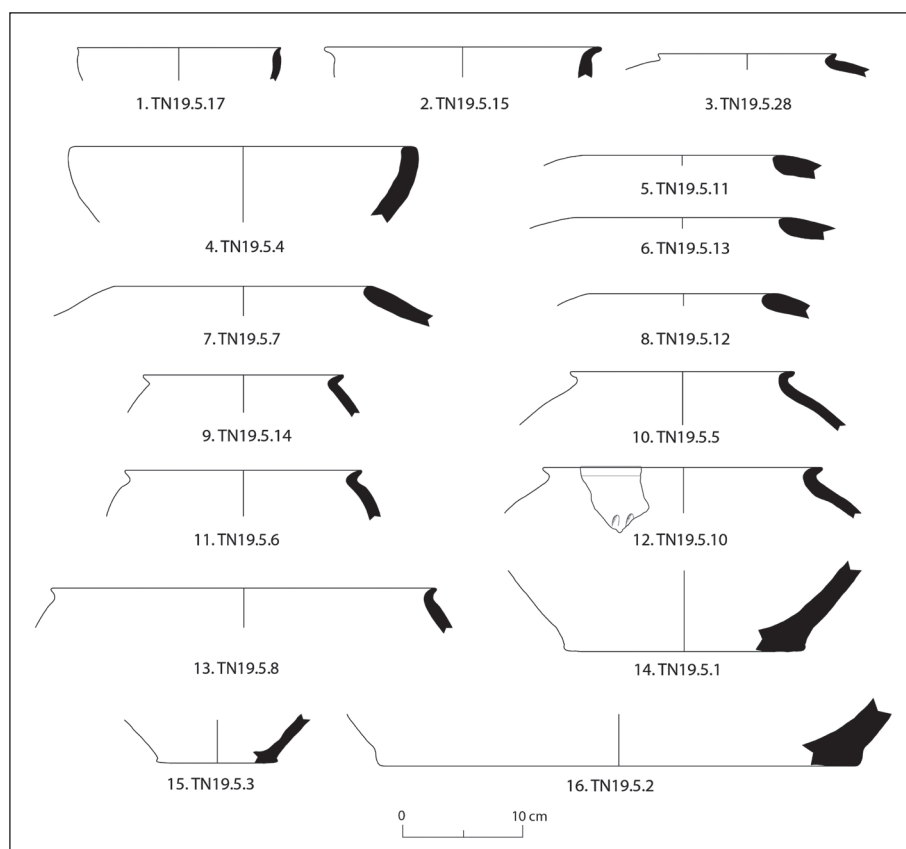
16. Pottery collected from TN1.

southern boundaries of the site are delineated by a paved road and dirt track, respectively. While no additional cultural materials were found north of the road, artifacts were found eroding out of a cut along the dirt track to the south, indicating that the southern portion of the site has been impacted by ongoing levelling of the track and ongoing agricultural activities. This site was previously identified during the surveys of Mortensen *et al.*; however, the results of this work have not yet to be published, and the site has not been entered into the MEGA-Jordan database (Thuesen 2019, personal communication). The site consisted of a diffuse artifact scatter measuring 40x150m, within which was an area of higher artifact concentration measuring 30x50m. Thirty-eight diagnostic pottery sherds and chipped stone tools were recovered from the surface of the site and retained. The pottery includes bowls (Fig. 17.1, 4), jars (Fig. 17.2-3, 5-13), and bases (Fig. 17.14-16). Preliminary examination

of these materials indicates a late Chalcolithic/ Early Bronze I occupation. Further analysis of the material culture is ongoing.

TN6 (Rujm Al Mukhayyat)

(UTM Coordinates: 760377 East/3515373 North) Known locally as Rujm Fadīl (رجم فضيل), the Rujm Al Mukhayyat is located on a hill approximately 600m to the southwest of KHirbat Al Mukhayyat, separated from the site by the Wādī KHanīṣat 'Ifrit. The site was systematically excavated in the 1960s by the University of Caracas, but the results of the excavation were not published, and the location of the excavated material culture is unknown. A preliminary attempt to map the site was conducted by the Studium Biblicum Franciscanum, but no pottery or material culture was collected (Benedettucci and Sabelli 1998). In 2019, the KHirbat Al Mukhayyat Archaeological Project survey team investigated the Rujm to create an accurate plan of the site,



17. Pottery collected from TN5.

to aid in its identification, and to conduct a surface survey of pottery to clarify the date of the structure.

During the survey, overhead images were taken using a telescopic stadia rod and a mounted Canon PowerShot 100 camera from which to generate a georeferenced photogrammetric model using RealityCapture. Using this program, a georeferenced plan was extracted from an orthophoto that was integrated with a scaled field drawing (Fig. 18).

The structure measures approximately 20x20.5m and consists of a series of casemate rooms surrounding a central courtyard area. No entrance to the structure is visible from the surface. In some areas, the extant walls survive to almost 2m in height and consist of five to six courses. Formal similarities to this structure can be found at Rujm Al Hīnū East in the ‘Ammān region (McGovern 1983: 107; Clark 1983) and at Tall As Sa‘īdiyyah Stratum III (Tubb and Dorrell 1994: fig. 2), as noted by Benedettucci and Sabelli (1998: 130–131). On the basis of these structural parallels, a late Iron Age date or perhaps early Persian period is appropriate. During the survey, very few pottery sherds

were encountered. In total, thirty sherds were collected for macroanalysis, of which nine were diagnostic. Following analysis, the sherds were returned to the site. While the pottery assemblage was limited, the few exemplars analyzed appear to support a late Iron II/Persian period date (Fig. 19).

TN7 (Conder’s Circle; MNI)

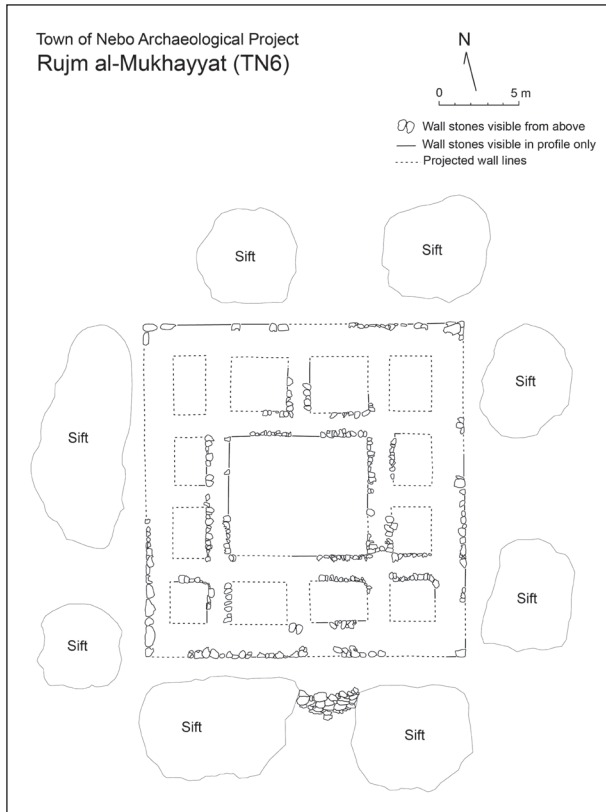
(UTM Coordinates: 759169 East/3515003 North) TN7, better known as Conder’s Circle, is located on a terrace overlooking ‘Ayn Jadīdah. The site was partially excavated in the course of the Danish survey (Thuesen 2009; Mortensen *et al.* 2019: 88–90, 94–102) and was reassessed by the KMAP team in 2017 and 2019. Thirty-one diagnostic pottery sherds and chipped stone tools were recovered from the surface of the site and retained. The ceramics include bowls (Fig. 20.1,4), jars (Fig. 20.2-3,5-8,10-13), a krater (Fig. 20.9), bases (Fig. 20.14-15), and ledge handles (Fig. 20.16-18). Preliminary examination of these materials supports the late Chalcolithic/Early Bronze I occupation identified by Thuesen (2009) and Mortensen *et al.* (2019: 88–90).

During the examination of the site in 2017, it became apparent that several tombs along the southeastern portion of the site had been illicitly excavated, and one tomb in particular had been recently looted, as there was no erosion in the

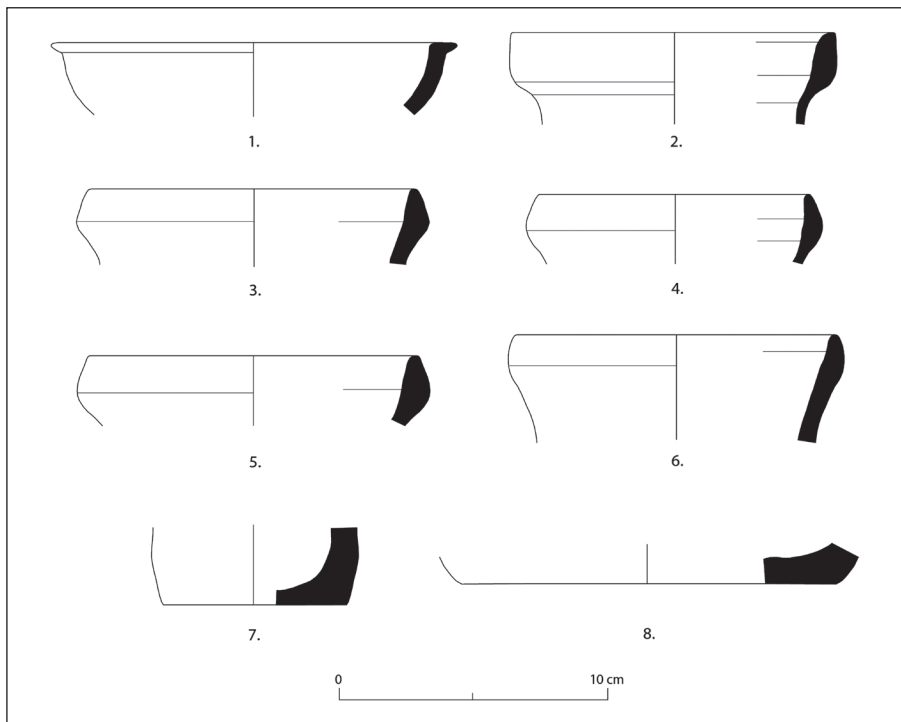
adjacent spill pile. This tomb appears to have been a natural cave that had been enlarged, with an opening measuring approximately 1m in diameter, below which was a chamber approximately 3m in diameter. Four short lobes or niches extended radially from the central chamber. Both the chamber and the niches were partially filled with rock and soil, preventing any detailed measurements. Human remains were found scattered about the cave interior, with no other artifacts visible on the surface. A subsequent visit to the site in 2019 revealed that an additional four cave burials had been looted after 2017, and human remains were found in or around these tombs. In one case, looters excavated a cave passage that extended 10m into the hillside, with the volume of the spill pile outside the cave entrance suggesting that it had been a well-planned, organized, multi-day undertaking.

Salvage Excavations at TN4 (Mughur Abū GHanīmah)

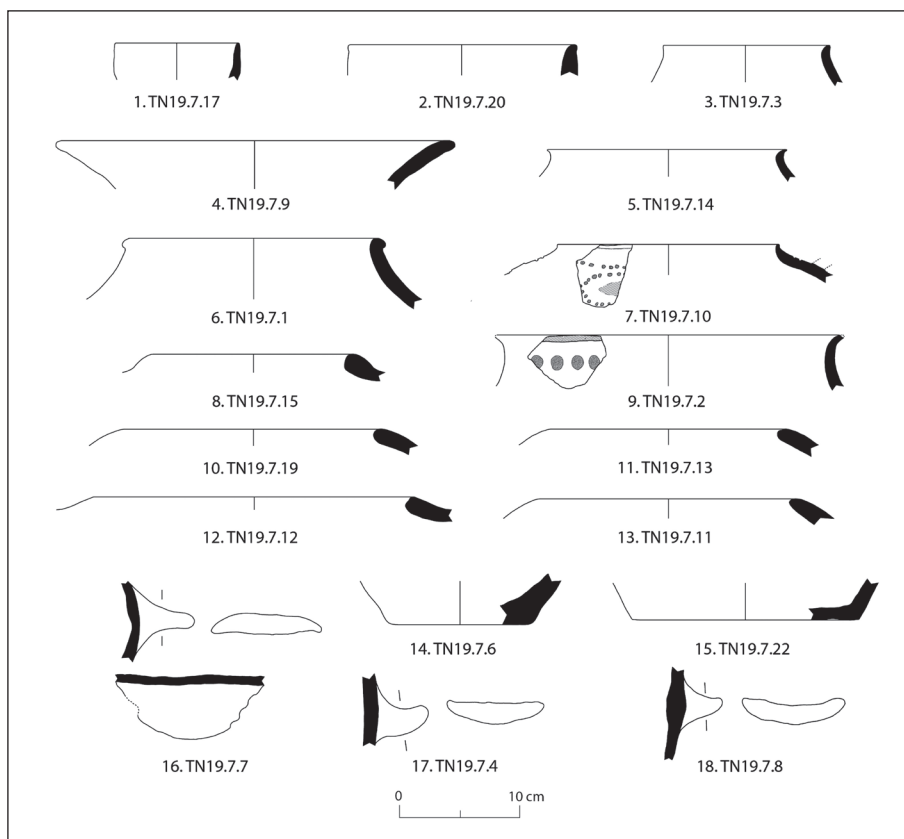
In June of 2019, in consultation with the local landowner, Mr. Ali Mohammed Abu-Ghanem, and Mr. Bassem Mahamid, Director of the Madaba Archaeological Directorate, it was determined that salvage excavations needed to be conducted on a cave tomb in the Wādī Jadīdah that was currently being looted. Initial



18. Plan of the Rujm Al Mukhayyat (G. Ginson).



19. Pottery collected from Rujm Al Mukhayyat (TN6).



20. Pottery collected from Conder's Circle (TN7).

inspection of the cave tomb by the KMAP survey team revealed the remains of several individuals, with some deposits remaining intact.

The cave itself is located on the south side of 'Ayn Jadīdah, approximately 4m above and 15m south of the *wadi* bed. It consisted of a broad opening measuring 5m wide and approximately 2m high, leading 2.5m deep into an almost vertical face of limestone cobble conglomerate bedrock (**Fig. 21**). Above the cave opening there is a slight overhang in the rock face. In the central portion of the cave, human remains were visible scattered about the surface. The cave extended east approximately 3m through a narrow passage into bedrock and west approximately 5m to through a broad passage. Within the side chambers, vertical space ranged between 0.3–0.5m, with little disturbance of their soil deposits that reached nearly to the roof of the cave.

The objectives of the salvage excavation of TN4 were twofold: 1) to recover any human remains and extant artifacts from intact and/or disturbed deposits in TN4; and 2) to document the depositional sequence of the cave. It was

apparent that the limestone cobble conglomerate that formed the walls and ceiling of the cave was inherently unstable, with a risk of large cobbles falling into the cave. For reasons of safety, excavation was limited to the looted areas immediately adjacent to the cave mouth.

In the vicinity of TN4, numerous natural and artificially enlarged caves were apparent on both sides of the Wādī Jadīdah. Of particular note is TN8, a previously unknown burial cave immediately across the *wadi* from TN4 (Mughur Abū GHanīmah). The opening to TN8 was almost completely filled with sediment, but inside were the human skeletal remains of several individuals, with no apparent evidence of disturbance.

Recovered Materials

A preliminary examination of the human skeletal remains suggests that the recovered material represents a minimum of four individuals. An examination of the teeth and jaw fragments indicates the presence of at least one child under the age of 10 years. Other elements, particularly vertebrae, show pronounced degeneration and lipping of articular

surfaces, suggesting a relatively advanced age. No evidence for sexual differentiation was identified. At this preliminary stage, it is reasonable to assume that the recovered skeletal remains comprise at least four individuals and include both children and adults. Fifty-four objects related to personal adornment were recovered during excavations, including several glass and amber beads. A bronze chain and clasp fragment that appear to be Byzantine in date were also recovered (Fig. 22).

Summary

Within the excavation area, intact cultural deposits approximately 30cm deep were excavated. Activities were restricted to portions of the cave where collapse and/or rockfall seemed unlikely. The areas west of the baulk were abandoned after a partial ceiling collapse was triggered by a second looting attempt.

The stratigraphy of these deposits suggests



21. Entrance of Mughur Abū GHanīmah (cave TN4) before excavation.



22. Finds from cave TN4.

that sediments were transported during flooding of the plateau above and came into the cave through subterranean fissures. Pottery sherds found in these sediments show strong evidence of hydroturbation and were carried into the cave with these sediments. Human remains comprising at least four individuals were recovered, including children and adults. Additional human skeletal material is still present in inaccessible portions of the cave. The paucity of smaller bones such as tarsals, carpals, phalanges, *etc.*, as well as an absence of any articulated elements, suggests that these deposits represent a series of secondary burials. As the cave gradually filled with sediments, these skeletal remains were buried.

Conclusions

The 2017 and 2019 seasons of excavation and survey for the KHirbat Al Mukhayyat Archaeological Project were successful in attaining a full stratigraphic sequence for Field B at KHirbat Al Mukhayyat. The Hellenistic phase is characterized by renovations to the earlier Iron Age defensive architecture. During the Iron II period, the inhabitants of Mukhayyat first built a series of defensive structures that dominate this raised area to the south of the acropolis. At the end of the Iron IIB, the settlement began to grow beyond the confines of the defensive wall and a small structure was built against the exterior façade of the wall. During the Iron IIC, this structure fell out of use, yet the inhabitants continued to use this extramural area but perhaps not for permanent habitation.

The survey work conducted during the 2017 and 2019 seasons has also allowed us to investigate the nature of human occupation in the larger region throughout antiquity. The valleys to the south and west were used extensively in the Late Chalcolithic and Early Bronze I periods not only for habitation but also for burial and ritual activity. During the late Iron IIB and Iron IIC, the settlement at Mukhayyat had extended beyond the defensive walls at the site. This expanded city, however, appears to pre-date the defensive structure (Rujm Al Mukhayyat) on the neighboring hill to the east. In the Byzantine period, the monastic institutions of the region may have used some of the natural caves of the area to bury their dead.

Ongoing excavations at KHirbat Al Mukhayyat will hopefully focus on continuing and expanding excavations in Field B in order to clarify the extent and nature of the Iron Age and Hellenistic defensive system in this area of the site and their relationship to other, contemporary remains elsewhere on the site. Future excavation and survey seasons will be devoted to elucidating the relationship between KHirbat Al Mukhayyat and its environs throughout antiquity.

Acknowledgements

The 2017 and 2019 seasons were conducted in collaboration with the Department of Antiquities of Jordan, which provided guidance and access to field equipment. The results described in this report would not have been possible without the dedicated help of the former Directors General of the Department of Antiquities, Mr. Yazed Elayan and Dr. Monther Jamhawi, and the former Director of the Madaba Archaeological Directorate, Mr. Basem Mahamid. These field seasons were made possible in part through funding from the Office of the Dean of Arts at Wilfrid Laurier University, the Archaeology Centre at the University of Toronto, an Alan D. Leve Graduate Research and Travel Grant (UCLA), an International Institute Fieldwork Fellowship (UCLA), a Harry and Yvonne Lenart Graduate Travel Fellowship (UCLA), and a Strange and Midkiff Families Excavation Fellowship (ASOR). The authors would like to thank the American Center of Research for their continued support. The authors are also indebted to the dedicated staff and students of the KHirbat Al Mukhayyat Archaeological Project, in particular Ashley Paling, Célynn Mathieu, Christine Sylvester, and Lara Curasev.

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PRELIMINARY REPORT ON 2022 SEASON OF EXCAVATIONS AT KHIRBAT AṢ ṢAFRĀ

Paul Gregor, Robert Bates, Constance Gane, Trisha Broy, and Paul Ray

Introduction¹

Andrews University conducted its fourth season of archaeological excavations at KHirbat Aṣ Ṣafrā between May 11, and June 7, 2022. The excavations were directed by Paul Gregor of the Institute of Archaeology at Andrews University, with Robert Bates, Constance Gane and Trisha Broy as Field Supervisors. About thirty-seven faculty, students and volunteers

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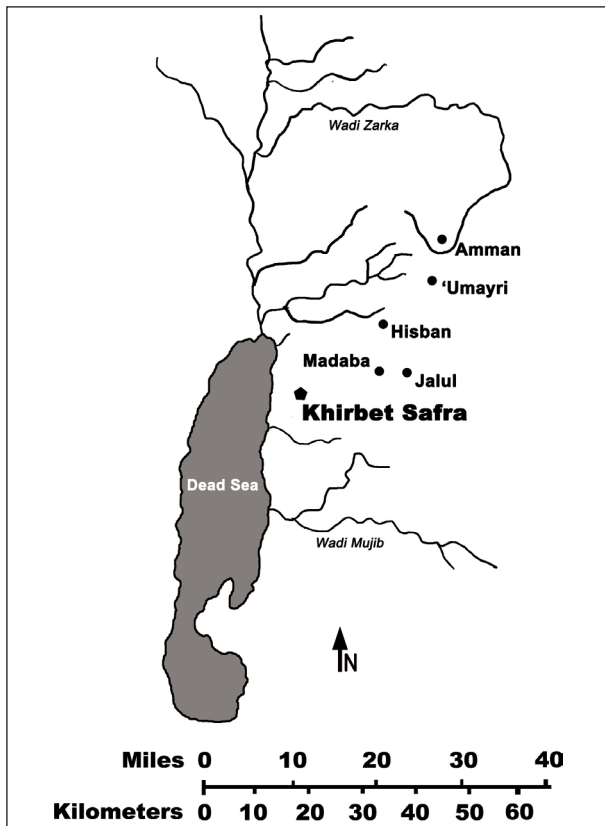
Staff for the 2022 season included Paul Z. Gregor as director. Elizabeth Emswiler served as object registrar, with the help of Stefanie Elkins-Bates, Jeffrey Hudon, Daliyah Hudon, and Nathanael Hudon. Trisha Broy served as pottery registrar. Robert Bates served as technical advisor, dealing with the electronic database and iPad issues. The Square supervisors for Field A were Roy Gane, Jeffrey Hudon, Oliver Glanz, David Jones, Kaitlyn Satelmayer, and Kiersten Zeike; for Field C they were Hala Ajilat, Eva Glazer, Aleksandra Jovanovic, and Charis Denton, and for Field E they were Elizabeth Emswiler, Arthur Viola, and Christian Teal. Volunteers included Daliyah Hudon, Nathanael Hudon, Melek Jones, Warren Johns, Dolores Antunica, Dalibor Jovanovic, Katherine Hesler, John Hargy, Scott Hill, Mairi Broy, Steve Huey, Sussie Stanley, David Johnson, Holly Singletary, Seo Dongbin, Hugo Villalobos, Soomin Kim, Jong Kim, John Reeve, and Teresa Reeve.

were joined by ten Jordanian workers during the excavations this season.

Since 1992, Andrews University has been conducting excavations in Central Jordan as part of the Madaba Plains Project, at the site of Tall Jalūl, near Mādabā, with Phase I excavations at the site, ending in 2012. More recently, excavations are being carried out at of the site of KHirbat Aṣ Ṣafrā. A surface survey was conducted in the summer of 2017, with physical excavations at the site, in 2018, 2019, and 2021, followed by a fourth season of excavations in 2022. For background information on Tall Jalūl, the Jalūl Islamic Village, and the history of the excavations at the site, see Gane *et al.* 2010; Gregor 2009; Gregor and Gregor 2009, 2010; Gregor *et al.* 2011, 2012, 2017; Herr *et al.* 1994, 1996, 1997; Younker *et al.* 1993, 1996, 1997, 2007; and 2009; Younker, Gane and Shqour 2007; Younker and Merling 2000; and Younker and Shqour 2008. For a report on the KHirbat Aṣ Ṣafrā Survey, in 2017, and a history of earlier research in the immediate region, see Gregor 2021. For a preliminary report on the first season of excavations at KHirbat Aṣ Ṣafrā, in 2018, see Gregor *et al.* 2021; on the second season of excavations in 2019, see Gregor, Ray and Moody, 2023: 233-239, and on the third season of excavations in 2021, *cf.* Gregor *et al.* 2023: 241-250.

Results of the 2022 Season at KHirbat Aṣ Ṣafrā

KHirbat Aṣ Ṣafrā is an approximately 2.6-acre site, located southwest of Mādabā, overlooking the Dead Sea (**Fig. 1**), with a casemate



1. Regional Map.

wall system around the perimeter. Excavations this season took place in three Fields (A, C, and E). Each excavation square was opened, using a Total Station on a grid of 6.0×6.0 m squares laid over a topographic map created by the Department of Antiquities surveyors during the survey season, in 2017 (**Fig. 2**).

Fortification System

Parts of the casemate wall system, which dates to the early Iron Age I, have been exposed in four of the excavation fields (A, B, C, and D) on the site. The casemate wall is divided into broad room compartments, which are integrated into rectangular-shaped houses, built up against it. The walls of these buildings are freestanding, built directly upon bedrock, which is uneven, with various-shaped crevices. A level surface for building the walls and laying the earliest floors was created by filling in these crevices with a densely packed, sterile, brick-like material. The site is entered via a gate structure at its northern end, also dating to the early Iron Age I (**Fig. 3**).²

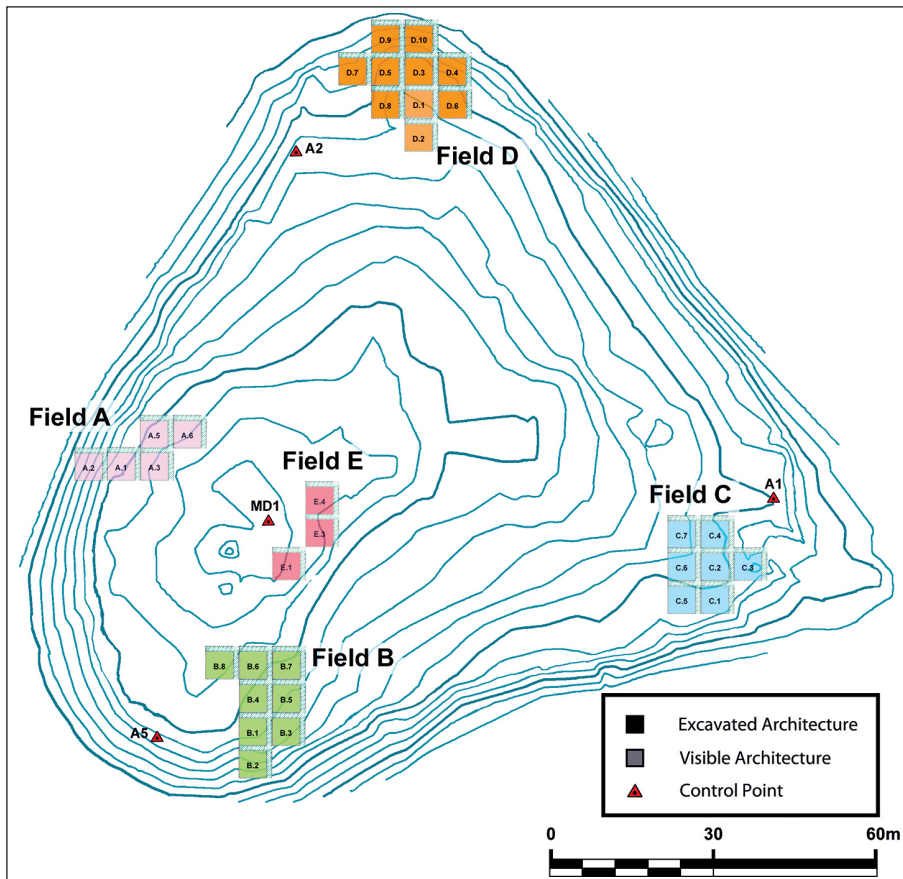
2. For a more in-depth description of the casemate wall system and the gate structure, see Gregor *et al.* 2021, Gregor, Ray, and Moody 2023: 233-239, and Gregor *et al.* 2023: 241-250,

Field A

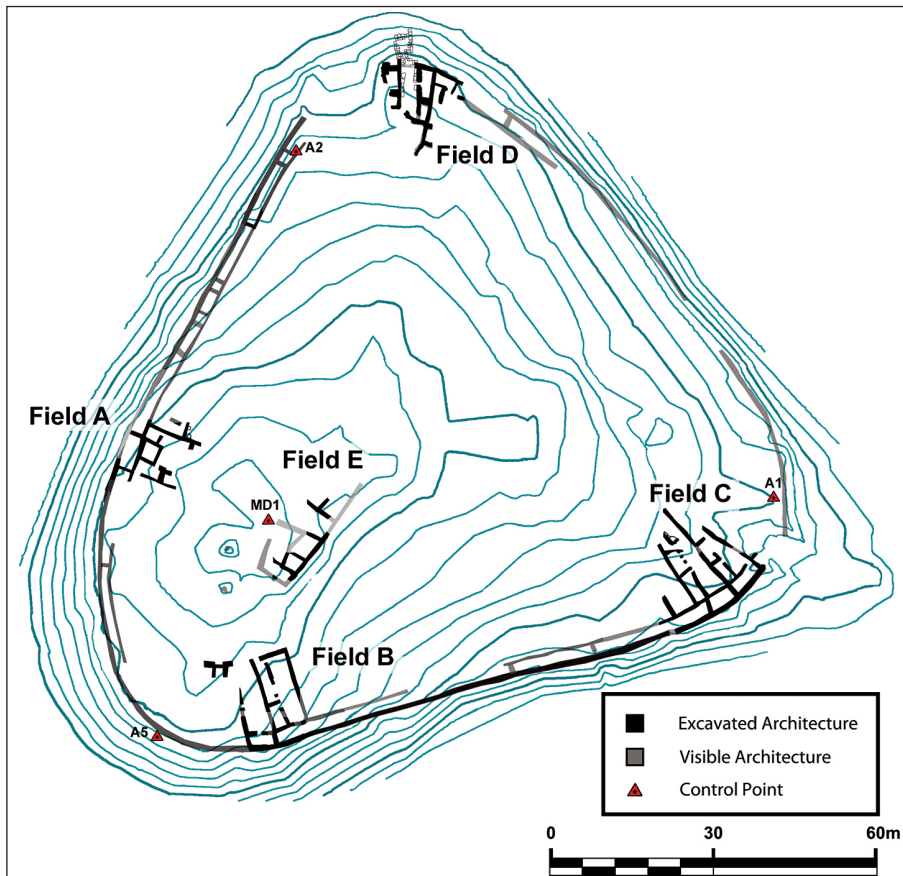
Field A lies on the western edge of the site (**Fig. 4**) and was supervised by Constance Gane. Excavation in this field was began in 2018 and focused on Squares A1 and A3. After a hiatus of two seasons, two new squares (A5, A6) were opened in 2022. Bedrock was reached in both squares. Based on the findings from 2018, which were confirmed by this season's results, the initial occupation of this part of the site began in Early Iron Age I and continued into Iron Age II. Followed by a long period of abandonment, it was then reoccupied in the Early Byzantine period.

The casemate fortification wall system uncovered in Square A1 in 2018, was built directly upon bedrock. Uneven portions of the bedrock were leveled using a densely packed, red-bricky material. The outer wall (A1:4) is two-rows thick, built with large field stones. The inner wall (A1:3), which was only partially exposed, is one row thick. A one row thick, east-west cross wall (A1:5) connected the outer and inner casemate walls, created two rooms, without a discernable doorway between them. Early Iron Age I ceramics were found directly upon the bedrock (A1:14, 15), upon which beaten-earth surfaces (A1:9, 11) were found in both rooms, with ceramics dating to early Iron Age I. Numerous animal bones, stone grinders and pestles were also found as well as large pockets of ash. Above this surface in both rooms is a mix of Iron Age I, Iron Age II, and Byzantine-period ceramics among what appears to be a mudbrick superstructure collapse, indicating a violent disruption, probably by an earthquake.

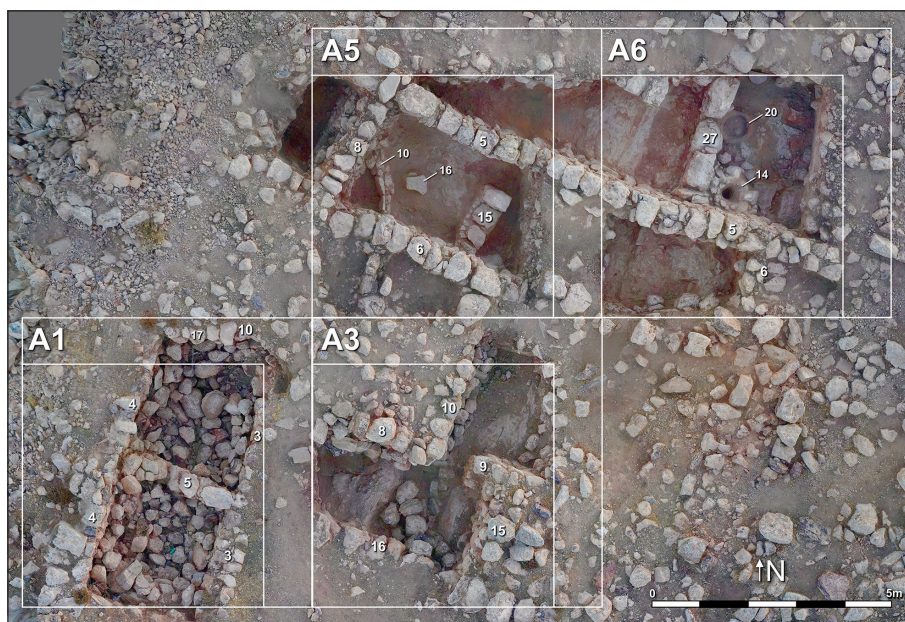
Square A3, provided a clearer occupational history. Approximately half of the square was excavated in 2018. At least three phases of occupation are discernable in the two, partially excavated rooms. A doorway provided access between the rooms. Once again, red-bricky material (A3:24) was used to even out the bedrock surface. In the southern room, Early Iron Age I ceramic remains were found in this material, below a plaster floor (A3:21). Early Iron Age I sherds were also found embedded in the plaster floor providing it a reliable date. Above this level, a thick (up to 0.50 m) ashy lens covered most of the two rooms, indicating



2. Topographic Map of KHirbat Aṣ Safrā with Excavation Fields.



3. Topographic Map of KHirbat Aṣ Safrā, with excavated and visible architecture.



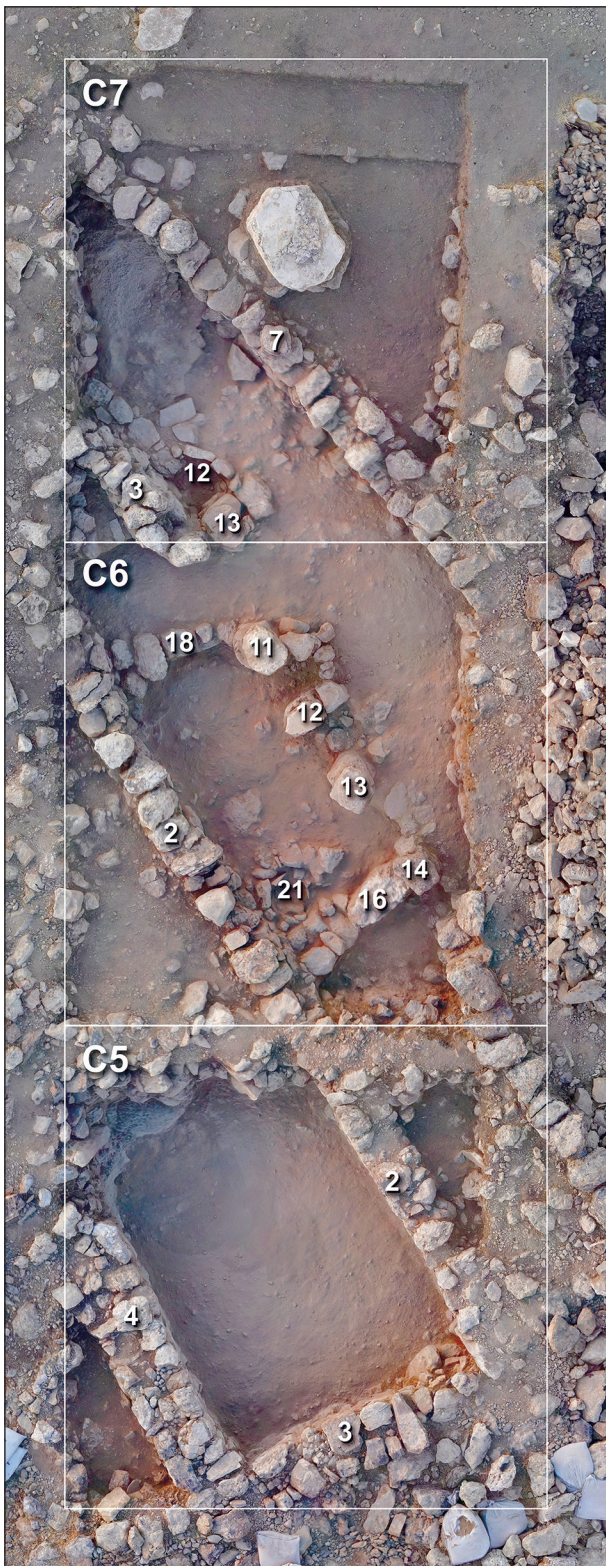
4. Field A.

a conflagration of the Iron Age I habitation, including the tops of its walls (A3:25, 27). Post-occupational debris suggests a period of abandonment. Above the debris was a beaten earth surface (A3:17) that dates to the Byzantine period. At this time, substantial Byzantine walls (A3:8, 9, 10) and probably Walls A3:15, and 16 were built; with at least one (A3:8) built upon an earlier Iron Age I wall (A3:25). A later beaten earth surface (A3:11) also dates to the Byzantine period.

During the 2022 excavation season, two new squares (A5, A6) were opened. A substantial single-row, 4-5 course wall (A5:5=A6:5), went through both squares, over 10.0 m in length. To the north of this wall there is a large, open (western) room, running through Square A5 and part of A6, its exact dimensions unknown at this point. Just above bedrock (A6:13) and the typical red-bricky material is a hard-packed earth surface (A5:27=A6:18). The date of this surface, based on the abundant ceramic finds, is Early Iron Age I. Numerous grinders, pounders and other stone household implements were found in this room. Above this surface, was post-occupational debris covered by a second Iron Age I hard-packed earth surface (A5:21). As elsewhere in the Field, this surface was disturbed by seismic activity, with mixed debris and tumble from the surrounding walls, including a mixture of Early and Late Iron Age I and Byzantine-period ceramics.

In the eastern half of Square A6 there is a north-south two-phased wall. The first course of massive field stones (A6:27), dating to Iron Age I, is topped by another course (A6:7), dating to the Byzantine period. East of this wall there are three surfaces, all dating to Iron Age I, with the earliest dating to Early Iron Age I. Two *tabuns* (A6:14 and A6:20) were found against the east face of Wall A6:27. These installations were associated with a smooth and level plaster floor (A6:23), only portions of which are preserved. The pottery found associated with the plastered floor dates to Early Iron Age I, the same as the plaster floor in Square 3. Above this floor is a shallow lens of debris and a heavy deposit of ash, topped by a second Iron Age I surface (A6:22). A third Iron Age I surface (A6:16) of hard-packed earth represents the final discernable occupation of this East Room.

An entirely different scenario is presented by the area occupied just south of Wall A5:5=A6:5. In Square A6, a hard-packed surface (A6:30) was found just above bedrock, above which was a thick post-occupational deposit that included ceramics from the Iron Age I and Byzantine periods. In Square A5, a large room is bound by walls on the north (A5:5), south (A5:6) and west (A5:8). Two surfaces were found in this room, both dating to the Byzantine period. The earliest surface is a hard-packed earth surface, upon which is a stone installation in the southwest corner (A5:10), next to what appears to be a



5. Field C: Squares excavated in 2022.

stone “table” (A5:16), and a *tall* central, stone pillar possibly connected with a single course wall (A5:15) that abuts the southern wall (A5:6) at the eastern end of the square. A relatively

thick post-occupational deposit covered this entire area. Later a second Byzantine-period hard-packed earth surface indicates another occupational level. Several worked stone beads were found, randomly distributed in the debris.

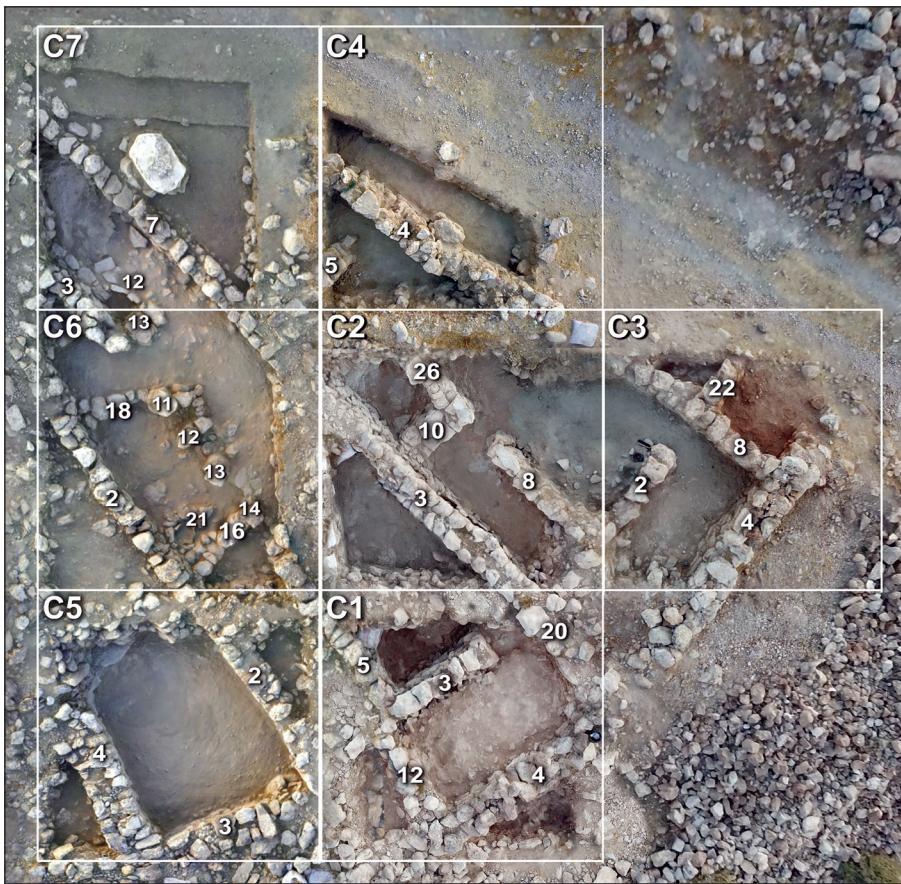
To understand the ephemeral western wall (A5:8), a 1.0×2.0m exploratory trench was excavated just west of it. The trench contained nothing but post-occupational debris, except at the very bottom, where an Early Iron Age I hard-packed earth surface was found, under which was only Early Iron Age I pottery. While the top of the western wall (A5:8), which is small and very poorly built, dates to the Byzantine period, it is built on top of an earlier Early Iron Age I wall (A5:32) that is much more substantial, and possibly the continuation of the inner casemate wall (A1:3) found in Square A1.

Field C

In Field C, on the eastern edge of the site (Figs. 5 and 6), three new squares (C5, C6, C7) were opened this season, with bedrock reached in Squares C5 and C7, while the earliest floor in Square C6 was left intact.

Supervised by Trisha Broy, excavation in Field C during the 2018 and 2021 seasons focused on portions of three buildings incorporated into the fortification system (Fig. 6). These buildings each have a rear room, formed by the casemate walls. The two-rowed outer casemate wall (C1:4=C3:4), consisting of five extant courses, is *ca.* 90cm wide, and built directly on bedrock. It was leveled by the original builders, with a red-bricky material with gravel inclusions, and is composed of unworked field stones varying in size from 40-60cm in width. The inner fortification wall (C1:3=C3:2=C5:3) is a single row wall, also built directly on prepared bedrock, and is *ca.* 55cm wide, composed of unworked field stones 40-60cm in width. Single row walls (C1:12, 20 and C3:8) divide the space between the casemate walls into rear rooms that extend into the associated building via doorways. All the walls unearthed in Field C so far are made of boulder and chink construction with unhewn field stones. These stones are primarily made of limestone with a small percentage of chert stones.

In the 2022 season, operations in Field C



6. Field C.

concentrated on exposing the interior rooms as well as further illuminating the building's relationship to adjacent structures. A new structure, designated Building 4, was opened in Square C5, southwest of Building 1. The two buildings, share an exterior wall (C5:2, C6:2) which runs south-east to north-west. It is a single-row wall with four extant courses. No doorways were found between the two buildings throughout its excavated length. Two other walls were excavated in Building 4. These are the inner casemate wall (C5:3), running perpendicular to Wall C5:2, and one of the building's interior walls (C5:4), parallel to Wall C5:2 from Wall C5:3, to the north-west, before disappearing into the west balk. These three walls characterized the only room excavated in Building 4 this season. The first occupation surface (C5:10=C5:11) was covered with a thick ash layer (C5:9), rich in food preparation implements. Among them was a large ovoid stone bowl, measuring 30cm in length.

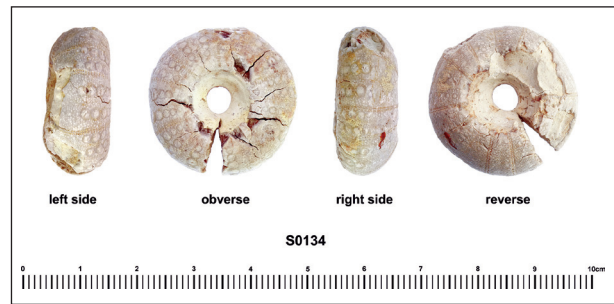
On the second occupation surface (C5:8), a large amount of wall tumble and fill, was found, indicative of destruction.

The architecture of Building 1 is more complex and was excavated in both Squares C6 and C7 this season. The building's south-western exterior wall is shared with Building 4 as described above. More of its north-eastern exterior wall (C1:20, C2:3, and C7:7) was exposed in Square C7 this season extending from Squares C1 and 2. The interior space of the building consists of two long rooms divided down their length by a pillared wall (C1:5, C6:11-14, and C7:3). This wall is segmented in the middle by a series of four pillars (C6:11-14). The northern (C6:11) and southernmost (C6:14) of these pillars are connected to low, single-row walls (C6:16, and 18) that further divide the south-western long room (Room B). During a second phase of Building 1, Wall C6:10) was built to connect the two northern pillars (C6:11-12), further enclosing this subdivided space. The south-western long room disappears into the western balk of C6 and C7. The north-eastern long room of Building 1 (Room C) has no exposed divisions and continues along the full length of the building. At its northern end, a small wall (C7:13) extends from the central

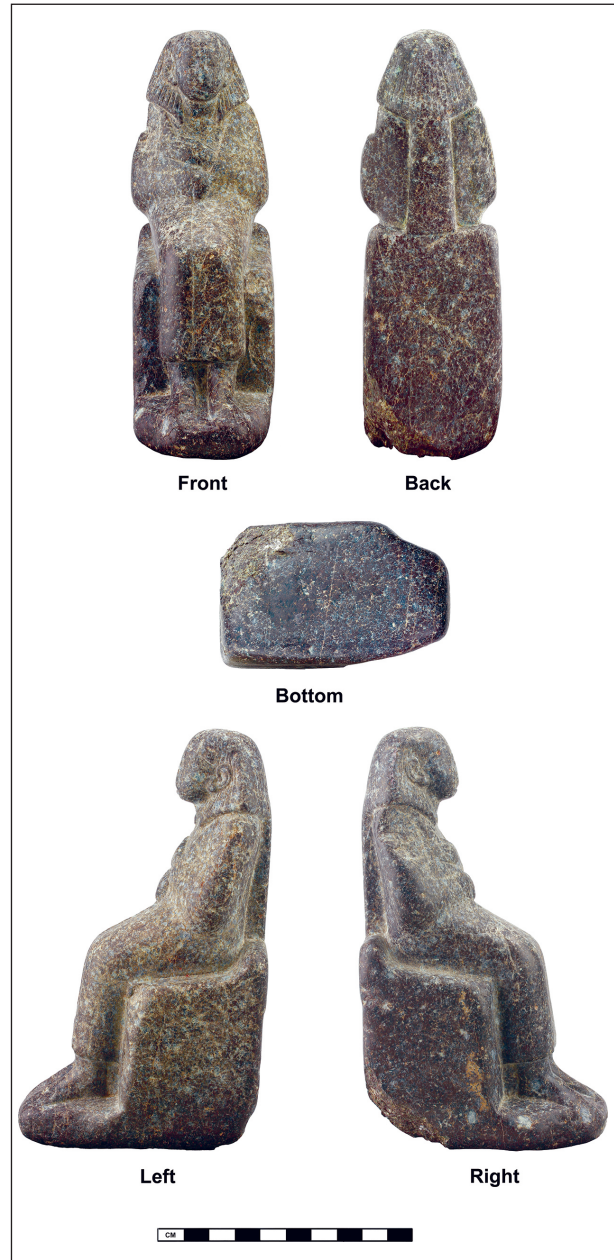
dividing wall toward the north-eastern exterior wall (C1:20, C2:3, and C7:7), forming a door.

Two use layers were discovered this season, one dating to the early Iron Age I and the later to the early Iron Age II. The first occupation layer consisted of bedrock with leveling fill in the low areas of the bedrock to create an even surface. In Building 1, this floor (C6:22=C7:10=C7:11) is consistently covered with an ash layer (C6:15=C6:17=C7:6), sealed under the second occupation floor (C6:8=C6:9=C7:5). The early Iron Age 1 floor in Building 1 incorporated two installations. In the south-western corner of Room B is a *tabun* (C6:21), with several large body sherds incorporated into its stone and brick construction. In Room C a semi-circular installation (C7:12) was uncovered in the space between and against Walls C7:3, and C7:13, that subdivide Rooms B and C. While the exact function of this feature is unknown, it is surrounded by a partial pavement (C7:11), contemporaneous with the original construction of the walls. The interior of the installation (C7:12) itself, is also plastered and may have been used to contain a small pool of water. The ash layer on the early Iron Age 1 floor in Building 1 is rich food preparation with implements, including querns, loaf-shaped grinders, pounders, pestles and mortars. Several additional objects of interest were found in this layer, in the space to the north of the door formed by C7:13 and the north-eastern exterior wall (C1:20, C2:3, C7:7). These included a fossilized sea urchin pendant (**Fig. 7**; S0134), a bronze needle, and an Egyptian figurine (**Fig. 8**, S0148), portraying a seated, cloaked male figure. The Egyptian figure underwent extensive conservation by Stefanie Elkins and Robert Bates to remove centuries of soil and calcrite but no writing was found on the object identifying the name of the figure.

Above the second occupation surface, wall tumble and fill continue to indicate destruction from an earthquake in early Iron Age II. Found in this debris (C6:5, C6:6, C6:7, C7:2, C7:4, C7:8) were more food preparation implements including a large, rectangular stone bowl (32cm in length), possibly interpreted as a trough or mortar, found in the northwestern corner of Square C7.



7. Fossilized Sea Urchin Pendant (Object S0134). Photo by Robert D. Bates.



8. Egyptian Seated Statue (Object S0148). Preliminary examination suggests that the statue dates to the late Middle Kingdom Egypt, possibly during the 13th Dynasty. Photo by Robert D. Bates.

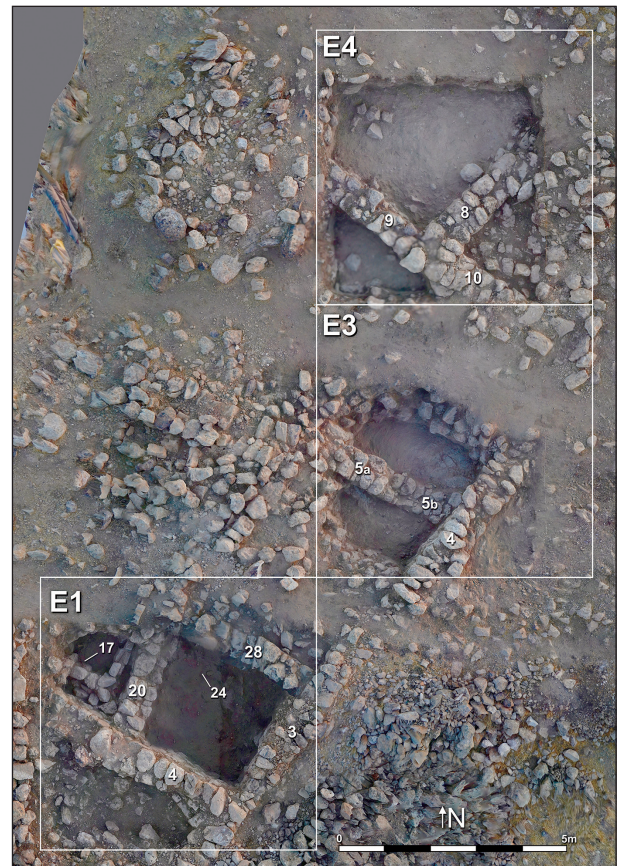
Field E

Excavations in Field E (**Fig. 9**) were supervised by Robert Bates, and in the 2022 season two new squares (E3 and E4) were opened, with work continuing in Square E1 from the previous season. Field E was opened in 2021 at the highest point of the site, approximately six meters south of its main control point (MD1). This area was chosen because usually the highest elevations of a site are reserved for cultic places and important buildings like administrative centers and elite living quarters. Squares E1 and E3 were also chosen specifically because they share a 35.0m wall that stretches north to south along the ridge.

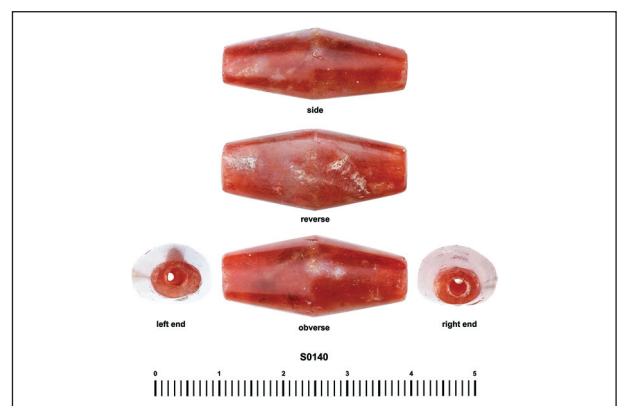
Square E1, consisting of a narrow building, *ca.* 1.8×4.6m, is divided into two rooms, and was opened briefly this season to remove the northern part of the east balk which obscured the relationship between the northern (E1:28) and eastern (E1:3) walls. A small triangular-shaped area was removed, systematically connecting each soil layer with those found in the 2021 season. The floor from the earliest occupation (dating to late Iron Age I) was exposed and a small utilitarian object was discovered. The eight-course eastern wall (E1:3) is *ca.* 1.4-1.5m high and is abutted by the northern wall (E1:28), which is *ca.* 1.3m high, with six courses. Both walls consist of two rows of partially faced hard limestone boulders between 0.30-0.45×0.20-0.30m in size, built on bedrock.

Excavations in Square E3 focused on its southern half, where the eastern wall (E1:3) of Square E1 continues northward, passing through the eastern side of the square. The east wall (E3:4) in Square E3 was built during the earliest phase of occupation and continued in use until a final wall collapse resulted in its abandonment. Wall E1:3=E3:4 runs north/south and was built on bedrock, using hard packed clay and small cobbles to fill in the unevenness of the surface. It is oriented at 35 degrees northeast and made of two rows of partially faced hard limestone boulders, ranging between 0.30-0.45×0.20-0.30m in size. A surface (E3:13=14), consisting of hardpacked soil, with flat lying pottery, sealed against Walls E3:4 and 5b. Two objects were found on the floor including a large (2.92 cm) red carnelian barrel bead

(S0140; **Fig. 10**), and a basalt bowl or mortar (S0123; **Fig. 11**). During this early phase an east/west wall (E3:5b) abutted Wall E3:4, dividing the area into two living spaces (Rooms A and B), north and south of the wall respectively. Only a single foundation course of this wall was found. It was built on the bedrock (E03:18) with hard packed clay. The eastern portion of the wall (E3:5b) was removed during a later phase and sealed with a new floor (E3:11). In this later phase, the remaining portion of the



9. Field E.



10. Large Carnelian Barrel Bead (Object S0140). Photo by Robert D. Bates.

wall (E3:5a) was extended westward, *ca.* 10.0 m, into the currently unexcavated Square E2. It consists of two rows of partially faced hard limestone boulders, ranging from 0.20-0.30m in size. Unlike Wall E3:4, Wall E3:5a was not founded on bedrock, but rests on 0.25m of soil.

Square E4 is located north of Square E3 but is not connected to the main North/South wall (E1:3=E3:4) that passes through Squares E1 and E3. This square consists of three walls, dividing it into parts of three rooms. The main wall (E4:8) is 3.4m long and is oriented 45 degrees northeast. The secondary walls (E4:9 and E4:10) abut it and are oriented 49 degrees northwest and 125 degrees southeast, respectively. All three walls consist of two rows of 0.30-0.40m of unhewn partially faced hard limestone and chert boulders. The north faces of Walls E4:8 and 9 form part of Room A, on the north, which is the largest of the three, and consists of five hard packed floors (E4:11, 13, 14, 15 and 16), with flat lying pottery, one on top of the other, all dating to the Early Iron Age I. Room B, on the east, is outlined in part by Walls E4:8 and 10, and was filled with wall stones that had collapsed into the area. Room C, southwest of Walls E4:8 and 10, consists of a

single hardpacked floor (E4:20), sealed against the walls.

Preliminary Conclusions

The results from the first four seasons of excavation indicate that the first settlement at KHirbat Aṣ Safrā was established during early Iron Age I, possibly as early as the late 13th century BC. This settlement was at least partially destroyed by fire later in Iron Age I, reflected by thick ash layers throughout much of the site, as revealed in Fields A, C and D. Following this destruction, the site was reoccupied until sometime in the early in Iron Age II, when it was destroyed a second time, most likely by an earthquake. Some post-destruction squatter occupation following the earthquake is possible based on a few late Iron Age II sherds. There was then a hiatus at the site until the Byzantine period, at which time a significant building was built in Field A, as well as the reuse of nearby structures. Some pitting activities in Field B, and surface sherds found throughout each of the excavation fields also indicate occupation at that time.

The preliminary phasing of KHirbat Aṣ Safrā is as follows:

Phase	Period	Excavation Fields and Features
Occupational Phase 1	Byzantine Period	A structures, B pits, B, C, D, E sherds
Occupational Phase 2	Early Iron Age II	B, C, reused buildings, A, D sherds
Occupational Phase 3	Iron Age I	A, B, C, D, E, fortifications, and buildings



11. Small Basalt Bowl (Object S0123). Photo by Robert D. Bates.

As in the first three seasons, the excavations in 2022 yielded mostly small finds connected with agricultural and domestic functions. Of the 157 objects discovered this season, 86 were related to agricultural and domestic activities. In addition, 14 textile objects were also uncovered, with eight items of jewelry; mostly beads, seven recreational (gaming piece) artifacts, with only four (sling stones) related to warfare. Based on the ceramics and objects, found so far, it appears as though the site of KHirbat As Safrā generally represents a domestic settlement, with an emphasis on agriculture and some cottage industries. Notwithstanding, at least six of the artifacts, are Egyptian or Egyptian inspired, including the seal³, and scepter found in 2021, and more prominently, the seated Egyptian statue⁴ found this season, which suggests that KHirbat As Safrā played a more significant role in the region.

Flotation

While material culture is important for understanding the lives of ancient people, the focused activities performed in specific places within domestic locations **can provide another** window into aspects of their behavior. Soil samples from carefully selected **stratigraphic contexts** were again collected this season, in all three of the excavation fields (A, C, and E). These samples were run through floatation tanks, under controlled conditions, providing archaeobotanical evidence for which laboratory analysis and species identification should yield added insight into the micro-level activities of the daily life of the ancient people at the site. Unfortunately, our biotechnological analyst Annette Hansen was unable to be physically present on-site but was available for logistical help via email. Financial support for this part of the project was again provided by a Faculty Research Grant from Andrews University.

Logistics

Work on the digital form of the *locus* sheets of the Madaba Plains Project Field Manual has

continued to evolve, with new functionality for recording of botanical samples added by Robert Bates this season. The system uses FileMaker Pro software, and runs on the FileMaker Go App, on iPads. The data are backed up to a laptop computer at the end of each day. Progress shots and end-of-the-season photography were taken with a digital camera mounted on a Wonder Pole™ (a telescoping device with a camera mount on top), using a blue tooth connected mobile phone to activate the shutter, as well as 3D LiDAR digital photography taken on iPads. The numerous images are combined to create final 3D images of each square, using Metashape Photoscan Pro software by Robert Bates.

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3. The seal (Object S0085) is being studied separately by Trisha Broy, who will present the results in a separate venue.

4. Interestingly, this artifact is typical of Middle Kingdom Egypt statues, hundreds of years earlier than the early Iron Age I *in situ* context in which the artifact was found. This fact suggests the possibility that it was an heirloom brought to the site by a family connected with Egypt in some capacity.

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PRELIMINARY REPORT ON THE 2023 SEASON OF EXCAVATIONS AT KHIRBAT AṢ ṢAFRĀ

Paul Gregor, Paul Ray, Robert Bates, Constance Gane, Trisha Broy and Talmadge Gerald

Introduction¹

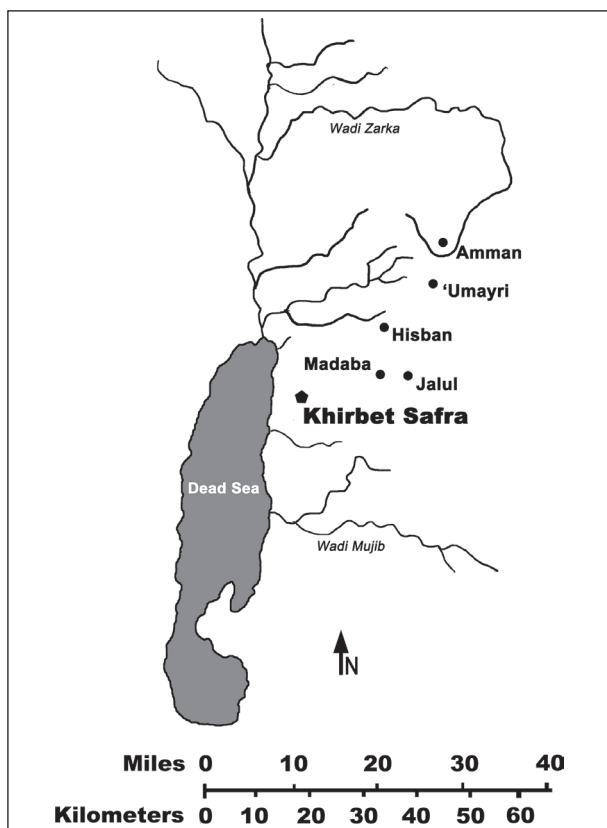
Andrews University conducted its fifth season of archaeological excavations at Khirbat Aṣ Ṣafrā from June 7-26, 2023. The excavations were directed by Paul Gregor of the Institute of Archaeology at Andrews University, with co-

1. We wish to thank HE Fadi al-Balawi, Director General, and his staff at the Department of Antiquities of Jordan for their support of the project during this season. Also, we would like to express our appreciation to the Director of the Madaba Antiquities Directorate, of the Department of Antiquities of Jordan. In addition, we would like to thank Pearce Paul Creasman and Helen Malko of the America Center of Research (ACOR) for their usual assistance. Furthermore, we appreciate the help of Dr. Shadi Ali Ibrahim Al-Hraut and Yasser Hashem Salem of the Department of Antiquities of Jordan, who served as our department representatives in 2023 season. Finally, we wish to thank Matthew Vincent from ACOR with GIS assistance and other aspects of his technical expertise.

Staff for the 2023 season included Paul Z. Gregor as director. Paul Ray served as object registrar, with the help of Stefanie Elkins-Bates, Elizabeth Emswiler, Jeffrey Hudon, Daliyah Hudon, and David Glazer. Trisha Broy served as pottery registrar. Robert Bates served as technical advisor, dealing with the electronic database and iPad issues. Archaeobotanical specialists Annette Hansen and Frits Heinrich from the FOST Lab, Vrije Universiteit Brussels, did on-site botanical analysis with the team this season. The Square supervisors for Field A were Ramon Wiens, Carina Prestes and Abalardo Rivas; for Field B they were Elizabeth Emswiler, and Eva Glazer; for Field C they were Hala Ajilat, Daliyah Hudon, and David Glazer; for Field D they were Ryan Wilson and Nathaniel Brumbaugh, Jeffrey Hudon, and Scottie Baker, and for Field E they were Sergey Panfilov, and Christie Chadwick. Volunteers included Georg Filippou, Anna Filippou, Andreas Filippou, Anthony Lavea, Toa Fio, Hyoukgu Kim, SeKwang Seo, Yo Han Song, Johanna De Haven, Lori Gregg, Miguel Rodriguez, Adrian Santago, Diala Michael, Robert MacKay, Arnie Baker, Lora Baker, Daniel Brown, Natalia Brown, Daniel Gil, Sergio Gil, Adam Hamstra, and Jonathan Ramos.

director Paul Ray, Robert Bates, Constance Gane Trisha Broy and Talmadge Gerald functioning as Field Supervisors. About forty-three faculty, specialists, students, and volunteers were joined by ten Jordanian workers during the excavations this season.

Since 1992, Andrews University has been conducting excavations in Central Jordan as part of the Madaba Plains Project, at the site of Tall Jalūl, near Mādabā, with Phase I excavations at the site, ending in 2012. More recently, excavations are being carried out at the site of Khirbat Aṣ Ṣafrā. A surface survey was conducted in the summer of 2017, with physical excavations at the site in 2018, 2019, 2021 and 2022, followed by a fifth season of excavations in 2023. For background information on Tall Jalūl, the Jalūl Islamic Village, and the history of the excavations at the site, see Gane *et al.* 2010; Gregor 2009; Gregor and Gregor 2009, 2010; Gregor *et al.* 2011, 2012, 2017; Herr *et al.* 1994, 1996, 1997; Younker *et al.* 1993, 1996, 1997, 2007; and 2009; Younker, Gane and Shqour 2007; Younker and Merling 2000; and Younker and Shqour 2008. For a report on the Khirbat Aṣ Ṣafrā Survey, in 2017, and a history of earlier research in the immediate region, see Gregor 2021. For a preliminary report on the first season of excavations at Khirbat Aṣ Ṣafrā, in 2018, see Gregor *et al.* 2021; on the second season of excavations in 2019, see Gregor, Ray and Moody 2022, on the third season of excavations in 2021, *cf.* Gregor *et al.* 2022, and on the fourth season of excavations in 2022, *cf.* Gregor *et al.* 2025: 57-67.



1. Regional Map.

Results of the 2023 Season at Khirbat As Safrā

Khirbat As Safrā is an approximately 2.6-acre site, located southwest of Mādabā, overlooking the Dead Sea (Fig. 1). The site was occupied beginning in early Iron Age I and was continuously inhabited into early Iron Age II, after which it was abandoned until the Byzantine period, when it was lightly occupied.

Excavations, this season, took place in all five fields (A, B, C, D and E) on the site. Each excavation square was opened, using a GPS on a grid of 6.0×6.0 m squares laid over a topographic map created by the Department of Antiquities surveyors during the survey season, in 2017 (Fig. 2).

Fortification System

Khirbat As Safrā, as the name suggests, has exposed ruins with a casemate-type wall system, surrounding the perimeter that has been found in four of the excavation fields (A, B, C, and D) on the site. The casemate wall system is divided into broad room compartments, integrated into rectangular-shaped buildings that extend into the settlement. The walls,

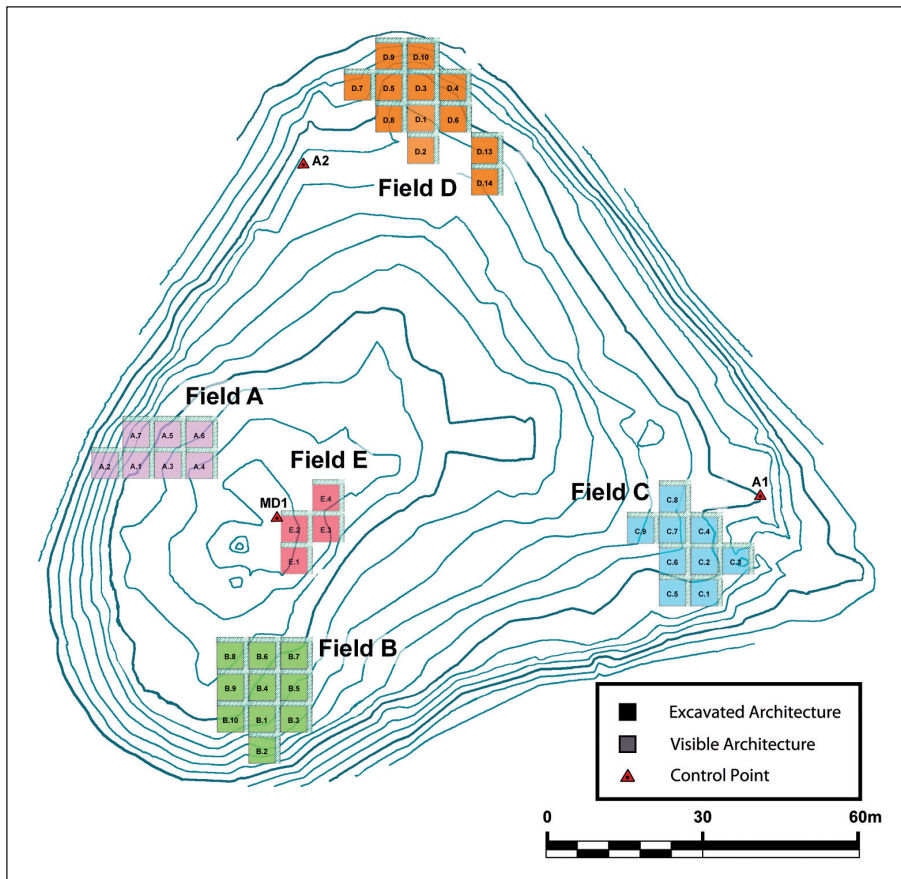
which were built directly upon uneven bedrock, with various-shaped crevices, are freestanding. A level surface for building the walls and laying the earliest floors was created by filling in these crevices with a densely packed, sterile, red brick-like material. The site itself is entered via a gate structure, also dating to the early Iron Age I, at its northern end (Fig. 3).

Field A

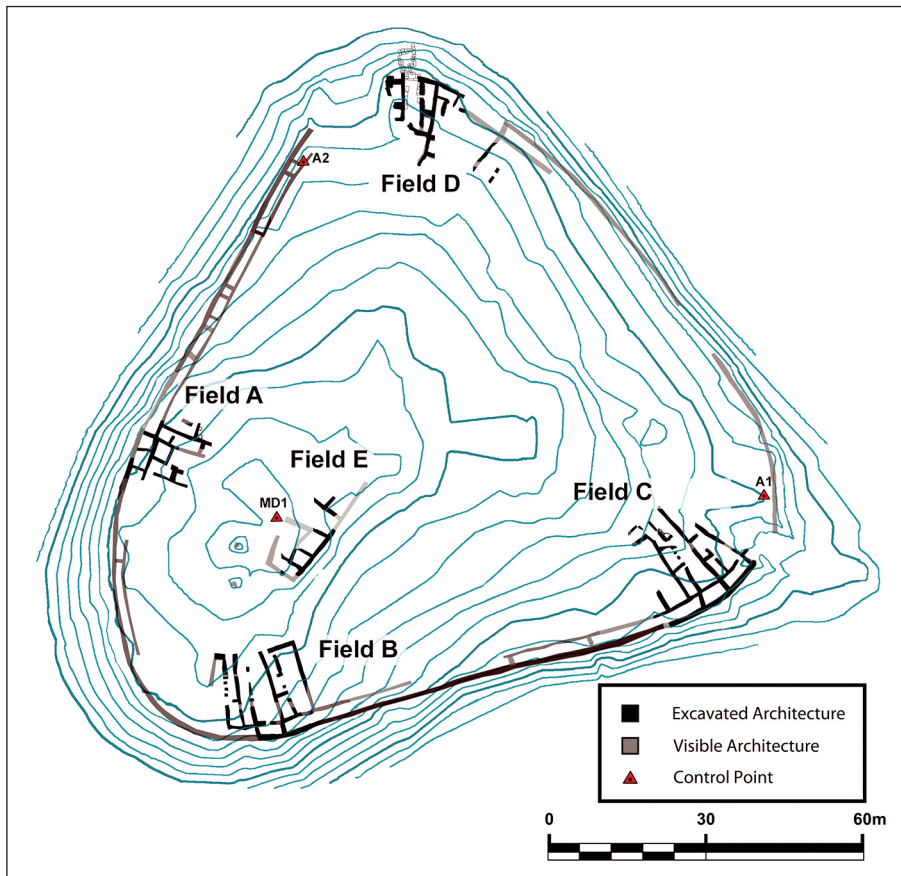
Field A lies on the western edge of the site, and as in the 2018 and 2022 seasons, it was supervised by Constance Gane. Excavations this season focused on parts of two squares (A3 and A5), which were re-opened, and a new square (A7), opened in another segment of the casemate wall. Bedrock was reached in Squares A3 and A5.

The casemate fortification wall system, uncovered in Square A1 in 2018, was built directly upon bedrock (Fig. 4). Uneven portions of the bedrock were leveled, using a densely packed, red-bricky material. The outer wall (A1:4) was two-rows thick and built with large field stones, chinked with smaller stones. The inner casemate wall (A1:3) was only partially exposed, as part of it remains in the eastern balk of the square. The inner wall was only one row thick. An east-west cross wall (A1:5), also one row thick, connected the outer and inner casemate walls, creating two rooms. No passageways were discerned that would have allowed access from the long rooms into the casemates. The room to the north of the cross wall (A1:5) was bounded by a northern wall (A1:17). The casemate fortification wall was further defined this season, with the opening of Square A7. The outer casemate wall A7:1 is a northward extension of the outer casemate wall of A1:4. The inner casemate wall A7:2=A3:41=A5:36 is a northward extension of the inner casemate wall of A1:3. East-west cross walls, A7:3 and A7:4, north and south respectively, created a room that has so far yielded two hard-packed plaster surfaces (A7:6 and A7:7).

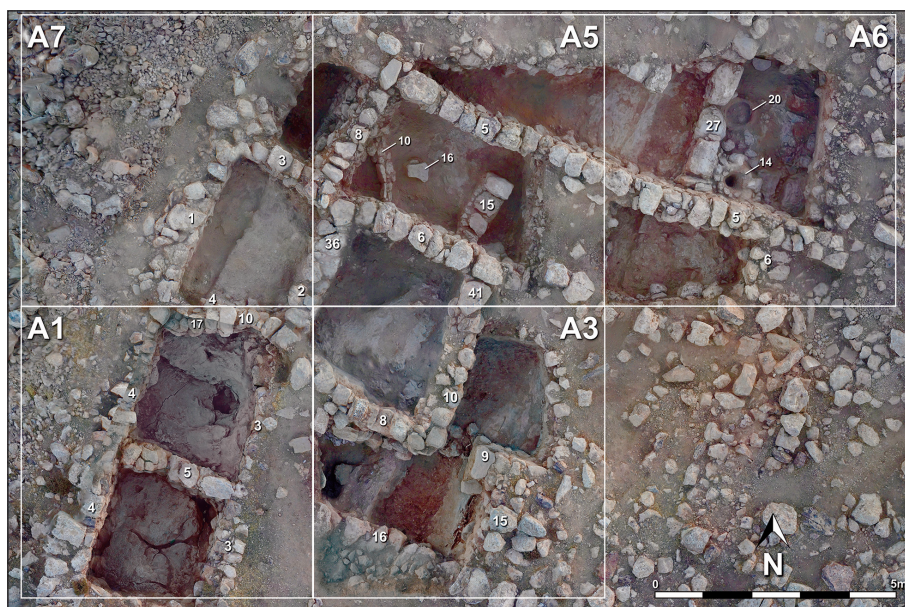
Based on the 2018 data, there appears to have been at least two occupation levels within the two rooms of the casemate walls in Square A1. Early Iron Age I ceramic remains were found directly upon the bedrock (A1:14) in



2. Topographic Map of Khirbat Aṣ Ṣafrā with Excavation Fields.



3. Topographic Map of Khirbat Aṣ Ṣafrā, with excavated and visible architecture.



4. Field A.

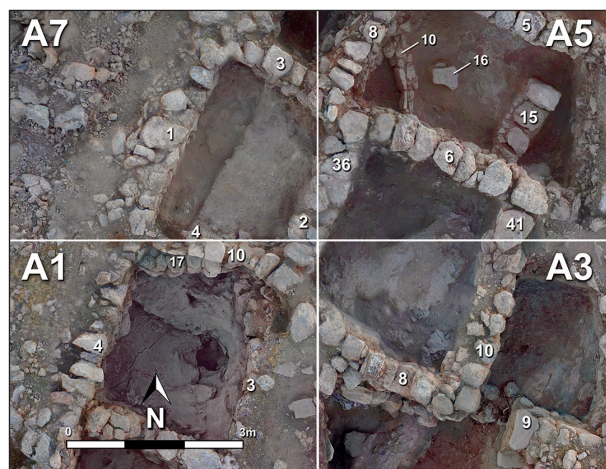
the northern room. Directly above this pottery, was the hard, red-bricky material, as well as ash, *nari*, and rocks. An Iron Age I beaten earth surface (A1:11) was found above this debris. A parallel beaten earth surface (A1:9) was found in the southern room above the bedrock and bricky fill (A1:15). Ceramic remains indicate an Iron Age I occupation for this surface. Numerous animal bones, stone grinders and pestles were also found as well as large pockets of ash. Above this surface a mixture of Iron Age I, Iron Age II and Byzantine ceramics indicate possible subsequent occupations. However, due to an earthquake, the later occupation levels are impossible to detect. What may have been hard packed earth surfaces are discernable, but they undulate and are mixed with debris and tumble from the surrounding walls. The casemate walls lean to the west. What appears to have been the mudbrick superstructure collapsed into the rooms from the west, indicating a violent disruption to life here.

As mentioned above, the excavation of Field A begun in 2018, focused on Square A1 and parts of Square A3. It was then left untouched until the 2022 season, at which time part of Square A5 and all of Square A6 were excavated, with the results confirming that the initial occupation of this part of the site began in early Iron Age I and continued into Iron Age II, being followed by a long period of abandonment, and then reoccupied in the Early Byzantine period.

In 2023 the previously unexcavated parts of

Squares A3 and A5 were completed (Fig. 5), providing further evidence of a Byzantine period presence, with a remnant of the early Iron Age I occupation. The earliest phase (IV) of occupation dates to early Iron Age I and is located within an area bounded by the inner casemate wall (A3:41=A5:36=A7:2) of the broad room, to the west, and the northern (A5:6) and southern (A3:27) walls that formed a long room that extended into the settlement. Here, early Iron Age I pottery was found on top of the sloping bedrock surface (A3:40=A5:42).

In the next phase (III), when this part of the site was reoccupied during the Byzantine period, after a long hiatus, the new occupants removed much of the earlier Iron Age structures and likewise founded their own on bedrock (A3:40=A5:42). Here, little was found besides



5. Field A squares excavated in 2023.

some Byzantine-period pottery on bedrock and inside the pits (A3:34 and 35) and cavities within it. Whatever else might have originally been there, this occupation ended with a major conflagration, which left a thick ashy layer (A3:37=39=44=A5:38=39) that covered the entire area. This material correlates with the thick (up to 50 cm) ash layer found above the plaster floor (A3:21) in the portion of Square 3, excavated in 2018. Numerous ceramic vessel fragments of cooking pots, jars and bowls were found in the earth and thick ash remains. In addition, a wide variety of stone food-processing implements were found, including loaf-shaped grinders, pounders, pestles, a fragment of a kern and whetstones.

During the subsequent occupational phase (II), a *tabun* (A3:38) was built into and above the ash layer, on a foundation created with a few stones and large pieces of pottery. Its opening at the top measured 70cm. Several large fragments of cooking pots were found in the debris next to the *tabun*.

The final occupational phase (I) presents an unusual use of space. Presumably to make the area as flat as possible, a plaster layer (A3:30=33=36=43=A5:35=37) of various thicknesses was laid down, overlaying the *tabun*, the ash layer, and the bedrock, with its pits containing earlier material cultural remains. The highest level of the plaster was against the southeastern corner of the southern wall (A3:8=27) of the room, and sloped to the north, but did not reach the northern wall (A5:6). At this time, a new room was created by the addition of a Wall A3:10 on the east. A second row of stones (Wall A3:8) was also added on top of and on the north side of the Iron Age I southern wall (A3:27).

Above the layers of plaster (A3:30=33=36=43=A5:35=37), were post-occupational debris consisting of massive boulders and rock tumble, plausibly the result of additional tectonic activity from one of several earthquakes that occurred during the late Byzantine and the early Islamic period.²

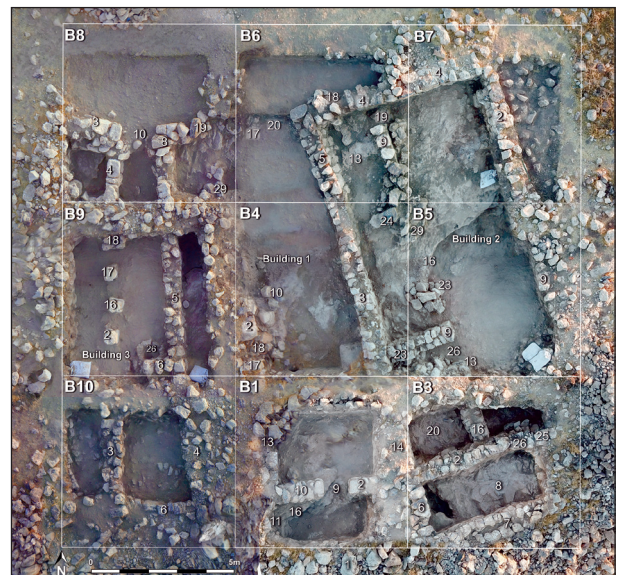
2. Perhaps the earthquake that destroyed the church of St. John the Baptist and the Monastery of St. Euthymius at the Baptism Site along the east side of the Jordan River, just north of the Dead Sea in 659/60 AD or the great earthquake of 748 AD which affected most of the Near East from Egypt to Mesopotamia, cf. Russell 1985: 39, Table 1 and 46-49.

The casemate room in Square A7 was only partially excavated. Nevertheless, the initial results yielded evidence of two possible plaster surfaces (A7:6 and A7:7) that may correspond to the plaster layers of the final occupational phase in Squares A3 and A5, dating to the Byzantine period. However, further excavation is necessary to confirm such a relationship.

Field B

This season, two new squares (B 9 and 10) were opened and partly excavated on the southwestern edge of the site, in Field B, supervised by Paul Ray. Another square (B8), partly excavated in 2021, was completed this season. In addition, the east balk of Square B8 was removed to help clarify the relationship between Buildings 1 and 3 (see below).

Excavation in Field B was begun in 2018. As in other parts of the site, crevices in the bedrock were filled with a hard, red-bricky, material in preparation for the initial occupation of this part of the site. During the first three seasons (2018, 2019, and 2021) two rhomboid-shaped structures (Buildings 1 and 2, **Fig. 6**), narrowing in width from south to north, and laid out over three bedrock terraces, have been almost completely excavated, both being incorporated into the casemate wall system which functions as the broad rooms of the structures. The remaining parts of these buildings consist of two long rooms, one, on the eastern side (2.70-3.60m wide, inside space), functioning as a



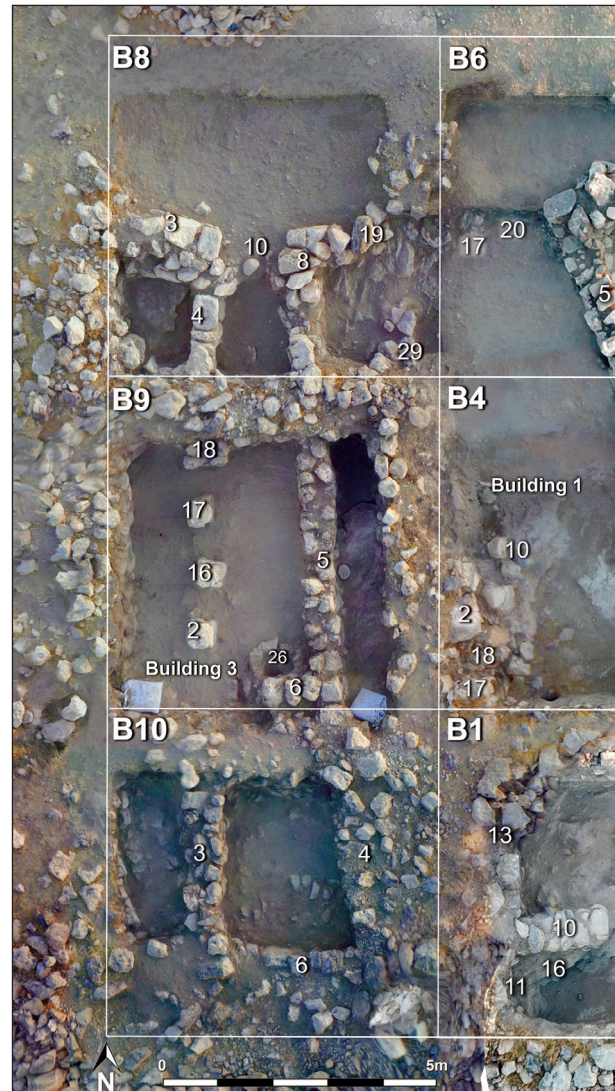
6. Field B.

“courtyard,” into which, are entrances from the broad room casemates. The second long room (1.70-2.80m wide, inside space), on the western side of the buildings, was further subdivided, as needed, into smaller spaces. The entrances to the buildings are on the north side, opposite the casemate broad rooms. Both buildings thus form traditional three-room house structures. Their lengths vary between 15.70 and 16.20m, with total widths as wide as 7.10m and as narrow as *ca.* 5.90m. The walls of the buildings vary from 0.60-0.80m wide, preserved in some places as high as six or more courses. Of the two structures, Building 2, on the eastern side of the field, is the best preserved. These buildings date to Iron Age I and existed until sometime in early Iron Age II, when they were destroyed, as was the rest of the site, by an earthquake.

Part of a third building, to the west of Building 1 (**Fig. 7**), was excavated in 2021, and continued this season. Previously, it was thought (see the 2021 preliminary report) that Building 1 was a two-room house (one long room and one broad room), with a postern entrance on the west, possibly leading either into an alleyway between the buildings or else directly into the building to the west. Hence, it was thought that the “western wall” of Building 1 was not shared with the new building to the west. We no longer believe that to be the case (see below). Instead, Wall B1:11=13=B4:2=17=B8:29 is now understood to be the wall line of the subdivided sections of the narrower long room of Building 1.

The outline of Building 3, as excavated so far, includes the east wall (B8:8=B9:5=B10:4), constructed with a single row of stones, 0.70-0.80m wide, that is shared with Building 1. It is 16.20m in length and preserved for up to five courses in places. The unexcavated western wall of this building can be seen just above the current surface, outside of Square B8, and awaits future excavation. This wall runs on a slightly oblique angle, due it would seem, to the topography of the site, which begins to turn in a semi-circle to the northwest at this point (see **Fig. 3**). Hence, it deviates from the pattern of Buildings 1 and 2. Along these lines, at least on the north end, the building is somewhat narrower than the other buildings excavated so far. Like the other structures, Building 3 is subdivided, but on the

east, the opposite direction of that of Buildings 1 and 2, into a 1.70m wide long room, further subdivided into three spaces, with two rooms, one on either end. The one on the north consists of Walls B8:4=B9:18, B8:10; the entrance to



7. Field B squares excavated in 2023.



8. Field B Building 3: Pillared section of long room.

the building, and Wall B8:8, the second one consisting of Walls B9:6; B10:3, 4 and 6, on the south. In between, are three stacked pillars (B9:2, 16, and 17; **Fig. 8**). The remains of these pillars consist of two-three courses, reaching heights of 0.60-0.90m. A stone-lined installation (B9:26), possibly a fire pit, was found at the southern end of the pillared section of this long room, against Wall B9:6. The width of the larger, long-room courtyard is 2.70m on the north end but is not yet known on the southern end, as it extends to the southwest into areas still awaiting excavation. At the southern end of Square 10 is the inner casemate wall (B10:6), with its western end likewise awaiting future excavation. The northern wall (B8:3) of the building is 2.00m wide, with a 1.20m entrance (B8:10), which as in Building 2, enters the smaller subdivided long room of the building.

As in the other buildings, there is a beaten-earth surface (B8:13, 20), just above bedrock (B8:15, 24), with red brickly material (B8:14, 23), filling in the bedrock cavities. No surfaces have so-far been discovered dating to the late Iron Age I. However, since this building has only been partly excavated, the lack of evidence is not necessarily definitive. This building, like the two others, dates to early Iron Age I, with some later occupation as evidenced by Iron Age II pottery, including here, part of an early Iron Age II krater, found in the southern section of

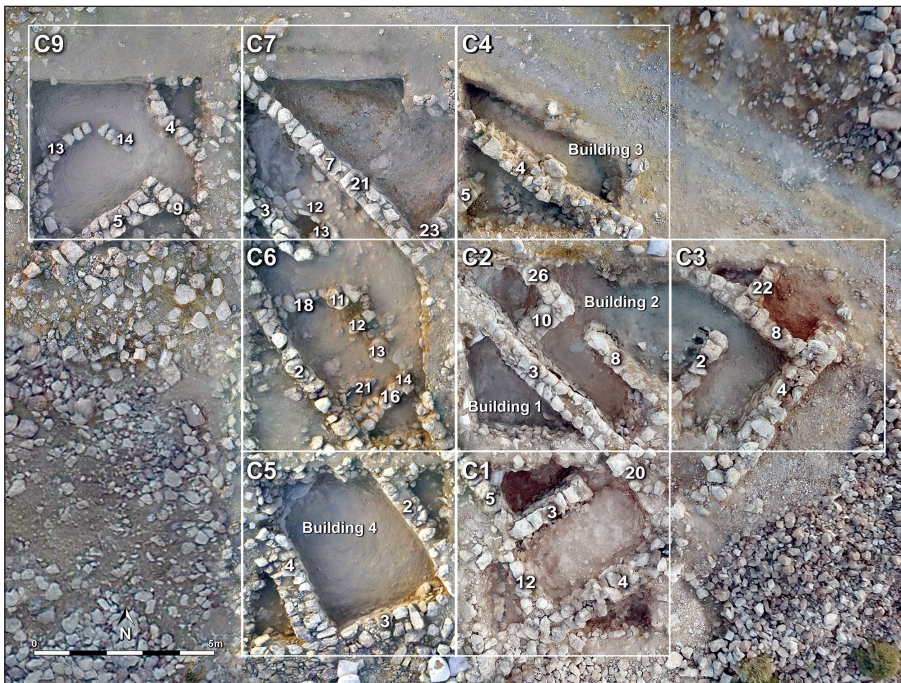
the subdivided long room. The building was ultimately destroyed in the early Iron Age II earthquake, with considerable rock tumble (B8:6, 7, 21; B9:3, 4; and B10:2, 5) from the walls, in evidence.

As noted above, the structures in Field B seem to have been abandoned in early Iron Age II, following the earthquake. Squatter activities may have occurred, as suggested by some occasional late Iron Age II ceramics. Later, during the Byzantine period, there seems to have been a light, perhaps squatter occupation here, as four isolated vessels were found in pits (B3:12, 13) in Square B3. Post-abandonment earth matrix material has accumulated ever since.

Field C

Field C is located on the northeastern corner of the site and is supervised by Trisha Broy. Here, one new square (C9) was opened this season. In addition, Square C7, opened in 2022, was also worked. Bedrock was reached in Square C7, with the early floor, as found elsewhere in the field, exposed and left intact. In Square C9, excavation was completed to the depth of the later floor, leaving earlier material to be removed in a future season.

During the previous seasons, the excavation in Field C has focused on portions of four buildings incorporated into the fortification system (**Fig. 9**). These buildings each have a



9. Field C.

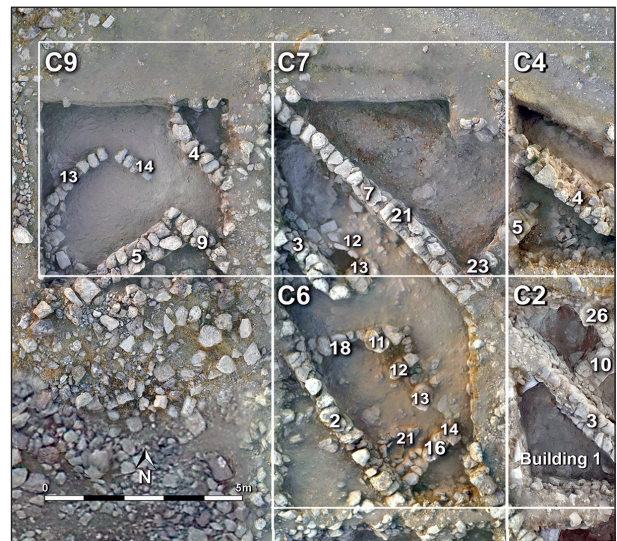
rear room, formed by the casemate fortification walls. The outer wall of the casemate was built directly on bedrock, which had been leveled by the original builders, with a red-bricky material with gravel inclusions. This wall (C1:4=C3:4) is a two-row wall with five surviving courses. It is approximately 90cm wide and is composed of unworked field stones, varying in size from 40- 60cm in width. The inner casemate wall (C1:3=C3:2=22=C5:3) is a single-row wall, also built directly on prepared bedrock. It is approximately 55cm wide and is composed of unworked field stones varying in size from 40- 60cm in width. Single-row walls (C1:12 and C3:8) and double-row wall (C1:20) divide the space between the inner and outer fortification walls into rear broad rooms of buildings that extend into the settlement. These rooms are connected to the rest of the associated buildings by a doorway. All of the walls thus far unearthed in Field C are made of boulder and chink construction with unhewn field stones. These stones are primarily limestone with a small percentage of chert stones.

In the 2023 season, operations in Field C concentrated on exposing the main entrances of Buildings 1 and 2, first opened during the 2018 season, as well as further illuminating the buildings' direct relationship to the adjacent attached structures. These buildings, designated as Building 3 and Building 4, are located on the north-east and south-west sides, respectively, of Buildings 2 and 1.

The shared exterior wall of Buildings 1 and 4 (C5:2=C6:2=C9:9) runs from the south-east to the north-west (**Fig. 10**), with Building 1 on the north-east side of this wall and Building 4 on its south-west side. It is a single-row wall with four surviving courses. No doorways, openings, or connections between Buildings 1 and 4 were found in the excavated length of this wall. Perpendicular to this wall, is a double-row wall (C9:5) that presumably serves as the front wall for Building 4. While this season's work did not fully elucidate this wall's relationship to the rest of Building 4, but it did bring greater clarity to the nature of the primary entrance to Building 1. This wall (C9:5) forms a right angle to Walls C9:9=C6:2=C5:2) on the southwest side of the entryway, with Wall C9:4=C7:3=C6:13=C1:5) forming the north-

east side of the entry. However, this entryway has yet to be cleared and fully excavated, with the removal of the east balk of Square C9. A small enclosure (C9:13, 14), perhaps an animal pen, was unearthed outside (northwest) of wall C9:5. While it has not yet been fully excavated, it currently appears to have openings on both the south-east and north-west sides, perhaps indicating that it was used by the inhabitants of both Building 1 and Building 4.

Further work was done this season in Square C7 to explore the location and nature of the main entrance into Building 2 as well as the occupational surfaces associated with this entrance. Excavations confirmed that the doorway to Building 2 is formed by wall C7:23=C4:5, perpendicular to the wall C4:4=C3:8, shared with Building 3. Two use layers were discovered outside of the entrance to Building 2, one dating to early Iron Age I and the other to early Iron Age II. The first occupation layer consisted of bedrock with leveling fill in the low areas of the bedrock to create an even surface. Outside of Building 2, this floor (C7:17=18) is covered with an ash layer (C7:16=22) and destruction debris (C7:14=15=21), that is sealed under the second occupation floor (C7:13=20). The ash layer on the early Iron Age I floor outside of the entrance to Building 2 contained many food-preparation implements, including a quern, several loaf-shaped grinders, hand grinders, and pounders. Worthy of mention is the partial nature of many of these objects, perhaps suggesting that they



10. Field C squares excavated in 2023.

had been discarded outside of the building prior to its destruction. The ceramics and objects on and in the second occupation surface (C7:13), continue to indicate destruction in the early Iron Age II.

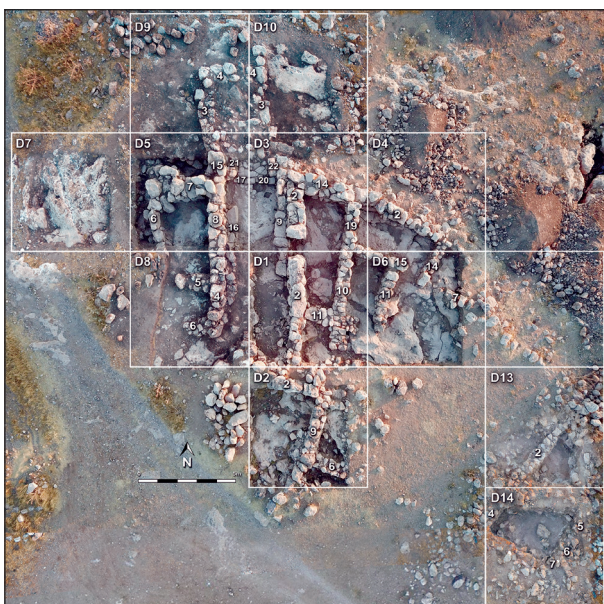
Field D

Field D, supervised by Talmadge Gerald, is located on the northernmost edge of the site (**Fig. 11**). In 2023, two partially excavated squares (D9 and D10) were reopened, with excavation completed there this season, along with two new squares (D13 and D14), which were opened and partially excavated. The goals for the 2023 summer excavation were to reach a better understanding of the gate complex in relationship with the outside approaches to the gate complex, the casemate defenses, and the adjacent buildings.

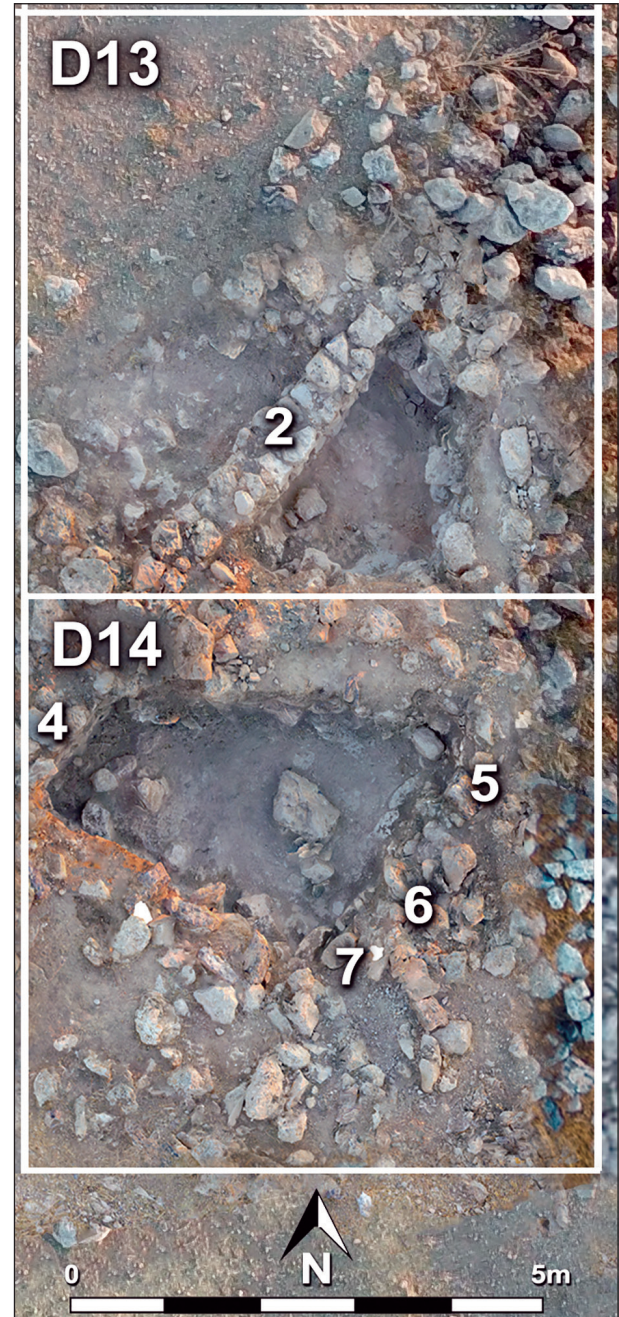
Two squares (D9 and D10), located outside the gate house were reopened to investigate the remnants of the stone architecture which was visible on the surface. In general, the earth matrix in Field D is extremely shallow with bedrock sometimes emerging within 0.10cm below the modern unexcavated surface in some places. Squares D9 and D10, were excavated to bedrock, revealing two one-course walls (D9:3 and D9:4=D10:4), which allowed for an eastern access into the site over a stone threshold (D10:3). These squares yielded only a small amount of pottery and no occupational

surfaces, although an Iron Age I jar (or jug) rim was found just above bedrock (D10:2) in Square 10. There is a steep slope to the north of the gatehouse where water run off likely washed away much of the remaining material from the Iron Age occupation.

Two new Squares (D13 and D14) were opened further east (**Fig. 12**). Square D13 can be traced along the line of the inner casemate wall (see **Figs. 3** and **11**), with Square D14, just south of it. These squares were opened to



11. Field D.



12. Field D squares excavated in 2023.

hopefully reveal additional structures on this part of the site, close to the gate. In Square D13 a northeast-southwest wall (D13:2) ran throughout the square. A surface (D13:5) with parts of two storage jars and 75 Iron Age I body sherds, some of which possibly belonged to these same jars, was excavated immediately to the southeast of the wall. Bedrock was reached in part of the square (D13:10). The wall (D13:2) discovered in Square D13, also ran into the northwest corner (D13:2=D14:4) of Square D14. In the eastern part of that square, another, as yet not clearly identifiable structure (D14:5, 6, and 7), consisting of two pillars, part of a wall, and possibly a doorway, was also located. Bedrock (D14:3) was reached in part of the square.

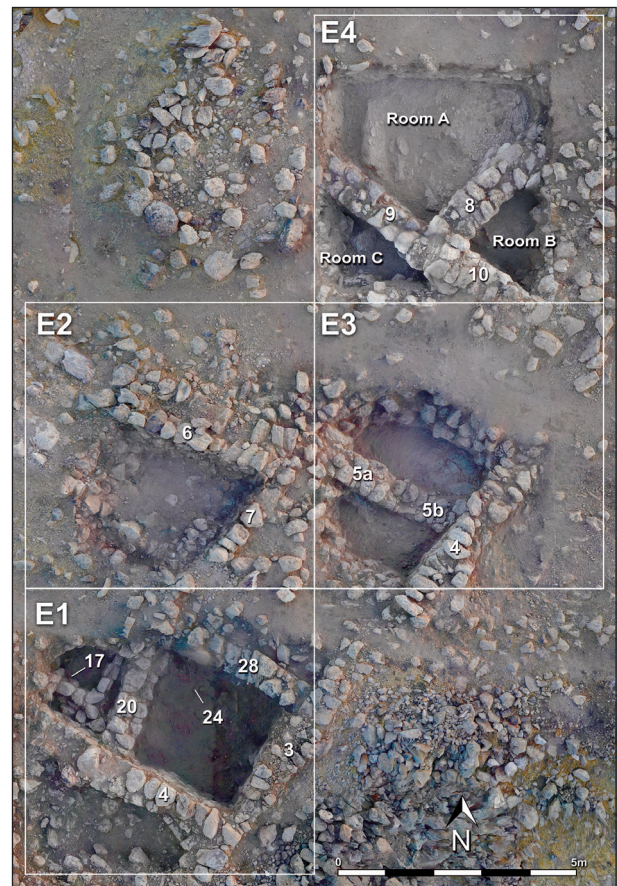
Field E

Field E, supervised by Robert Bates, is located at the highest point of the site, near the main control point (MD1, see **Fig. 2**). This area was originally chosen for excavation because the highest elevations of a site are typically reserved for cult places and other important buildings, like administrative centers and elite living quarters. In 2023 one new square (E2) was opened, with work continuing in Square E4 from the previous season.

Square E2 is located north of Square E1, west of Square E3, and southwest of Square E4 (**Fig. 13**). Two walls were visible on the surface, with one (E2:6) running east-west as a continuation of Wall E3:5 in Square E3, and another (E2:7) oriented north-south, abutting Wall E2:6, that may have eventually connected to the north-south wall (E1:20) in Square E1. A modern inhumation burial, found in the topsoil on the south side of Wall E2:6 and east of Wall E2:7, was removed for reburial. Much of the square south of Wall E2:6 consisted of medium to large boulders that had collapsed from Walls E2:6 and 7. This debris was removed to a depth of 0.5m. Preliminary ceramic readings suggest that there may have been at least two occupational phases. The initial early Iron Age I phase, which ended in a building collapse, was followed by a late Iron Age I phase, built after Wall E2:6 was repaired.

Square E4, originally opened in 2022, is located north of Square E3 and northeast of Square E2. However, the common wall (E1:3=E3:4)

that passes through Squares E1 and E3 runs to the east and can be seen on the surface just outside of this square. Square E4 is subdivided into three areas by three walls (E4:8-10). The main wall, *Locus* E4:8, is 3.40m long and oriented 45 degrees northeast. The two other walls (E4:9-10) abut Wall 8 and are oriented 49 degrees northwest and 125 degrees southeast, respectively. All three walls consist of two rows of 0.30×0.40m unhewn, partially faced hard limestone and chert boulders. The north face of Walls 8 and 9 form Room A, the largest of the three rooms, where five hard-packed surfaces (*Loci* E4:11 and E4:13-16) with flat-lying pottery, dating to the early Iron Age I were found in 2022. The east and north sides of Walls 8 and 10), respectively, form Room B, where medium-large boulders and debris from these walls had collapsed. Room C is on the south side of Walls 8-10, where a single hardpacked surface (E4:20) was found, sealed against these walls. It appears that Wall 10, which divides Rooms B and C, abuts the unexcavated portion of the main wall (E3:4) in Square E3.



13. Field E.

The 2023 excavation in Square E4 continued exploring Rooms A-C, excavating each to bedrock. One additional hard-packed surface was found in Room A this season, supported by many small cobblestones, laid over hard-packed bricky material and filled with earth. Room B contained a single hard-packed floor with a foundation of small cobblestones. However, in Room C, only a few cobblestones were used as a foundation to support the floor compared to the other rooms. In Room B, a largely intact early Iron Age I pyxis vessel (Object S0164, *cf.* **Fig. 14**) was found in the square's southeast corner next to Wall E4:10, near the east balk. A quern and a loaf-shaped grinder were also found near this vessel, by Wall E4:8. Botanical samples were collected from all three rooms, with a preliminary result of cereal plants and some grape seeds found on or in the beaten-earth floors of each room. The pottery results suggest these three rooms (A-C) were built during early Iron Age I and were occupied until wall collapse rendered them uninhabitable.

Preliminary Conclusions

The results from the fifth season of excavation continue to indicate that the first settlement

at Khirbat Aṣ Safrā was established during early Iron Age I, possibly as early as the late 13th century BC. Part of this settlement was at least partially destroyed by fire later in Iron Age I, reflected by an ash layer of varied thickness in the northern and eastern parts of the site, as revealed in Fields C and D. Following this destruction, the site was reoccupied until sometime early in Iron Age II, when it was destroyed a second time, most likely by an earthquake. Some post-destruction squatter occupation following the earthquake is possible based on a few late Iron Age II sherds found on occasion. There was then a hiatus at the site until the Byzantine period, at which time a significant structure was built in Field A. About halfway through the Byzantine period occupation, this building was destroyed by a major conflagration, after which it was at least partially rebuilt. Some pitting activities in Field B, and surface sherds found throughout each of the excavation fields also indicate occupation during the Byzantine period. This final occupation of the site ended with another earthquake, probably in the late Byzantine or the early Islamic period.

The preliminary phasing of Khirbat Aṣ Safrā appears to be as follows:

Phase	Period	Field
Occupational Phase 1	Byzantine Period	A structure, B pits, B, C, D, E sherds
Occupational Phase 2	late Iron I - early Iron II	B, C, E reused buildings, A, D sherds
Occupational Phase 3	Iron Age I	A, B, C, D, E, fortifications, and buildings



14. Early Iron Age I Pyxis (Object S0164). Photo by Robert D. Bates.

As in the previous seasons, the excavations in 2023 yielded mostly small finds connected with agricultural and domestic functions. Of the 153 objects discovered this season, 99 were related to agricultural and domestic activities. In addition, 17 textile objects were also uncovered, with five recreational (gaming piece) artifacts, and six items of jewelry; again, mostly beads. Three architectural fragments were found for the first time this season.

Based on the ceramics and objects found so far, it appears as though the site of Khirbat Aṣ Safrā generally represents a domestic settlement, with an emphasis on agriculture and some cottage industries. However, at least seven Egyptian or Egyptian-inspired artifacts, including a seal, a scepter, and seated Egyptian statue, suggest that Khirbat Aṣ Safrā played a more significant role in the region.

Logistics

Robert Bates has continued to make innovations to the digital field database. The system uses FileMaker Pro Software, and runs on the FileMaker Go App, on iPads. As usual, progress shots and end-of-the-season photography were taken with a digital camera mounted on a Wonder Pole™ (a telescoping device with a camera mount on top) using a blue tooth connected mobile phone to activate the shutter. The numerous images are combined to create 3D images using Metashape Photoscan Pro software. In addition, this season the Safra team experimented with 3D LiDAR digital photography in every field.

Botanical Analysis

Thanks to a faculty research grant from Andrews University, the Khirbat Aṣ Safrā team once again collected botanical samples from the excavation fields for archaeobotanists Annette Hansen and Frits Heinrich, who spent two weeks on site dry sieving these materials and preparing the samples to be sent to their laboratory in the Netherlands for further analysis, the latter with the help of the staff at the *American Center of Research*. According to their preliminary on-site analysis of this season's botanical assemblage, it included the presence of cereals (hulled wheat, and barley), pulses (lentils, including peas), and fruits (grape and olive).

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THE 2021-2022 UNIVERSITY OF VIENNA EXCAVATIONS AT AL JUMAYL (JORDAN) PRELIMINARY REPORT

Basema Hamarneh, Michaela Löffler-Leutgeb

With contributions by:

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Introduction

BH

Since 2019¹, the University of Vienna has undertaken archaeological research at the village of Al Jumayl, located at the southern limit of the former Byzantine diocese of Mādabā and a few km southwest of the World Heritage Site of Um er-Raṣāṣ. Since the first brief site survey in 2018, the rich diversity of the pottery assemblages, the well-preserved buildings, the number of water cisterns, and the traces of ancient agriculture have appeared to be a very promising investigation area. The intention of the research project is to understand the role of the rural settlement from a holistic perspective by addressing its anthropogenic changing landscape, built environment, material culture, land use, types of crops, water resources, environmental conditions, and economic network. The data obtained will allow us to understand how these elements influenced the development of the Byzantine and Islamic village, and whether specific conditions played an instrumental role in its demise. The subsequent excavation campaigns (2019–2022)

have yielded data from a rich archaeological context in connection with layers of use, abandonment, and reuse.

The two campaigns (2021–2022), the preliminary results of which are presented here, focused on one coherent area of the Late Antique village, namely its main religious building. The structure stands on the lower terrace following the natural topography of the site (**Fig. 1**). The relatively steep rocky slope descends towards the wadi delimiting the site from the south and features several cisterns allowing the regular harvesting of rainwater. The structures visible on the surface are mostly built from spolia and appear to be of a later date (18th to early 19th century). The ecclesiastic building stands on the western edge inside a wider rectangular enclosure; it comprises two adjacent single nave buildings each with its own apse, and a square building with several rooms to the north. Savignac, in his visit to the site around 1932, was the first to identify one of the two churches, followed by Piccirillo who saw the same building (Savignac 1936: 242; Piccirillo 1989: 260–261).

The excavation in 2021 uncovered the existence of a second adjacent sacred building, which was completely hidden by collapsed arches and thick layers of debris. The exceptional conservation of the walls, the vault corbels, and the support system of the hemispherical dome covering the presbyterium, together with the remains of the collapsed roof, allows the

1. The excavation is directed by Basema Hamarneh (BH). The texts by team members are indicated as follows: Ivana Djodjevic (ID), Roland Faltejsek (RF), Estera Golian (EG), Ines Guth (IG), Alexander Habrich (AH), Thomas Leutgeb (TL), Michaela Löffler (ML), Franziska Male (FM), Leonard Pamme (LP), Lisa Schlamp (LS), Marie Therese Schmid (MTS), Kai Schoder (KS), Lea Struck (LSt); and Anna Walter (AW).



1. General view of the site (Plan by T. Leutgeb).

building to be categorized among the all-stone structures well known in the *Hūrān* area, but less common in the diocese of *Mādabā*. The church itself incorporates a significant number of *spolia*, which possibly came from earlier unidentified buildings, its internal walls were plastered, and the floor covered with mosaics, which were only partially uncovered in the 2021–2022 seasons. The research methodology focused on cleaning and delimiting the external walls and proceeded with three main tasks: the stratigraphic excavation, the survey, and the documentation of all notable features of the site (buildings, architecture, water resources, agricultural features *etc.*) through digital documentation (see below).

Stratigraphy

TL, FM, AH, EG

A preliminary stratigraphic assessment was made during the excavations of the overlapping trenches F04 and F05 in 2021 and 2022 at the site of a church set in the south-western

part of Al Jumayl. In trench F04 parts of a presbyterium concluded by a semi-circular apse as well as the building's pavement were identified. F05 comprises the northern church wall, the remainder of the presbyterium and five rows of pilasters along the nave.

Following the discovery of five structural arch collapses, and due to the volume of debris and the archaeological complexity, the excavation team decided to delimit the investigation to the trench's eastern section. Therefore, all strata west of arch collapse 2.2 were left untouched for the time being. During the two excavation seasons, 101 stratigraphic entities (hereafter SE) were documented and set into a singular matrix. Finds and architectural features allowed for the preliminary subdivision of the stratigraphic model into six chronological periods.

Recent Superficial Layers

The uppermost strata consisted of mixed and disturbed debris, containing accumulated sand,

quarry stone rubble, and one loose impost (SE F04_03). The eastern area of the excavation trench was strongly affected by damage through a modern looting interface (SE F04_11). Under these circumstances, naturally, the finds assemblage consisted of incoherent material deriving from various periods, the most recent finds being plastic food packaging of the last ten years. The pottery sherds were mostly of Ottoman and Mamluk origin, corresponding to the pottery typologies collected during the on-site survey conducted prior to the archaeological investigations.

Mamluk

The first undisturbed layers, beginning with SE F04_07, were dated to the Mamluk period, since typical Mamluk pottery sherds were found in abundance and represented the youngest finds. Two Mamluk phases must be differentiated: the first being the collapse of then still-standing Byzantine building; the latter being a second habitation phase.

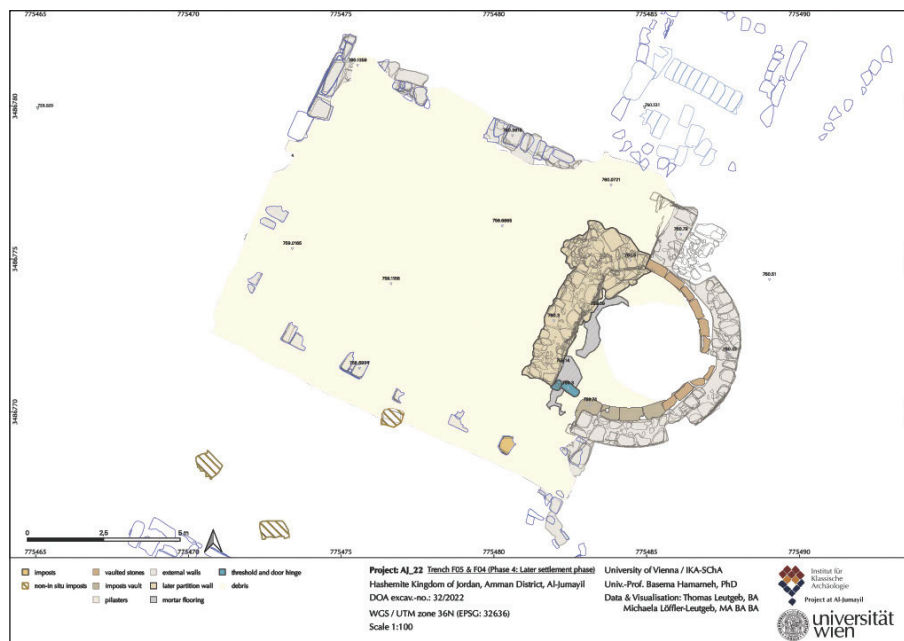
Second Habitation Phase

This second phase is identified by 1a dry-stone wall without proper foundation (SE F04_16) (**Fig. 2**), the remains of two lime mortar pavements (SE F04_18 and F04_19), a threshold, a door hinge (SE F04_14), and the reutilized upper section of the Byzantine apse wall (SE F04_21, F04_22, and F04_23).

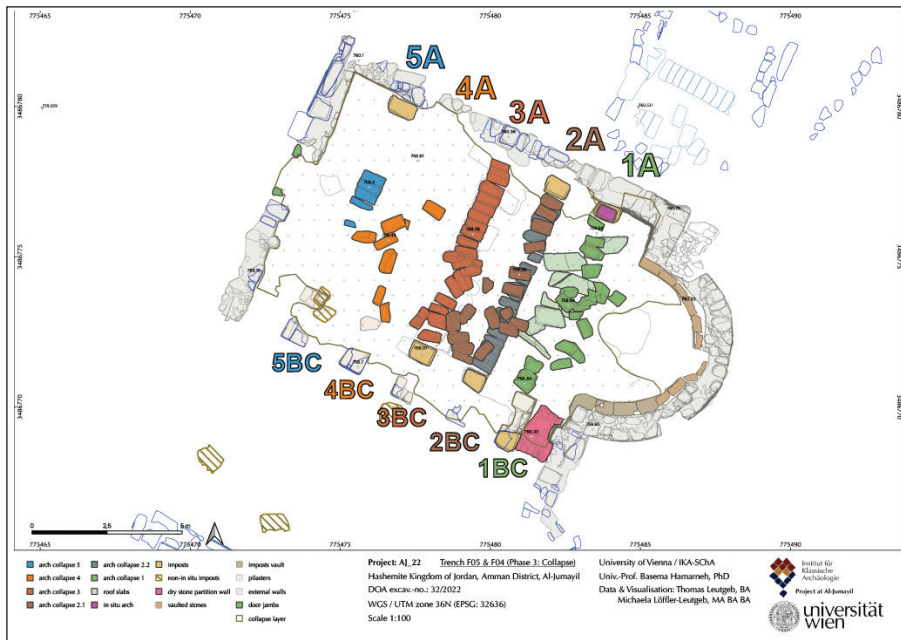
The eastward facing dry-stone wall running north-south (length: 5.5m; width: 1.2m; height: 1.3m) and consisting of three to six loosely layered courses of rubble of varying size was built directly above the underlying-debris and the structural collapse of arch 1 (SE F05_03). Thus, the wall and the area delimited by the apse formed a separate room with its entrance facing south. The room had a lime mortar floor, however, massively damaged by the aforementioned modern looting hole, and it could be documented only in fragments. During the dismantling of wall (SE F04_16), pottery sherds of various origin were collected, again showing the wide array of archaeological periods present at the site. The most recent of these sherds have been dated to the Mamluk period.

Structural Collapse (Fig. 3)

Following the partial removal of (SE F05_08), the building's limits gradually became visible. Beneath the second phase, five rows of structurally collapsed arches (SE F05_03, 04, 05, 06, 07) embedded in two thick layers of debris (SE F05_02, 08) were unearthed. The debris consisted of mostly rubble, some ashlar stones, stone roof slabs, and a large number of elongated mosaic tesserae cut of local limestone. Also, some roof slabs still showed traces of elongated mosaic tesserae mixed with resistant lime mortar (see infra "Architecture").



2. View of the later settlement phase in the church (Plan by T. Leutgeb).



3. The collapsed arches and roof slabs (Plan by T. Leutgeb).

So far, the collapsed arches 1 to 3 (SE F05_03, 04, 05) have been documented at full length, respectively running north-south, from one pilaster to the other, spanning over a clear width of 6.5m. Of arches 4 and 5 (SE F05_06, 07) only the upper arch stones could be documented, with arch 5 seeming to have collapsed in a slightly less disordered manner.

The collapse of arch 1 (SE F05_03) consisted of 21 arch stones, with stone roof slabs (SE F04_25) lying below and above. Collapsed arch 2 displayed two layers of arched stones, one above the other, which were documented as arch 2.1 (SE F05_04) and arch 2.2 (SE F05_28). The former displayed 17 arched stones, and the latter 18 stones. Collapsed arch 3 (SE F05_05) had 21 arched stones, but, it has been documented only superficially. It cannot be said whether all arches collapsed simultaneously; nevertheless, the presence of Mamluk pottery within the layers surrounding the collapsed architecture of this specific part of the Byzantine building suggests this chronological range for its disintegration.

Destruction Strata

After the removal of the collapsed arches 1 (SE F05_03) and 2.1 (SE F05_04), as well as of the last few decimeteres of debris (SE F05_08) in the eastern part of the excavation trench, two extensive burnt layers (SE F05_25, 26 = SE F04_29, 31) were unearthed. The first layer (SE F05_25) consisted of blackened burnt

material, mostly charcoal, which was collected for analysis. The form and aspect suggest the burning of an elongated wooden structure. The subsequent layer (SE F05_26) was of fine greyish ash. The pottery sherds within the burnt layers suggest a dating to the Fatimid period.

Abandonment layer (Fig. 4)

Just above the building's pavement a widespread thin layer of fine, yellowish, compacted sand (SE F05_29 = SE F04_32), fleeting in nature, was identified in various thicknesses, ranging from 0.1cm to 2cm. This was interpreted as accumulated sand, which presumably made its way into the structure after the building's abandonment. Pottery sherds and finds within this stratum also suggest a dating to the Fatimid period.

Byzantine Structures (Fig. 5)

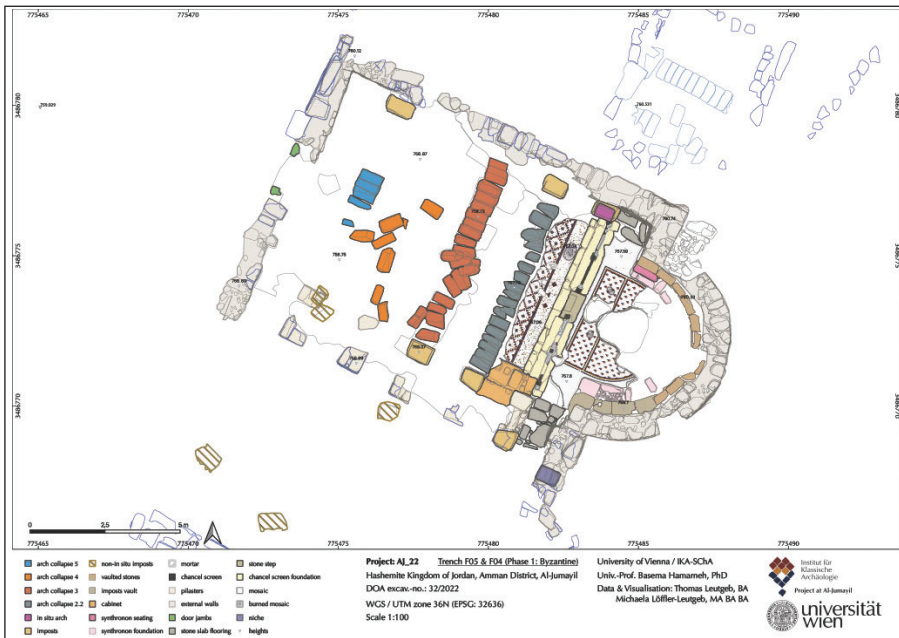
The removal of the sand stratum (SE F05_29) allowed a full view of the building, with its perimeter walls visible in elevation (3.02m in the building's north-eastern corner). The removal of the last stratum allowed a view of the mosaic floor of the presbyterium and parts of the mosaic within the nave.

Built-in Secondary Structures (Fig. 6)

Between pillars 1BC (SE F05_42) and 2BC (SE F05_43) on top of a slightly elevated part of the mosaic pavement (SE F05_60), and above



4. The three abandonment levels: a. burnt ash layer (SE F05_25); b. burnt charcoal layer (SE F05-26); c. drifted sand layer (SE F05-29).



5. The excavated part of the church floor (Plan By T. Leutgeb).

of the foundation (SE F05_39) for the chancel screen, a built-in structure was uncovered. It consists of a rear wall (SE F05_31) delimited by the two aforementioned pillars, a protruding wall (SE F05_30) built on the chancel screen foundation, and a horizontal, rectangular, flat stone slab (SE F05_59) with two oblong interfaces (SE F05_58), possibly a trace of the negative impressing of a now-removed object. The built-in structure showed multiple layers of fine plaster (SE F05_32). Another later addition to the original layout was a wall, constructed with loosely layered rubble, which was installed between pillar 1BC and the building's eastern outer wall. It blocked the passage to the adjacent southern second church/nave.

Original Layout

The original building's earliest layers were formed by the two mosaic pavements (SE F04_27, SE F05_56), which must have been damaged already before the abandonment of the building, since some holes (SE F05_63, 64, 69) were also covered by the fine sand layer (SE F05_29). Also, three spots where the mosaic tesserae were darkened by fire (SE F05_65, 66, 73) may have stemmed from the building's utilization timespan.

The mosaic's foundation layers can be conveniently seen in the section of the apse's central looting hole. The mosaic is embedded in fine mortar bedding or *supranucleus* (SE F04_35), rich in lime, which is set on a firm, solid, 8-10cm thick layer comprised of a mixture of



6. Built-in niche.



7. Orthophoto of the church building.

small stones and coarse mortar (SE F04_28), also known as *nucleus*). Under this, an orange-brownish, compact levelling layer (SE F04_36) of 7-11cm thickness was set above an at least 42cm thick layer of a looser, greyish-light brown sand layer containing rubble and mortar remains (SE F04_37), which may have possibly corresponded to the *rudus*.

The mosaics and their bed stratigraphically superpose all adjacent architectural elements, most notably the foundation for the chancel screen (SE F05_39) and the synthronon (SE F05_34), as well as the slab flooring in the building's north-eastern corner (SE F05_35) and east to pillar 1BC (SE F05_36). These architectural elements lean against the building's perimeter wall, which is interconnected with pilasters 1A, 2A, and 5A. Of these, pilaster no. 1A stands out the most; atop an impost, it still preserves two stones *in-situ* showing the beginning of the curve of the arch. Hitherto, five other imposts (2A, 5A, 1C, 2B, 3B) have been found at their original place; two others,

namely 5B and probably 1B (SE F04-03), were found mixed into the trench veiling debris.

The building's central focal point, the apse, is also interlocked with the adjacent walls and must have been erected, at least in part, before the foundations for the interior architecture. The apse's walls consist of a firm, layered ashlar masonry (SE F04_23), 1.95m in height, a layer of imposts (SE F04_22), and 1 to 2 layers of arched dome stones (SE F04_21) still *in-situ*. A highly disturbed niche, which could not be excavated due to its fragility, is set directly in the centre of the apse.

Architecture of the Church (Fig. 7)

ML

The church complex of Al Jumayl was built on the southern slope of the hill; it has an axial west-east orientation and covers an area of approximately 258 square metres. The complex is comprised of two adjoining churches. Currently, the only known entrance is located in the northern section of the

building's western wall. To the south, the complex incorporates the settlement's massive boundary wall into its structure. The eastern side is characterized by two apses of slightly differing size. The northern outer wall of the church is shared with an unspecified building complex. (Structural relations between these two complexes are still to be clarified in further research.) The outer walls of the church are made of well-dressed ashlar, although of various shapes and sizes. At the corner areas the stones are carefully interlocked. The two adjoining naves of the church complex are both the same size 7.9m wide and 11.2m long and separated by five rows of double pillars that are partly visible. The respective opposing faces of the northern and southern walls likewise display five rows of pillars. The architectural structures of the southern nave have been exposed to environmental impacts as well as looting activities. However, two pictures by Savignac document the southern naves former appearance in 1935.

Trench F04 (2021-F04) and trench F05 (2022-F05) were set over the northern part of the church complex. This area has been well preserved due to a high amount of collapsed material covering it.

The Nave

The nave is entered through a central opening in the western outer wall, where two stones of a door frame (SE F05_52) were documented. The nave is flanked by five pillars (1A to 5A) along the northern wall and, as separation elements, by five pillars (1BC to 5BC) to the south. The pillars are partly crowned by *in-situ* imposts, made of square coquina stones, with a straight, angular form that resembles traditional Nabataean/Roman style. (Netzer 2003: fig. 209, 222).

For the moment, the western part of the nave is still filled with rubble reaching the elevation of the *in-situ* imposts. Structurally collapsed arches have been excavated in-between the area delimited by pillars 1A+BC and 3A+BC. The arches supported the ceiling construction, which was made of elongated rectangular slabs (approximately 180×51×21cm) that were found among the collapse strata. Also, a great number of roughly cut, rectangular tesserae,

which seem to have been a biproduct of mosaic work, were found within the building's rubble. By all indications, they were used as temper for roughcast. This is evident from the observation of lime mortar chunks mixed with the abovementioned tesserae. In some instances, this lime mortar plaster was found still applied to one side of the roof slabs with tesserae attached to it (**Fig. 8**).

The nave's eastern part, beginning at pilaster 2A+BC, has been excavated to the floor level, which is covered by a polychrome mosaic with geometric and floral patterns. To the south, a built-in niche (**Fig. 6**, SE F05_30, 31, 32, 58, 59) is located between pillars 1BC and 2BC. The niche (SE F05_59) is set directly above the floor mosaic (SE F05_57) and consists of a large rectangular fossiliferous limestone slab on a thin rubble bedding. Carved into the bottom slab are two rectangular indentations (IF F05_58) with lime mortar residue. The niche's eastern wall (SE F05_30) was built to the north of pillar 1B and is set on top of the two steps (SE F05_74) separating the nave from the presbyterium, while the southern wall (SE F05_31) of the niche is set between pillars 1BC and 2BC. Both niche walls are made of smaller fossiliferous limestone plates and a mixture of quarry stones. Lime mortar functions as a binding material, while the niche's interior surfaces are coated with remains of lime plaster (SE F05_32). There is no visible interconnection between both walls (SE F05_30 and 31). The niche's hypothetical western wall has not yet been excavated, since it is still covered by the arch collapse 2AB.



8. A roof slab with mortar and elongated tesserae.

The Presbyterium

Between pillars 1A and 1BC, an elongated step construction (SE F05_39, 74) of two layers of fossiliferous limestone ashlar spatially separates the northern nave from its slightly more elevated presbyterium. Recesses in the step construction's upper ashlar layer (SE F05_39) function as inlets for the chancel screen (SE F05_40), which spans the width between pillars 1A and 1BC but leaves open a central 77cm wide passage, where a stepped stone (SE F05_74) is incorporated into the substructure.

Lower edges of the black oil-shale chancel screen were found *in-situ*, fixed into the sockets and grooves by means of lime mortar (SE F05_57). Chancel screen fragments have also been found in surrounding layers (J22S-19/V-1+2, J22S-29/V-1+2). The mosaic (SE F05_27) covers most of the presbyterium and stretches into the northern apse. The mosaic is flanked to the north by a niche area (possibly used as a *prothesis* – Stankovic 2021: 336), which is slightly hidden behind pillar 1A and paved with stone slabs. To the south the mosaic ends slightly before pillar 1BC and is succeeded by a stone slab covering a connection to the presbyterium of the adjacent church. The connecting corridor also featured the remains of a later built-in arch (SE F05_20) made of small rubble stones stretching from the eastern exterior wall to pillar 1BC.

The Apse

The opening of the apse is 3.5m wide and it has a depth of 2.6m. The remaining walls of the structure are still standing to a maximum elevation of 2.8m.

The inner wall is composed of four architectural elements: the apsidal vault (SE F04_21), the imposts (SE F04_22), the substructural wall (SE F04_23), and a central niche. The remaining vault (SE F04_21) consists of cut fossiliferous limestone stones. Along the northern part of the apse, two rows of fallen vaulted stones remained *in-situ*. These cut stones measure approximately 62×37×28cm and are slightly curved inwards.

The vault stones rested on top of flat, elongated, imposts (SE F04_22), likewise made of whitish-beige, cut fossiliferous limestone. The imposts remained *in-situ* along the semi-

circular structure of the apse, only being absent above the niche. The stones used here measure roughly 72×105×15cm and have a well-rounded edge facing the inside of the apsidal space. Underneath the vaulted stones, the imposts protrude about 10cm. The actual apsidal wall (SE F04_23) is preserved up to a height of 1.8m.

It is constructed of alternating layers of large, roughly worked ashlar and compensation layers containing smaller quarry stones. The bottom layer is built of large ashlar stones, measuring about 30×40×20cm. The succeeding compensation layer is executed in small rubble stones, measuring about 8×10×22cm. As a result of erosion effects, there are several voids along the structure and the joints are washed out. The apse's semi-circular central niche, due to instability resulting from erosion processes and looting activity, could only be excavated in part. Its opening is 1.1m wide, and its depth is approximately 45cm.

A synthronon (SE F05_33, 34) was found along the apsidal wall. It consists of one remaining bench stone (SE F05_33) and better-preserved foundations (SE F04_34, F05_34). The bench stone measures 90×30×25cm and leans, along with its backfill, against the apsidal wall. The underlying synthronon foundation (SE F05_34 and F04_34) is made of cut stones that protrude inwards up to 15cm. They constitute a 5cm high framing for the mosaic (SE F05_27) along the apsidal wall.

The Second Church

As mentioned, the state and location of the church on the southern side were already known from the image published in 1936 by Savignac; the eastern outer wall of the connecting corridor had a built-in niche that can be seen (SE F05_21), made of large quarry and fossiliferous limestone. The niche measuring 53cm high, 48cm wide, and 46cm deep was plastered with smooth, very fine white lime mortar, some of which remained *in-situ*. Both niches to the north and south of the southern apse might have been used as a *prothesis* (north) to store liturgical vessels and the eucharistic bread and wine, and a *diaconicon* (south) to store liturgical vestments, books, or other sacred items (Stankovic 2021: 336).

Comparable Structures and Architectural Elements

Double-apse churches are extremely unusual in the panorama of Byzantine Arabia, even though some examples have been found in Jordan, the closest being the two churches of Nitl (Hamarneh 2006) and the Church of Haufa (Abu Dalu 1994; Hamarneh 2003: 166). However, the architecture follows the regional typology: the building material is cut local stone, the inner ceiling of the structure is vaulted, and the roof is covered by flat large stone slabs (Krautheimer 1965: 102–103; Mihaljevic 2021: 312–314). The closest comparative example are the churches of Nitl, which are covered very similarly (Hamarneh 2003), some cisterns of Um er-Rasās, and several structures of Umm Al Jimāl that preserve roof slabs *in situ*.

Some *Tegulae* were found within the collapsed material (within SE F04_20, and SE F05_02, 19, 23 and 29) of the nave, the presbyterium, and the apse, but the low quantities do not suggest that the church structure was completely covered by them. Some of the building material, such as the imposts of the pillars, appear to be spolia from another building since all the lower parts are chipped off. The imposts correspond to a typical Nabataean/Roman style. Comparable pieces have, for example, been used in a Nabataean temple dated to the 1st century AD at the site of Tall Al Lāhūn (Homès-Fredericq 1989: 575–580). Later additions of architectural elements such as the niche between pillars 1B and 2B can also be seen in the church of St. Sergius of Nitil (Hamarneh 2006). Such an addition probably had a liturgical importance that still needs to be understood. Further supplementary building activities, for example the additional arch pillar made of small rubble stones attached to the southern corner of the apsis (SE F05_20), the separating wall of rubble stones between the eastern inner wall, and the double pillar 1B/C (SE F05_19), as well as the wall built to close off the apse to the west (SE F04_16), may point to the later use of the church structures in Fatimid and Mamluk periods.

Statistics Pottery

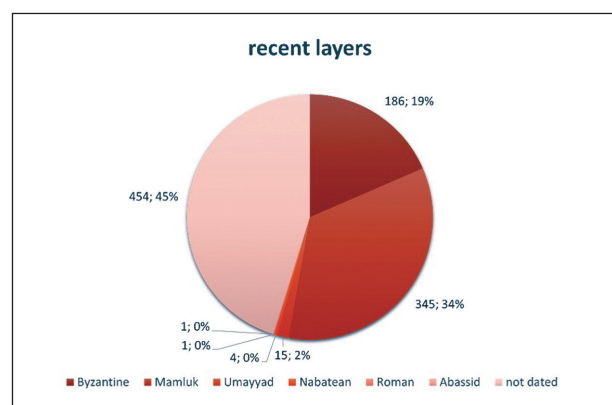
FM

The stratigraphic units of the sections F04 and F05 are uneven. Some layers provided more

pottery, while others were quite poor in finds. Relatively many sherds were recovered from layers SE F04_01 (225) and SE F05_00 (379), as well as SE F05_01 (206), which are recent layers that extend over the entire excavated area. Since these layers were partly disturbed by looting activity, a mixture of pottery from different periods –Byzantine, Umayyad, Abbasid and Mamluk– were found. (**Fig. 9**).

Of course, there were both diagnostic and non-diagnostic sherds in this area. Other layers dated as recent are (SE F04_04, 05, 06, 08, and 09). Except for (SE F04_09), from which 86 sherds were recovered, these layers contained only between 18 and 38 pottery sherds. Again, the spectrum predominantly comprised Byzantine and Mamluk pottery, with three Nabataean sherds in SE F04_06 and one Nabataean sherd and one piece of local, Byzantine terra sigillata in F04_08. In SE F04_09 there was an additional Umayyad sherd. In the entire recent strata, the Mamluk sherds make up 34%, *i.e.* approximately one third of the find material dated so far. The Byzantine sherds amount to almost one fifth (19%) of the total finds of pottery.

The next section is formed by the layers dated as Mamluk. A particularly large number of sherds (372) were recovered in SE F05_02 (= SE F04_20), which extended over the whole area of the apse. Here, too, the spectrum of finds predominantly comprises Byzantine (112) and Mamluk (138) pottery, with only 4 sherds from the Umayyad period. A wall built into the apse area during Mamluk times (SE F04_16), belonging to the second habitation phase, yielded a large number of finds in the spaces between the walls. Here 352 sherds were



9. Pottery statistics of recent layers.

recovered, again mostly of Mamluk date (208), some of Byzantine date (86) and 3 of Umayyad date. The remaining Mamluk-dated layers, which belong either to the second habitation phase (SE F04_07, F04_17, F04_18, F04_19) or to the time of the structure's collapse (SE F05_08 (= SE F04_26)), contained between 9 and 46 sherds, of which again the majority was Mamluk, followed by Byzantine sherds, and in almost all of these layers 1 to 4 Umayyad sherds were found. While Umayyad sherds account for only 1% of the total pottery finds of the layers stemming from the Mamluk period, 30% were Byzantine and nearly half of all sherds (49%) were dated as Mamluk – in addition to some sherds which still remain to be dated. (**Fig. 10**)

In the destruction horizon of the Byzantine building only two layers contained (little) pottery: SE F05_25 (= SE F04_29) with 4 sherds (of which 3 Byzantine and 1 Mamluk), and SE F04_30, from which 9 sherds were recovered. The next earlier phase is the Fatimid phase or the period of the building's abandonment. Here, 70 sherds were recovered from SE F05_29 (= SE F04_32), dating to the Byzantine, Umayyad, and Fatimid periods. Finally, from the oldest phase, that of the building's construction in Byzantine times, only a few sherds from SE F05_71 (8) and SE F04_36 (1) were recovered, almost all of which can be dated as Byzantine, and only one sherd possibly as Roman.

The pottery sherds that have been found help to date the different layers of sections F04 and F05. Not all sherds have been dated yet; a detailed examination of the finds is ongoing.

Pottery F_04

LS, IG, MTS

SE F04_00 (**Fig. 11 – pl. F04_1**)

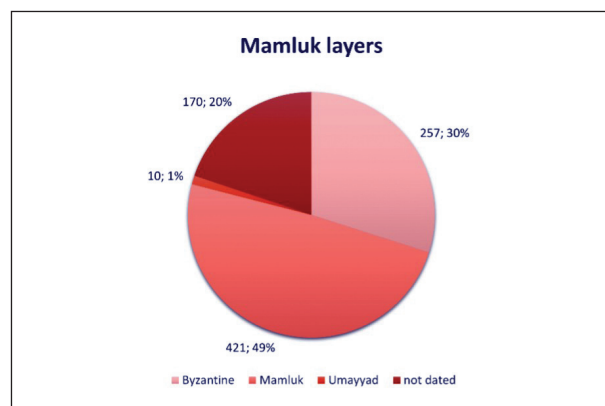
In SE F04_00 a wide variety of pottery was found. The diagnostic pieces can be divided into two groups: open forms (different types of basins, plates, bowls, and cups) and closed forms (amphorae and pots). Most of the pieces of these two groups are well-fired and consist of an orange clay with small white and occasionally black inclusions. The cores of the fabric are mostly greyish and a speculative dating for the pieces J21-IV/00-2 and J21-IV/00-4, -5, -6 is to the Byzantine period. The amphora sherd J21-IV/00-3 has a light greyish colour with red

painted decoration and seems to be from the Umayyad period (Hamarneh and Bianchi 2021: S_26400), while another piece can be dated to the Abbasid period (J21-IV/00-1).

Among the finds from SE F04_00 was a fine Abbasid oil lamp (J21-IV/00-7) with dark brown fabric. Only the shoulder is conserved, which bears decoration consisting of a circle with a Kufic inscription that can be reconstructed as: *Barakat Allah* (God's blessing), and a radiant zig-zag decoration on the discus. The typology of the lamp points to a possible variant of the so-called Jarash lamps (Uscatescu 2021). Another piece with a knife-cut decoration (*Kerbschnittdecor*) can probably be identified as an incense burner; it is the bottom part of a vessel with the remains of a handle, and shows traces of burning on the interior. The decoration is organized in squares, each of which is dissected by a diagonal cross and has triangles cut out of the outer layer. There are small traces of red paint within the cut lines. Parallels to this incense burner have been found in Ju'arah (Ein Hashofet) and 'Ar'arah (*Palaestine*), dating to the 6th century (Taxel and Iserlis 2014: 162–163), as well as at the Sanctuary of Lot, in Dayr 'Ayn 'Abātah, dating to the 8th century (Politis 2012: 184, 199, fig. 358) and in Khirbat Al Mafjar (Baramki 1942: 83, fig. 6, nos. 20-24). However, SE F04_00 reflects the recent surface layer, and a wide range of different vessels from various times can be seen as the result of erosion effects and looting activities.

SE F04_01 (**Fig. 11 – pl. F04_2**)

The oldest piece from (SE F04_01) is a bowl dating to the 1st century AD, which has a strong parallel in Nabataean fine ware (Schmid 2000



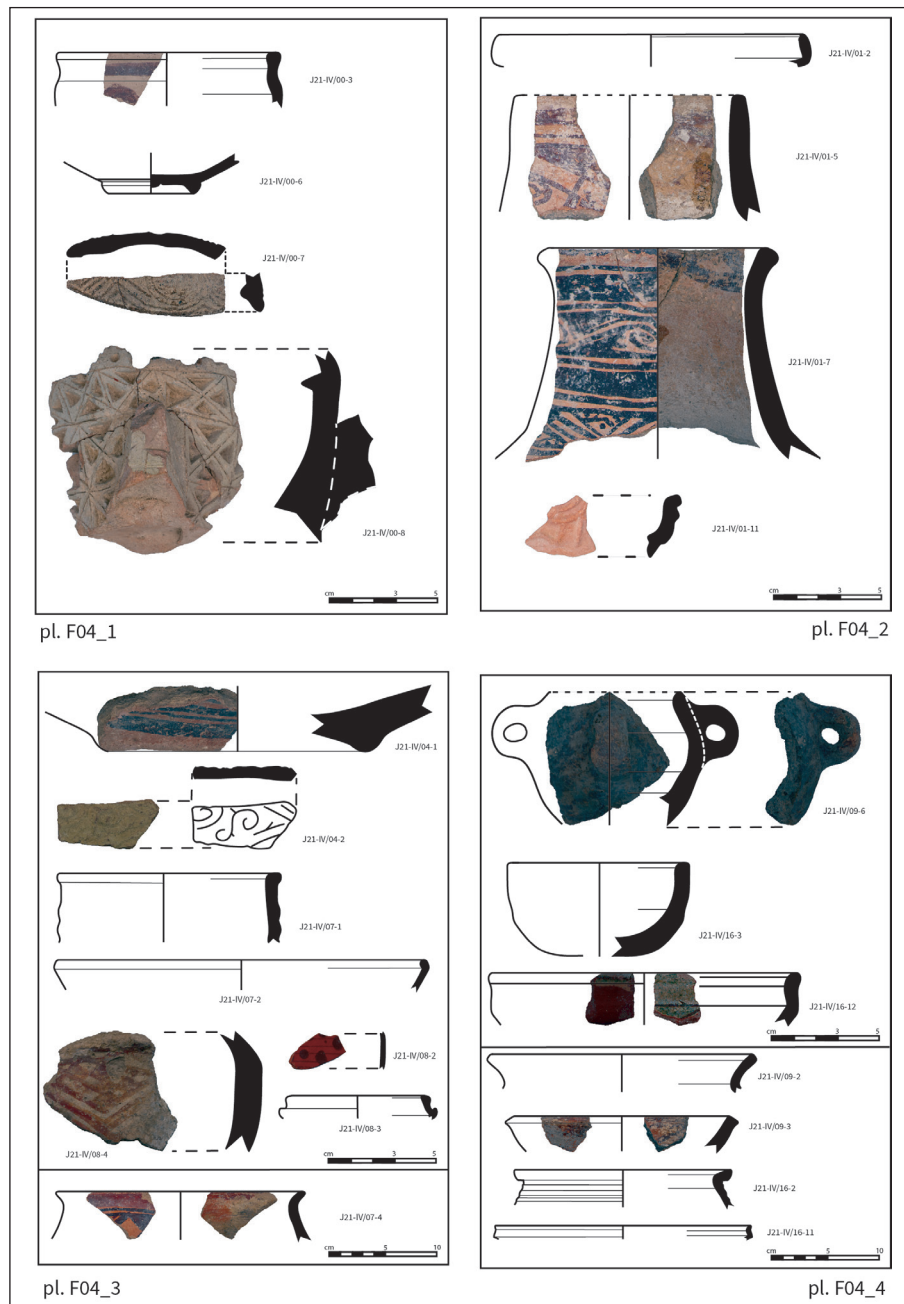
10. Pottery statistics of mamluk layers.

Abb. 101). The majority of diagnostic sherds (J21-IV/01-4, -6, -7, -14, -15) are handmade and some of these are painted in black or brown geometric patterns. The fabric has a lot of inclusions, sometimes consisting of organic material, varies in colour, and is medium-to well-fired. These pieces suggest a dating between the 6th and the 12th centuries (Peterson 2010: 136) and therefore indicate use of the site in the early middle Ages. A smaller group consisting of four pieces (J21-VI/01-1, -2, -3, -11) that are nearly homogenous in fabric and have a bright orange colour with very few, small

white inclusions, can be dated to the Byzantine period. One of these, J21-IV/01-11, is an oil lamp, with a very close parallel found in Jarash that can be dated to around AD 500–550/60 (Uscatescu 2021: *cat.* 151).

SE F04_04 (Fig. 11 – pl. F04_3)

The finds from (SE F04_04) contained four diagnostic sherds, all bowls or jars. The dated ones belong to the 12th–13th century. J21-IV/04-1 is rim of a bowl or a jar with a diameter of 12cm. On the outside it has an orange-reddish slip with darker decorative lines



11. Plates F04_1-4.

on it. The combination of the thicker border line followed by a smaller line up towards the rest of the vessel can be compared to decorations found in Ayyubid/Mamluk patterns and can be dated to the 13th century (Khadija 1992: 354 plate 1 no. 2, no. 18).

SE F04_07 (Fig. 11 – pl. F04_3)

(SE F04_07) comprises a wide range of periods but mostly contains table- and common-ware pottery. Notable finds are the Nabataean bowl (J21-IV/07-2) with traces of slip only on the rim and a rim piece likely belonging to a jug-type vessel decorated with a brown and red geometric design typical of the middle Islamic period, which on its outer surface displays alternating filled and outlined triangles below a continuous line (J21-IV/07-4).

SE F04_08 (Fig. 11 – pl. F04_3)

(SE F04_08) contained five diagnostic sherds dating from the Nabataean to the Mamluk period. The very thin wall fragment J21-IV/08-2 has a red fabric and is decorated with dark red lines and dots on the outer surface. It can be compared to Nabataean decoration for its combination of a background of lines with a cluster of dots and possibly the remnants of a palmette design (Negev 1986: 46, C2, no. 333, 336).

Although the diameter of J21-IV/08-3 is not discernible, its unique decoration can be compared to different types of Byzantine amphorae, for example one from Mount Nebo (Hamarneh and Bianchi 2021: fig. 19-S_25187; Pappalardo 2002: 414, fig. 21-no. 22; Sanmori and Pappalardo 1997: 408, fig. 7-no. 20.)

J21-IV/08-4 is a wall fragment, with a broken rim. Even though the diameter cannot be determined, its decoration and the outside fabric can be compared to Ayyubid/Mamluk pottery. The visible decoration, albeit damaged, shows a check-pattern with thinner double lines surrounding (Khadija 1992: 346, plate 2, no. 45).

SE F04_09 (Fig. 11 – pl. F04_4)

SE F04_09 contained a variety of common-ware, primarily of open vessel forms. The finds can be split into two groups: rough handmade pottery of the early to middle Islamic period

with many inclusions in the fabric and well-fired wares that can be dated to the later Byzantine period. The stratum reflects materials from the collapse of the Mamluk and Byzantine buildings on site.

Two pieces are particularly notable for their large diameter and relatively good quality. J21-IV/09-3 belonged to a wheel-thrown bowl with especially even wall thickness. The piece was painted with a brown geometric design on the inside and outside of the vessel. J21-IV/09-2 was part of a large open vessel and shows a very even surface finish in addition to its wheel-thrown quality. Parallels for this vessel can be found in pots and bowls from Tall Zar‘ā dating to the Byzantine-Umayyad transitional period (Kenkel 2020: 157: Kt35).

Also of note is fragment J21-IV/09-6, a large part of a handmade bowl. The material shows a large amount of air inclusions and a coarse wall that varies immensely in its thickness. Similar ware has been found at other sites, such as Gharandal, albeit with horizontal handles (Walmsley and Grey 2001).

SE F04_16 (Fig. 11/12 – pl. F04_4-5)

This layer comprises the collapse of the Mamluk and Byzantine buildings at the site. The finds provide a highly varied spectrum of several types of pottery including fine tableware, common-ware and storage vessels reflecting several habitation periods. The oldest pieces in the stratum's assemblage date to the Nabataean period, such as J21-IV/16-11, which belonged to a rather large and finely crafted plate. The wall thickness of this piece measures roughly 3mm, typical of the early regional tableware. Similar but much smaller pieces have been found at Oboda (Negev 1986: 61).

A further Nabataean fragment, J21-IV/16-4, has a dark reddish outside and inside; it is very wellfired and has a wall thickness of 0.2cm. In addition, the sherd has distinct decorations drawn in a shade of red darker than that of the fabric. These decorations and the wall thickness can be compared to typical Nabataean tableware (Erickson-Gini 2016: 56, fig. 10 - no. 4). The decoration can be classified as a criss-cross pattern and dots, whereby the dots are used to divide the field into different zones that then are decorated by different line patterns (Negev

1986: 44, no. 316, 317, 318).

A younger piece of tableware, J21-IV/16-12, dates to the Abbasid period. It is very smooth, even, and finely glazed. The rim is green glazed while the outside is covered by a thin white glazing with brown lines towards the bottom of the sherd, showing a horizontal line with a zigzag-design beneath it. Glazing on the inside is not preserved except on the rim area.

The body sherd J21-IV/16-14 is very wellfired and on one side shows decoration in white glaze atop green and black colouring. The green glaze seems to have covered the whole sherd whereas the black lines form a geometrical pattern. This system of decorating can be compared to sherds from the 13th century (Avisar and Stern 2005: 138, pl. V. 2, type I.1.5.1).

The common-ware likewise reflects a variety of forms. Most notable is J21-IV/16-3, a very uneven and roughly made small bowl dating to the middle Islamic period, which likely contained materials such as creams or seeds. These bowls are commonly found for this period and were often stackable (Makowski 2020: 585).

Furthermore, fragment J21-IV/16-2 provides a good example of the storage vessels commonly found in the area. The outside of the wheel-thrown jar was left rough and decorated with a vast number of horizontal linear grooves. Parallels have been found locally: for example, on Mount Nebo (Hamarneh and Bianchi 2021: 116, fig. 4).

J21-IV/16-6 is a rather uncommon piece with decoration made using a knife-cutting technique, similar to the technique used on the oil lamp from (SE F04_00).

SE F04_17 (Fig. 12 – pl. F04_5)

(SE F04_17) yielded four diagnostic pieces, and one decorated wall fragment. The datable pieces belong to various centuries ranging from the 6th to the end of the 12th.

Sherd J21-IV/17-1 is a diagnostic base fragment that probably belonged to a bowl or plate due to its diameter of 9cm. The outside shows a reddish glaze and the inside still shows complete coverage with a dark brown glaze and a decorative line in green glaze. This piece can be dated into the Mamluk period, as this type of

glaze was very popular in the second half of the 12th century (Avisar and Stern 2005: 20, fig. 7, type I.1.6.2). Based on these comparisons, the piece could be considered a bowl rather than a plate.

The pieces J21-IV/17-4 and J21-IV/17-5 belong to one vessel, probably an amphora. It has decorative grooves on the outside and opens up at the end of the sherd into the body of the amphora. There are also traces of grooves on the inside. It can be dated into the 6th century AD (Hamarneh and Bianchi 2021: fig. 14, S_26214).

The fragment J21-IV/17-6 is an interesting diagnostic piece. The thickness of the material would suggest it belonged to an amphora, but no comparable amphora rims of similar diameter could be identified. Rather, the diameter fits much better with that of a jug or flask (Hamarneh and Bianchi 2021: fig. 28, S_26030). The sherd has decorative grooves on the outside, and the orientation is similar to flask necks as well.

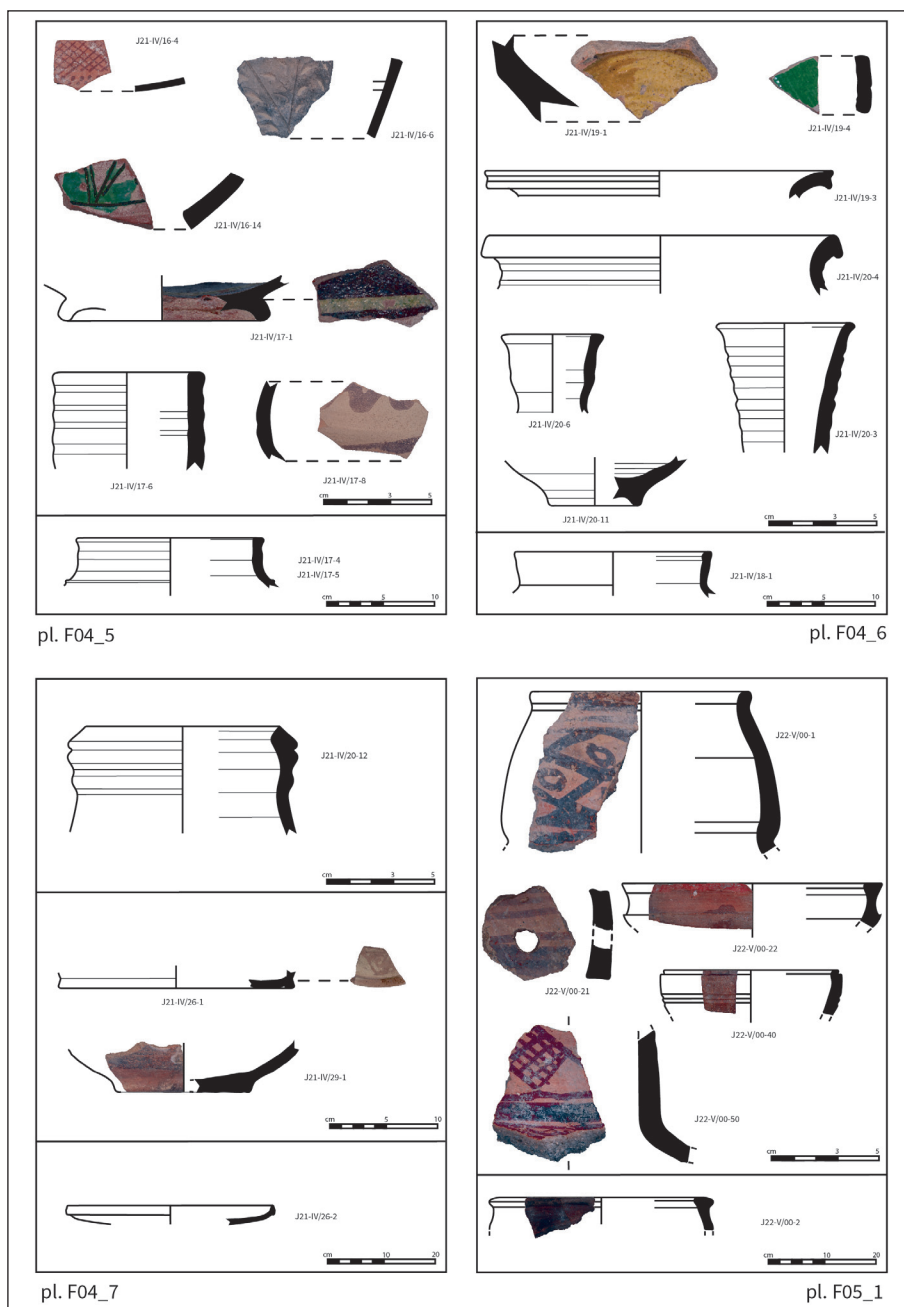
The wall fragment J21-IV/17-8 has no slip on the inside, but beige slip on the outside with brown lines and waves as decoration. The colouring can be compared to pieces from the Umayyad period dating around the 8th–9th century (Kareem 1999: fig. 7, sherd 9; Sanmori and Pappalardo 1997: 397, no. 3). Both comparable sherds are part of jugs, so this might be a possible vessel type for J21-IV/17-8, but nothing further can be said from the sherd alone.

SE F04_18 (Fig. 12 – pl. F04_6)

SE F04_18 yielded only one piece of diagnostic pottery, J21-IV/18-1, which belonged to a very well- worked and even amphora of high quality.

SE F04_19 (Fig. 12 – pl. F04_6)

The material from SE F04_19 dates to the later Byzantine and Abbasid periods and reflects storage vessels and tableware, respectively. The Byzantine pieces include J21-IV/19-3, a very well-fired storage vessel with fine walls and decorative grooves on the outside. The Abbasid tableware encompasses two glazed pieces. J21-IV/19-1 is yellow glazed with orange patches and shows a number of grooves on the inside as well as possible burn marks. J21-IV/19-4



12. Plates F04_5-7 and F05_1.

is green glazed with a darker outside. Similar pieces are well known from the early to middle Islamic period in Jarash (Peterson 2017: 70).

SE F04_20² (Fig. 12 – pl. F04_6-7)

SE F04_20 yielded a large array of very different sherds. Bowls, amphore, plates, and pots were found and their possible dating ranges from the 5th century to the 12th–13th century. These finds included Byzantine storage vessels and common-ware, such as a very well-worked fragment of a high-quality jar (J21-IV/20-3),

part of a well-worked medium-quality pot (J21-IV/20-4), a rim piece belonging to a finely worked flask with even wall thickness (J21-IV/20-6), and the partial base of a homogenous bowl with heavy traces of sinter (J21-IV/20-11), as well as a well-worked rim of an amphora. All these pieces show decorative grooves on the outside. Parallels are found regionally at Um er-Raṣāṣ (Pappalardo 2002; Sanmori and Pappalardo 1997) and Mount Nebo (Hamarneh and Bianchi 2021: fig. 6 S_20087, fig. 13 S_26249, S_26349, S_26355).

2. SE F04_20 is stratigraphically the same as SE F05_02.

SE F04_26³ (Fig. 12 – pl. F04_7)

This layer contained only six pottery sherds, which can be dated to the Byzantine and Ayyubid/Mamluk period. Only two sherds were diagnostic pieces.

The base J21-IV/26-2 has an unconventionally low foot. The decoration found on the inside, a red-brown semi-spiral on beige slip, and the colouring can be compared to Ayyubid/Mamluk-era decorative patterns (Khadija 1992, 346f., pl. II no. 40–44).

J21-IV/26-2 is a rim fragment of a plate with a diameter of 37 cm. There is residue of some sort of partial dark-grey covering, possible traces of burn, on the inside. Due to the form and fabric, it can be dated to the 6th century AD (Hamarneh and Bianchi 2021: fig. 23, S_25555).

SE F04_29⁴ (Fig. 12 – pl. F04_7)

SE F04_29 contained a large number of undiagnostic pottery sherds, mainly dating to the Mamluk period and overwhelmingly featuring cooking ware.

The only diagnostic piece is sherd J21-IV/29-1, the base of a bowl with a diameter of 10–12cm. The outside has a reddish fabric with black decorations that are rubbed down to some degree. This piece is comparable to J21-IV/08-4 (Khadija 1992: 345). Based on the fabric, it can be dated to the Ayyubid/Mamluk period (Peterson 2018: 131).

Pottery F_05

LSt, AW, RF, LP

SE F05_00 (Fig. 12 – pl. F05_1)

SE F05_00 yielded a large number of pottery shards, chronologically ranging from the Nabataean/Roman to the Islamic period. Of these, only a small number of pieces are diagnostic and either of Byzantine or Mamluk date. Most of the pottery can be assigned to the domestic sphere, tableware, and cooking ware, or also for economic use, for example, a *dolium* and a pottery loom weight.

The Mamluk jar J22-V/00-1 has a diameter of 10cm and is medium fired; it can be compared to pieces from Adh DHariḥ, such as DH 92 S4 C100-61 (Makowski 2020: fig. 6a). A significant

difference is that the criss-cross decoration on J22-V/00-1 features circles rather than dots.

This stratum also contained a loom weight, J22-V/00-21, of Mamluk production and displaying a reddish decoration on the outside. Fragment J22-V/00-22 is a Byzantine bowl of 12cm in diameter and well fired. A parallel can be found among the Byzantine bowls at Jarash (Watson 1989: 228). The Byzantine cooking pot J22-V/00-40 is well-fired and can be dated based on parallels found in Umm Qays (Gadara) (Daszkiewicz 2014: 152–153). J22-V/00-50 is a decorated, Mamluk-period wall fragment. The decoration features a diamond shape filled with a crisscross pattern and several lines of varying thickness, comparable to some samples found at KHirbat Adh DHariḥ (Makowski 2020: fig. 6d). A fragment of large Byzantine *dolium* with a diameter of 36cm, J22-V/00-2, was found.

SE F05_01 (Fig. 13 – pl. F05_2-3)

The chronological range of finds in SE F05_01 is quite broad, encompassing pieces from the Byzantine, Umayyad, Fatimid, and Mamluk periods. Many different forms such as tableware (plates and bowls) and cooking ware, were present.

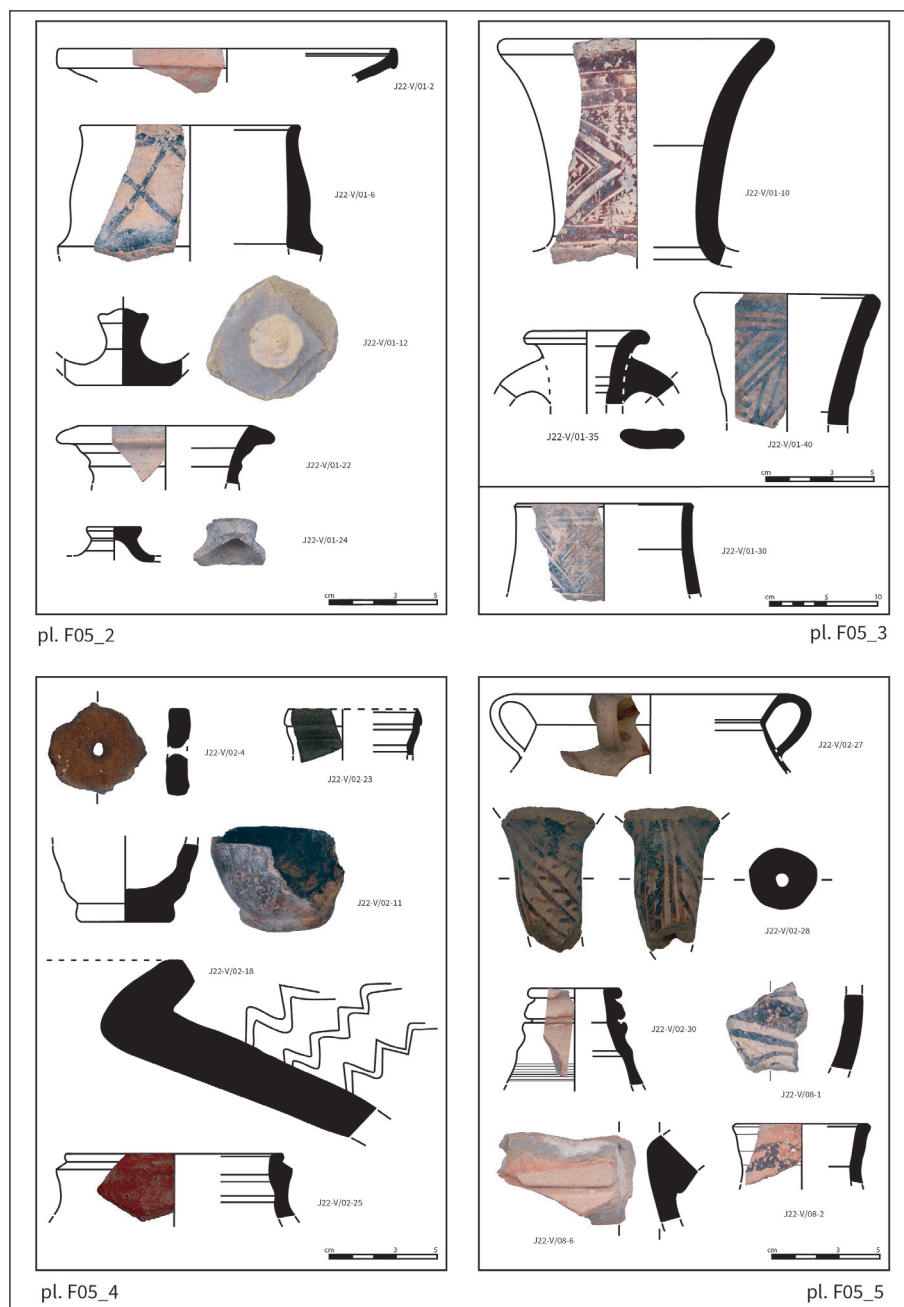
Several Byzantine pieces of different types constitute the first group. J22-V/01-2 is a rim of either of a plate or a bowl belonging to a common Byzantine type (Watson 1989: 225; Hamarneh and Bianchi, 2021: 103, 117). J22-V/01-12 and J22-V/01-24 are lids of Byzantine cooking casseroles. Both are well fired and measured about 4cm in diameter. Although only the handle of the lid is preserved, comparisons can be found in Jerusalem (Magness 1993: 215). An amphora, J22-V/01-22, with light orange fabric and small black and white inclusions, also finds parallels in the corpus of Byzantine pottery discovered in Jerusalem (Magness 1993).

A second group comprises rim sherds of Mamluk jars. Fragment J22-V/01-6 is decorated in a crisscross pattern (Makowski 2020: fig. 6b) similar to pieces from Jarash, such as J13-D-9-4, which shows an equally loose style of decoration (Peterson 2019: fig. 7.27).

The pieces J22-V/01-10, -30, -35 and -40 are parts of the neck of several jugs, displaying dark red to black geometric decoration and

3. (SE G04_26) is stratigraphically comparable to SE F05_08.

4. (SE F04_29) is the same layer as SE F05_25.



13. Plates F05_2-5.

traces of grey sinter. The fabrics are medium-fired with small- to medium-sized inclusions and some air bubbles. J22-V/01-35 preserves one handle. Especially the decorations of J22-V/01-10, -30 and -40 have similarities with a hand-made geometrically painted jug found in the north-western quarter of Jarash (Peterson 2021: fig. 20).

SE F05_02⁵ (Fig. 13 – pl. F05_4-5)

The diagnostic ceramics uncovered in SE F05-02) consist of thirty-six pieces. Among

these are four rims (J22-02/V-18, -23, -25, -30), one loom weight (J22-V/02-04), one handle (J22-V/02-27), one small cup (J22-V/02-11) and a part of a spout (J22-V/02-28). The rim J22-V/02-18 has an engraved wave decoration and can be dated to between the 6th and 8th century, similar to a jar from GHarandal (Arindela, Jordan) (Walmsley and Grey 2001: 8:21). The finds also included two pieces of Byzantine amphorettes, namely J22-V/02-23, which is of dark grey clay, and J22-V/02-25, of orange-reddish colour. A piece comparable to J22-V/02-23 was found at Mt. Nebo and

5. SE F05_02 is same as SE F04_20.

dated between the 6th and 7th centuries AD (Hamarneh and Bianchi 2021: S_20087), whereas J22-V/02-25 can be dated to between the 6th and 8th centuries AD, comparable to a jar found at Arindela (Walmsley and Grey 2001: 8:20). J22-V/02-30 is made of thick, light coloured-yellowish clay, well-fired, although without painted decoration; its clay was decorated with various protrusions, valleys, and ridges. A comparable find, a tall-necked jar from Arindela suggests a dating between the 6th and 8th centuries AD (Walmsley and Grey 2001: 8:17). J22-V/02-04 is a loom weight made of brown clay with white and black inclusions, it can be dated between the 10th and 12th centuries based on a similar example discovered at Jarash (Petersen 2017: 7.23). The last two pieces of the sample are unique: J22-V/02-11 is a small, nearly intact cup made of beige clay and displaying signs of soot on the outside and on the inside. As the cup is hand-made and has no significant decorations, it could be dated to any settlement period of the site. J22-V/02-28 is a spout comparable to a piece discovered at Khirbat Din'ila dating to the 14th–15th century (Stern 2014: fig. 4:10); made of thick, beige clay, it is decorated with geometric lines of dark brown colour.

SE F05-08⁶ (Fig. 13 – pl. F05_5)

SE F05-08 contained eight diagnostic pieces, chronologically ranging from the Byzantine to the Mamluk period. Two of these, J22-V/08-01, -02, are wall pieces, one of very light grey clay with small black inclusions (J22-V/08-01) and one of orange-reddish clay with small white inclusions (J22-V/08-02). Both are well-fired and show remains of geometric line-decoration. Both pieces find parallels in HMGP bowl fragments discovered at Jarash (Barfod *et al.* 2019: 11-15) and dated between the 13th and 14th centuries.

J22-V/08-03 is a handle made of light orange clay with a grey-brown core and small, light brown inclusions. The design and colour allow comparison to J22-V/02-30 and a similar dating between the 6th and 8th centuries AD (Walmsley and Grey 2001, 8:17).

SE F05_19 (Fig. 14 – pl. F05_7)

Of the sherds from SE F05_19, the pieces J22 -V/19-1 and -3 appear to be from the Abbasid period, whereas J22-V/19-2 can be dated to the Byzantine period. The Abbasid pieces are of dark red, rusty fabric, with very small white inclusions and well-fired. J22-19/V-1 also features a common decoration consisting of carved lines (Khalil and Kareem 2002: fig. 13-no. 9). Comparable pottery for both has been found at KHirbat Yājūz, dating between the 8th and 10th centuries (Khalil and Kareem, 2002: fig. 15-no. 13). The Byzantine sherd J22-V/19-2 resembles the lower part of a cooking pot with an *omphalos* base found at Dayr 'Ayn 'Abātah (Politis 2012: 186, fig. 398). With its grey fabric and the black traces of burn outside, it can be placed in the group of grey cooking pot ware (GCPW; Politis 2012: 179).

SE F0_25⁷ (Fig. 14 – pl. F05_7)

Supplementary to the pottery finds of SE F04_29, SE F05_25 included only one piece of pottery. J22-V/25-1 is the base of a jar made of orange-reddish fabric with small white inclusions and well fired. The outside of the piece, dated to the Byzantine period, is largely burnt and covered in some places by sinter.

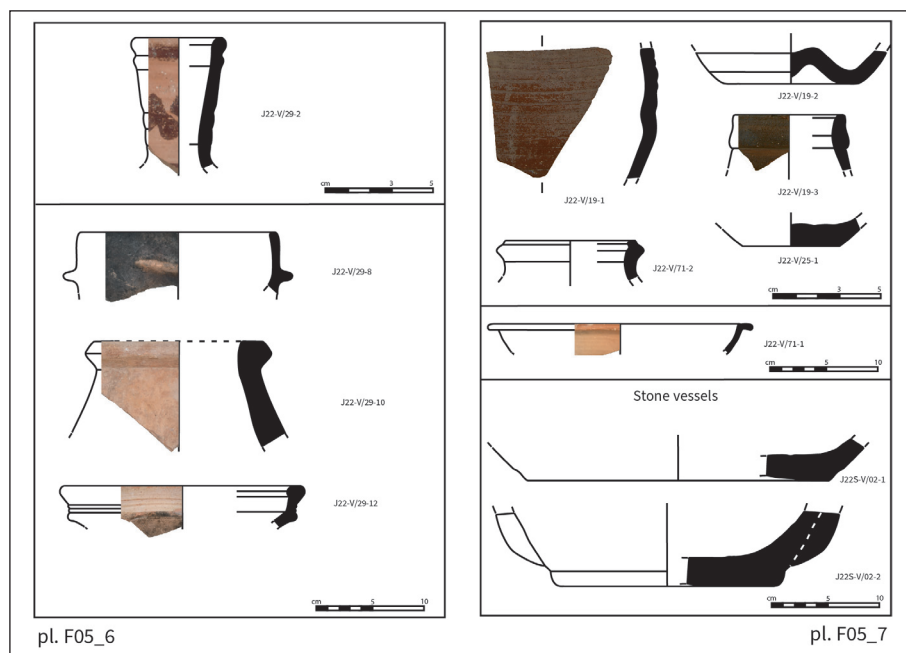
SE F05_29 (Fig. 14 – pl. F05_6)

SE F05_29 included several diagnostic pieces belonging to the Byzantine, Umayyad, Abbasid, and Fatimid periods. J22-V/29-10 is the rim of a Byzantine amphora of light pink clay and a slightly greyish core. The piece is very well-fired and has few small inclusions; parallels have been found at al-Burj al-Ahmar (Pringle 1986: fig. 44 – no. 15). The handmade cooking pot J22-V/29-8 is of pink clay with a black burnt surface on the outside. The piece has a small horseshoe-type handle and resembles pieces found at Adh DHarīh dating between the 10th and 12th centuries (Makowski 2020: 587, fig. 4).

The finds also included pieces of tableware, such as J22-V/29-2, a rim of an Abbasid juglet/jar, made of fine pink clay with small white inclusions. The outside is decorated by a dark red line under the rim, a red wavy decoration above the shoulder, and another line

6. SE F08 is stratigraphically the same as SE F04_26.

7. SE F05_25 is stratigraphically similar to SE F04_29.



14. Plates F05_6-7.

underneath the sharp ridge at the junction of the neck and body (see parallel in Khalil and Kareem 2002: fig. 15). The second tableware piece, J22-V/29-12, could possibly be the rim of a plate or bowl. It has traces of sinter on the outside and although there were no parallels of form or type, an analysis and comparison of the fabric suggest a dating in the Byzantine period.

SE F05_71 (Fig. 14 – pl. F05_7)

This layer contained pottery of the Nabataean/Roman and Byzantine periods, two of which are diagnostic. One is the rim of a plate (J22-V/71-1), the other the rim of an amphora (J22-V/71-2). Both pieces find parallels in Jarash and can be dated to Byzantine times (Watson 1989: 12, 225).

Small Finds

KS, ID

Domestic Objects

Zooarchaeological Finds

Concerning the zooarchaeological finds of the seasons 2021 and 2022, both excavations brought forth a broad spectrum of animal remains, including those belonging to various types of mammal such as goat/sheep, cattle, carnivores, mice, molluscs of land and marine origin, and avian species as well as pieces of horn and a presumed ostrich eggshell fragment. The total sum of fragments amounted to 665 pieces. The majority, 469 pieces, were

excavated during the earlier 2021 season, while the remaining 196 fragments, including the presumed eggshell fragment, were recovered in 2022. Further research and examination are needed to specify the various faunal species and possible traces of human activity, *e.g.* the presence of cut marks on the bone surface or the possible existence of human remains among the bone samples.

Glass

Various small glass shards with similar characteristics were found during both excavation campaigns. The most prominent feature is their colouring, which spans different hues of blue, green, turquoise, grey, and white. The glass material is of fine quality with only minor inclusion of air bubbles and a smooth surface, which in some cases is covered by a silvery, shimmering slip. Some of the 51 pieces can be identified by their common decorative forms of Byzantine glassware, *e.g.* wave-shaped fragments that find corresponding parallels in vessels with ornate handles or other decorative elements in a wave-shape and with a silvery shimmer on their surfaces (Rehren, 2008: 82, plate 4; Meyer 1988: 204).

Metal

A total of twenty-six metal finds were excavated during both campaigns. They encompassed a variety of pieces that due to

their state of preservation could only in part be classified. Nine metal pieces were uncovered during the excavations in 2021. These finds comprise materials such as iron and copper, most were heavily eroded and in a poor state of preservation. Nevertheless, three pieces were identifiable as a linked chain (SE, F04_01), a metal nail (SE F04_03), and a coin (SE F04_26). The jewellery piece consists of a linked pendant and a chain of the same material.

SE F04_04 yielded a nail with rust spots and other undefined metal pieces. The coin from SE F04_26 is heavily eroded, and as a first impression, it could be a Byzantine *nominal*, but further analysis is necessary.

The campaign in 2022 brought forth seventeen metal finds, including a possible small piece of silver from SE F05_02. Interestingly, three metal pieces were found in the conflagration layer SE F05_54, which lies over the mosaic.

Jewellery

In the 2021 season, seven jewellery pieces (J210055) were found in SE F04_16, including five bracelet fragments made of different metals, which need further analysis, and two pendants. A snail shell with a hole and a button-like form with a hole in the centre were also uncovered.

Loom Weights

In 2021, two loom weights were found: one piece (SE F04_8) consists of stone with a hole in the centre and is pyramidal in shape, and the second weight (SE F04_19) made of clay has a round form and two holes. Two further loom weights were excavated during the 2022 campaign in SE F05_00. One is made of clay (J22-V/00-21, **FIG.12** -pl. F05_1), and the other is a stone weighing around 1kg. These artefacts indicate textile production⁸.

Architectural Finds

Tesserae - Mosaic Stones

A great amount of loose mosaic tesserae was recovered from the site during both excavations. Most of these cubical stones, a total of 4121

pieces, were retrieved during the 2021 season, while the 2022 excavation brought forth 2285 pieces. The latter appeared in the archaeological context mainly in two different sizes, with primary measures of 1×1×1cm and secondary measures of 2×2×2cm. All pieces show natural earthen colouring spanning brown, black, grey, beige, and white, to a few reddish hues. Some small fragments were found stuck together with mortar in a typical mosaic layout, though some clustered fragments appeared in no apparent structure, indicating that these loose tesserae clumps may have been used in connection to the building of the church.

Industrial Finds

Slag

During the 2021 season, two slag pieces were found, including one lump (SE F04_01) with black and white inclusions defined as ceramic slag. The other one (SE F04_29) had visible rust traces on the surface, which indicates metal slag.

The excavation of 2022 unearthed only one lump of slag. The lack of magnetism shows that the piece is of ceramic origin. Further research would provide information on the composition of the slag pieces.

Various Small Finds – Stone Objects and Pipe Bowl Fragments

Another group of the small finds at Al Jumayl are various stone objects including fragments of basalt millstones and stone vessels (J22S-V/02-1, -2, fig. 13 – pl. F05_7), a polished stone sphere that might have been used as ammunition for a slingshot, two fragments of silex used for starting fire, and small pieces of presumed architectural ceramics. An especially interesting piece was found in SE F04_04 during the 2021 excavation; it appears to be a fragment of polished white stone broken into two aligning pieces with the numerals VXX carved into the surface. SE F04_08 revealed a fragment of a pipe bowl, black in colour and without special markings, presumed to be of Ottoman or later origin.

Season 2021 unearthed eleven basalt millstone fragments, while six basalt fragments used as millstones were recovered in the 2022 season, as were nine grindstones in SE F04_29.

8. Although the archaeological category of loom weights is in general rarely published, the Tall Al Mazār collection shows the development of loom weights from the Iron Age IIB to the Early Hellenistic period (Boertien 2012).

Digital Archaeology at Al Jumayl

TL

Beginning with the excavation campaigns of 2021 and 2022 at Al Jumayl, digital archaeological documentation approaches were introduced to the spatial recording process at the site. Three-dimensional documentation took place on three different levels survey, excavation, and finds—utilizing consumer grade photogrammetry and LiDAR technologies. (**Fig. 15**) At the survey level, a photogrammetric survey yielded a 3D surface model of KHirbat Al Jumayl's nucleus (23,783.4 m²), which in turn was used to create a digital elevation model (DEM), an orthographic map, and a precise ground plan of all superficially visible structures via geographic information system software (QGIS).

Also, utilizing the iPhone 13 Pro's LiDAR sensor, three-dimensional scans of some of the site's more accessible cisterns were produced, constituting a first assessment for potential further archaeological and hydrological research.

At the excavation level, structure from motion (SfM) photogrammetry was applied as the main spatial recording method at a multiple strata scale, ensuring a holistic and fast documentation experience. Measurements were almost exclusively taken digitally in-office by means of the previously created georeferenced 3D models. At the finds level, outstanding finds were 3D-documented, supplementing the traditional recording methods of photography and hand-drawing. The added third dimension rendered depictions and reconstructions of certain artefacts more intelligible.

Conclusion

BH

The two excavation seasons at Al Jumayl presented here have yielded many important results, which still need to be addressed in detail. So far, a detailed map of the most prominent features of the site has been prepared using non-invasive methods, which provides an understanding of the topography of the settlement for future investigations. The mapping of the cisterns also gave important insights into the typology of the water supply of the site. In addition, the study of the pottery showed that the structures of the investigated area were possibly abandoned in the Fatimid period with an important phase in the early Ayyubid-Mamluk periods, which is a very important contribution to our understanding of the area in the Islamic period. More specific questions related to living and consumption patterns and other aspects of daily life, in addition to the links with sites in the surrounding areas will be addressed in future campaigns.

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15. DEM, ground plan, and lidar scans of cisterns 12 and 5 (Plans By T. Leutgeb).

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THE 2023 AUSTRIAN AL JUMAYL PROJECT

PRELIMINARY REPORT¹

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Introduction

B. Hamarneh

From August 28 to September 27, 2023, the University of Vienna team conducted an archaeological campaign in Al Jumayl (Amman Governorate) with the goal of expanding the investigation of the church that had been partially excavated during the 2021 and 2022 campaigns. Excavating the north church to the fullest extent possible, locating the north exterior wall, and determining its relationship to the second parallel church to the south and the nearby north building complex were the main goals. Another major goal of the study was to comprehend the historical relationships between the two churches and how they have operated over time.

The excavation is a component of the research project “Rethinking Periphery in Late Antique Arabia”, which has the overarching aim to of understanding the village’s significance in the evolving topography of the Dioceses of Mādabā in the Byzantine and the early and late Islamic

periods. This includes the built environment, cultural artefacts, agriculture, water resources, land use, and economic networks. Layers of use, abandonment, and reuse were discovered during the double church complex excavations, which took place between 2019 and 2023. This ecclesiastical structure which develops on the lower terrace in the southern part of the settlement, comprises two single-nave adjacent buildings, dating back to the Byzantine period. The previous campaigns of 2021 and 2022 already uncovered the apse, presbyterium and a small part of the nave of the north church, with remarkably well-preserved walls and architectural remains such as pillars, pilasters, and arch stones. The church incorporates Roman-Nabataean spolia, partially plastered walls, and a polychrome mosaic floor. Furthermore, the village survey made it possible to record the existence of cisterns, caves, and a sizable stone quarry.

The Campaign of 2023

BH, TL, MLL

The Al Jumayl double church complex’s north nave excavation yielded important new information about the stages at which the settlements evolved in the Late Antique and Early Islamic eras. The new data clearly separate the settlement activity at Al Jumayl from that of nearby larger settlements such as Um er-Raṣās, and show a continuity into the Middle and Late Islamic periods that has not previously been demonstrated for the surrounding villages. Furthermore, work on

1. We would like to thank the Director General, Prof. Dr. Fadi Bal’awi, as well as the staff at the DoA for their invaluable assistance to the excavation team. We wish also to express our gratitude to Mr. Aktham Oweidi, the Director General’s Technical Assistant, Mr. Hussein Saleh from the Excavation and Survey management team, and Mr. Mohammad Saleh, and Mr. Yaser Hashem, who served as DoA representatives and provided us with scientific and logistical support. We are especially grateful to HE the Ambassador of Austria Mrs. Dr. Marieke Zimburg, and to the staff of the Austrian Embassy in Jordan for their unwavering support and interest in our work. We are grateful to Franco Sciorilli, and especially to the community of Al Jumayl for their kindness.

excavating the southern church complex's presbytery and apse has started. An initial evaluation of the church's conservation state and the anticipated stratigraphy was given by this work. The severely damaged southern nave will continue to be worked on during the upcoming campaign in 2024.

Two survey approaches were used to further the understanding of the architecture and infrastructure of the historic settlement. Firstly, the use of a photogrammetric drone survey provided detailed information on both the historic agricultural use of the surrounding area and the visible peripheral settlement features above the present ground level. Using the DoA's drone equipment, an area of approximately 10ha could be photogrammetrically surveyed. Combining this spatial dataset with the pre-existing layout of the core settlement (see Hamarneh and Leutgeb 2023), the first comprehensive map of Al Jumayl was produced. It consists of stone-built structures such as the tower, various buildings, boundary stones, walls dividing plots of land walls along *wadi* channels and dams, and rock-cut features such as cisterns and cave dwellings.

Second, consumer-grade LiDAR (iPhone 13 Pro) was used to survey most of the accessible sub-surface features identified by orthophotography in the area of interest. As a result, the condition of preservation of 16 out of 46 partially operational cisterns and 15 out of 21 only recently deserted cave dwellings were recorded.

Stratigraphy and Utilization Phases of the North Church

TL, MLL

Three excavation campaigns have been carried out in the double church complex since 2021. The interior of the north church (F04 and F05) was excavated down to the mosaic floor. In addition, a long trench (F06) was dug in 2023 to expose the presbytery and apse of the southern church.

Due to the different levels of exposure over the centuries, the two structures in the complex have very different levels of structural and archaeological integrity. The heavily disturbed southern church (F06, apse and presbytery) has not yet been fully excavated, although some phases have been identified.

The documentation of the north church (F04 and F05, presbytery and nave), with its well-preserved archaeological layers, allowed a preliminary subdivision into seven main phases of use and events.

Recent

The upper layers of debris SE F05_00 and SE F05_01 contained modern finds of plastic and aluminum and therefore seemed to be recent layers. In addition, an extensive looting hole SE F04_11 broke through all the archaeological layers in the easternmost part of the apse.

Mamluk/Ottoman

At some point in the Mamluk/Ottoman period, according to the pottery finds, a dry-stone wall was built on top of the collapsed church to create a living space inside the apse. The debris inside the apse was covered with a limestone floor. A doorway to the south is also indicated by a doorway hinge and threshold.

Collapse (Fig. 1)

Dating the collapse of the churches is a difficult task. Indeed, it is not even certain whether the collapse occurred all at once or over a longer period of time. The latest pottery sherds in the debris layers SE F05_02 and SE F05_76, which cover all the structural vault collapses, are of Mamluk origin. At the very least, the sequence of the collapses seems clear from the stratigraphic position of the fallen roof slabs and vault stones. Arches 2 and 4 collapsed first. The stone roof slabs fell at the same time and slid under still standing arches 1, 3 and 5. They then collapsed onto the stone roof slabs.

Abandonment after Fire

A widespread layer of charcoal and ash (SE F05_90), covering almost the entire nave, indicates a severe fire. The few Byzantine pottery sherds recovered are of no help in dating the event from a stratigraphic point of view. Charcoal samples have been taken but have not yet been analysed.

Abandonment/Erosion

Below the burnt layer, stone chips and fragments of lime mortar (SE F05_91) were identified over the excavated area.

The thickness of this layer increased considerably in close proximity to the church walls, effectively creating a concave shape. This may correspond to a period of wall surface erosion and probable abandonment of the building.

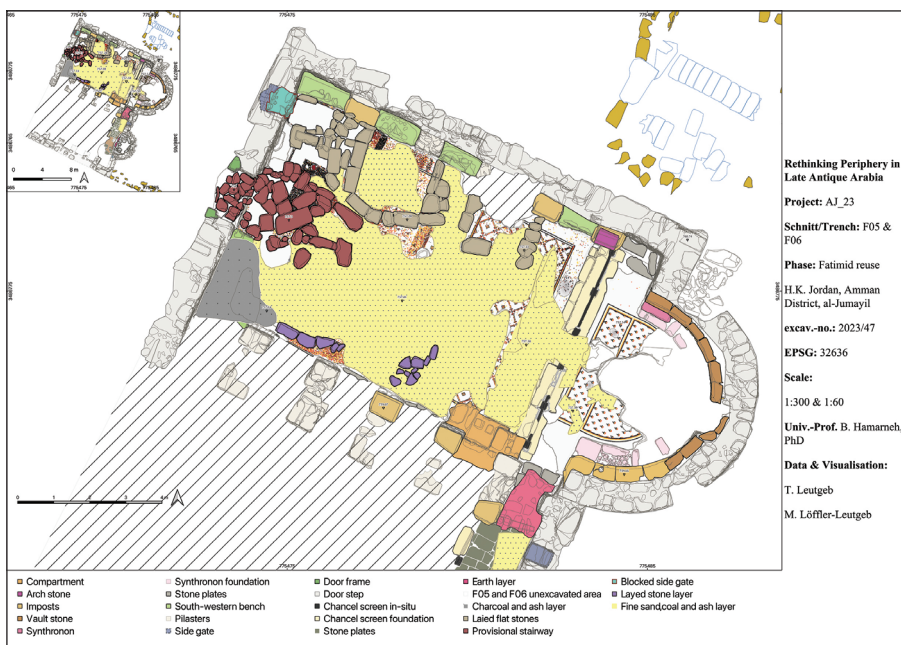
Fatimid/Abbasid Reuse (Fig. 2)

Covered by the erosion layer (SE F05_91), with a loosely laid stone structure. A dry-stone partition wall, organized in two superimposed rows, was used to block the side door in the west wall and the intercolumnar space between

the first pilaster and the east wall of the church. A temporary 1m high stone stairway/ramp from the central western entrance of the building led down to a flat walking level covered with a layer of fine sand, ash and charcoal (SE F05_92). Two single-layer structures of flat stone were set in a rectangular pattern against the north wall of the church. One of the structures contained a stone slab with a scratched crucifix. However, the scratched surface was facing downwards. Animal remains and fragments of a basalt millstone suggest a domestic re-use of the church building, possibly as a living space,



1. F05 plan of the collapsed arches.



2. F05 plan of the Fatimid/Abbasid re-use phase.

shelter and/or animal pen. Pottery sherds found in layer SE F05_92 are dated to the Byzantine, Fatimid and Abbasid periods.

Byzantine Use (Fig. 3)

The original layout of the nave seems to have undergone only one major mosaic alteration and some minor structural rearrangements. Nevertheless, three phases of use of the church can be distinguished.

The original layout of the nave is formed by the western, northern and eastern walls and the southern row of pillars. The northern pilasters and benches (SE F05_84, 86, 88), the chancel screen foundation, the *synthronon*, the stone paving and the stone thresholds in the intercolumnar areas were installed before the original mosaic floor (SE F05_57) was laid. This original mosaic is still intact to the east and west of the foundations of the chancel screen. At least one of the stone benches (SE F05_112) on the west wall was built directly on this mosaic floor. The original mosaic borders are partly covered by later plaster.

The mosaic floor in the western part appears to have been restored at a later date. Instead of the earlier design, large areas of black and red mosaic tesserae fill large areas. This mosaic frame follows architectural elements such as the previously applied wall plaster and the western stone bench.

In front of the south-west bench (SE F05_111) a footrest made of squared stones and mortar was built over the later mosaic.

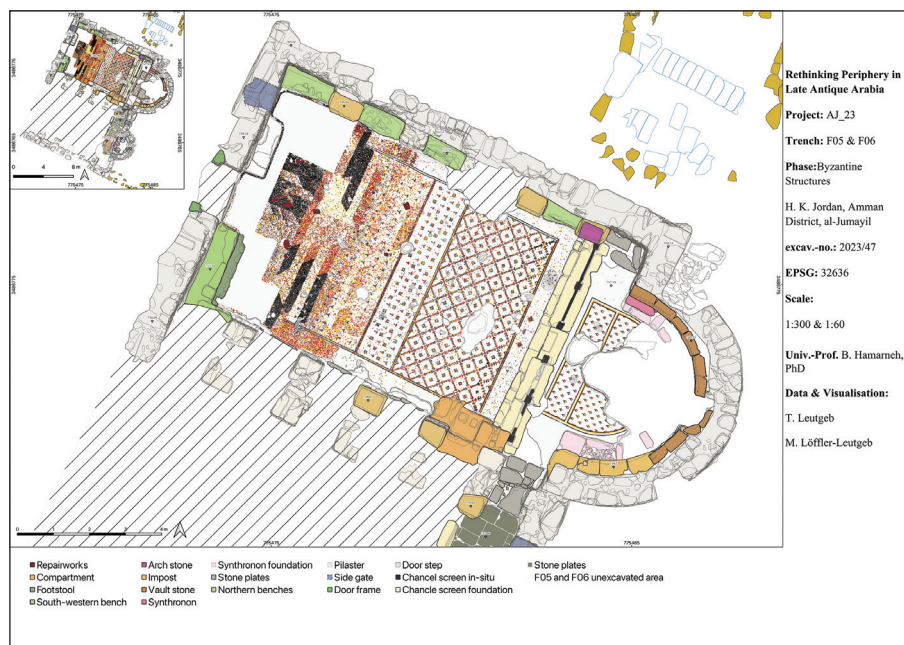
Architecture of the Church

MLL, LS

The church complex is about 258 square meters in size and is oriented axially east-west. Two adjacent churches make up the complex. Two doors are located in the western wall of the north church, while a 1935 photo by Savignac shows at least one other door in the south structure. The complex is integrated into a massive boundary wall to its south, while two apses of different size define the eastern side.

The church's northern outer wall is shared with another building complex; further research is needed to determine the precise structural relationship between these two complexes. The church's exterior walls are composed of well-dressed ashlar that come in a variety of sizes and shapes. The stones are meticulously interlocked at the corner sections. The church complex's two adjacent naves measure the same 7.9m in width and 11.2m in length. Five rows of double pillars divide the two naves. Five rows of pillars are also visible on the opposing faces of the northern and southern walls.

The main architectural features discovered during the 2021 and 2022 campaigns, such as niches, pillars, and pilasters, have already been



3. Plan of the original Byzantine church layout.

discussed in ADAJ 61 and 62. Benches and a single footrest were found during the recent excavation in the nave of the north church. Three of those benches were discovered in their original locations, each positioned in between the northern wall's pillars (2A–5A). They are directly in contact with the wall and the pillars, and are all plastered (SE F05_84, 86, 88). The substructure is composed of rubble stones (SE F05_125) and the plaster coating consists of three different layers. A white bottom layer with coarse inclusions is, topped by a second coarse layer with greyish-brown colour. The top layer is of smooth white plaster, with minimal inclusions. The three benches situated amidst the pillars seem to have been integrated into the church's construction.

Another bench (SE F05_112) is located in the southwest corner of the nave and features a footrest (SE F05_111). The latter is composed of rounded-edged, flat, rectangular stones that have been slightly worked. There are pieces of plaster still in place on the footrest and the bench. Although the mosaic encircles the edges of the bench (SE F05_112), which suggests that it is part of the original construction, it appears that the footrest was positioned above the mosaic floor at a later date.

The Mosaic (Fig. 4)

BH

After removing the later stone structures, and the last abandonment layers (SE F05_92, 98, and 99), the floor mosaic (SE F05_56) was fully exposed. Parts of this pavement had already been excavated in 2021 and 2022. The mosaic, which is entirely non-iconic, was made in different stages.

Due to the decorative style, the sections encompassing the presbyterium and the eastern portion of the nave (SE F05_56, up to roughly the middle) belong to the Byzantine period phase, probably to the last decade of the 6th century AD. This phase is distinguished by a geometric pattern composed of florets arranged diagonally. Such a pattern is well documented in the context of religious Christian buildings in the area. The closest parallels are the presbyterium of the church of Bishop Sergius, and the first phase of the church of St. Stephen both at Um er-Raṣāṣ (Piccirillo 1991: 333; Piccirillo

1993), but it also appears at Mādabā, KHirbat Al Mukhayyāt and Mount Nebo (Piccirillo 1993). From the middle to the western outer wall, the western section of the nave is covered in a mosaic that was probably altered later most probably in the 8th century AD (SE F05_157). Along the western wall, between the two doors (SE F05_120 and SE F05_155), small remnants of an earlier white tesserae paving are still preserved.

The last pattern in proximity of the west wall featured a design of red and black stripes with flowers around them. The coloured tesserae were arranged to conceal any remnants of the previous décor. This is a rare instance in the history of iconophobic floor changes in the area of Mādabā. The full remake of a mosaic floor is certainly uncommon, one of the best documented cases being that of the church of the Theotokos in Mādabā (Piccirillo 1993).

A number of small to medium-sized holes (IF² F05_100–104, 107, 108, 110, 121–123, 133–136, 138, 144–149, 153, 154, and 156) as well as some repair work, filled up with tesserae, pottery, and worked stones (SE F05_105, 106, 109, 129–132, 137, 139, 143, and 152) can be seen throughout the entire area. The pavement substructure SE F05_141 and the mortar bed for the tesserae, SE F05_140, are visible due to the depth of IF F05_100 (medium sized breakthrough). This damage can be assigned either to the collapse of the heavy roof's or as signs of wear and tear; none seems to have been intentionally inflicted.

Chancel Barriers (Fig. 5)

LS

During this season, some pieces of worked oil shale were discovered in both the F05 and F06 trenches. Trench F05 held a few of these pieces that are possibly part of the original church's channel barriers. Six fragments (J23S-V/91-02) that are part of a larger piece were discovered in SE F05_91. Twenty more tiny pieces of a stone plate made of oil shale were found in SE F05_92 (J23S-V/92-02). These are unadorned fragments of a barrier, marginally less fragmented than the pieces from (J23S-V/91-02). Despite their preservation status, the pieces all have comparable widths and exhibit surface smoothing as signs of processing.

2. IF = Interface.

Within the southern church's apse and presbytery (F06), two different elements of chancel screens was found. The fragments of (J23S-VI/06-01) were situated in a secondary context, arranged in the presbytery pavement; decorated side facing upwards, while the second element, (J23S-VI/06-02) was found outside

the north corner of the apse, also used as part of the pavement decorated side facing down. The second fragment was only partially decorated and was not finished. (J23S-VI/06-01) is decorated with a *cross pattée* inside a circle.

This motif can be seen throughout the region, as for example in chancel screens at the church of



4. Mosaic of the northern church nave.

the Lions in Um er-Raṣāṣ (Piccirillo 2003: 298, fig. 9; Michel 2001). Rather than using oil shale, the panels could instead be made of marble. (Piccirillo 1992: 205-208: fig. 5). The banded circle around the cross could be a simplified depiction of a wreath. This wreath is visible in a lot of other compared panels, coming, for example, from *Palaestina Prima* and *Tertia* and probably dating earlier than the panels from Al Jumayl and Um er-Raṣāṣ. One example with a wreath instead of a banded circle is in the Monastery of the Lady Mary in Baysan (Bet She'an) or in 'Awjat Al Ḥafīr (Nessana) from the north church (Habas: 2000 124-125, fig. 67 and 68).

The Pottery of F05 (Fig. 6)

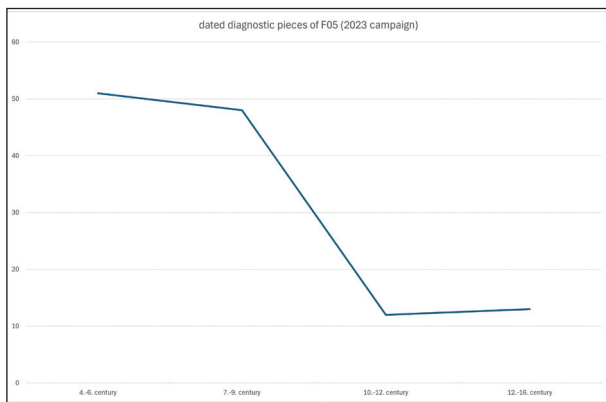
BH, FM, MLL

The 2023 excavation campaign yielded a substantial number of finds, particularly pottery sherds, despite the fact that the total quantity of sherds recovered was considerably less than in the two preceding campaigns. It was noted that certain strata had significantly more discoveries than others, similar to what was observed in the earlier excavation campaigns.

Since the most recent surface layers in



5. Drawings of the chancel barriers.



6. Pottery statistic of F05 of the 2023 campaign.

section F05 had already been removed in the 2022 campaign, the Mamluk period was already represented in the first stratigraphic units uncovered in the 2023 work. Here, SE F05_02 was one of the most important layers, yielding a total of 64 sherds. Of these, about one-third could be dated; most were from the Mamluk, Byzantine, and Abbasid periods. Additionally, SE F05_76 dates to the Mamluk period. Of the 31 sherds that were gathered, seven were dated: two were Mamluk and five were Byzantine.

The first burnt layer, SE F05_90, which contained late Roman and Byzantine sherds, came after the Mamluk utilization level. A layer of chalk and mortar (SE F05_91) followed by one of yellow earth and sand (SE F05_92), which produced 120 and 73 sherds, respectively, followed this first burnt stratum. Byzantine, Umayyad, Abbasid, and Late Roman eras make up the vast bulk of these. Additionally, one Fatimid sherd from SE F05_91 is present. Conversely, SE F05_94, 97, 98, and 111 have comparatively few sherds in each, making them relatively poor in finds. The ones that could be chronologically dated were from the Umayyad and Byzantine periods. 33 Thirty-three sherds found in a further burnt layer (SE F05_99) can be dated to the Nabatean, Byzantine, Umayyad, and Abbasid periods.

SE F05_02 (Fig. 7)

KK

(SE_F05_02) contained a total of 25 diagnostic pottery pieces that can be dated from Roman-Byzantine times into the Mamluk period. Shown in (Fig. 2) are three diagnostic pieces that reflect different types of storage vessels.

(J23-V/02-03) is essentially a grey-black core bowl base that has not fully fired. The exterior features burnt patches and traces of sinter, with a colour ranging from orange to light brown. Brownish beige with noticeable orange and white particles can be seen inside the bowl. Open storage vessels of this type were extremely common. The light -orange material used to make these bowls is bare and unglazed. Similar Mamluk wares made from orange-brown clay have identified in other excavations in Historic Palestine (Avisar and Stern: 2005, fig. 4, 5).

(J23-V/02-06), the second sherd in this selection, is Mamluk period in date. This

bowl's rim piece has a moderate level of firing. The interior is light beige with a faint hint of yellow, while the exterior is a creamy tan with dark brown wave-like patterns. Additionally distinctive to the interior are reddish-brown geometric decorations in the form of flat semi-spirals. Rujm Al Kursī and Tall Ar Rās are also known to have similar geometric motives (Stern 1999: fig. 52; Khadija 1990: fig. 29).

The last piece from SE F05_02 is a thick rim piece (J23-V/02-17) from an amphora. The dating can be set in the Late Byzantine or early Umayyad period. The piece was well fired and consists of rather rough, coarse ware. Its outside colour is brownish and shows indications of fire

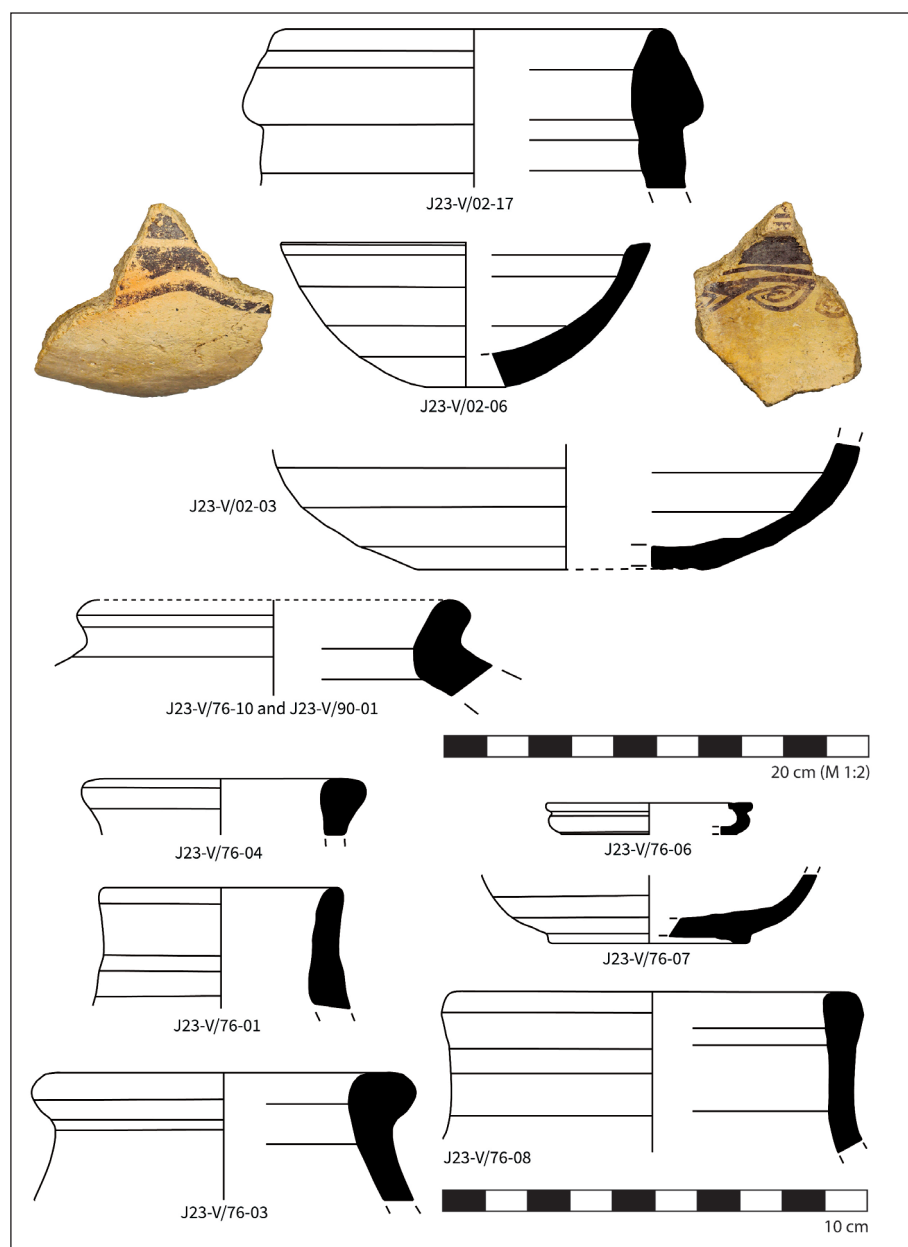
exposure. Parallel vessels from this period can be found in the “Tabula Ansata” Church at Um er-Raṣāṣ (Piccirillo 2003: 310, fig. 18, 322, fig. 30) or in the finds in the northwestern parts of the Shefala in Historic Palestine (De Vincenz 2015: fig. 5.2.5, 5.2.6).

SE F05_76 (Fig. 7)

AA

The finds of SE F05_76 allowed the identification of ten ceramic fragments that can be dated to the Roman, Byzantine, Ayyubid, and Mamluk periods.

Among the selection of this stratum is (J23-V/76-01), identified as a rim fragment



7. Pottery fragments of SE F05-02+76.

from a ceramic bowl that has orange-brown colour with darker, burnt spots. The interior of this fragment presents a smooth surface and is medium-well fired. The piece is assigned to the Roman-Byzantine period. Comparisons can be found in Um er-Raṣās at the “Tabula Ansata” Church (Piccirillo 2003: 312, fig. 20, 316, fig. 24) as well as in the Tyropoeon Valley Jerusalem (De Vincenz 2020: fig. 3.8:11).

(J23-V/76-06 and -08) are rim pieces of amphorae from the Byzantine period, both medium to well fired. J23-V/76-06 displays a smooth grey surface, light sinter, grey edges, and a lighter core. In contrast, J23-V/76-08 shows a greyish-brown surface with a rough texture, along with pale beige edges and core. Comparable pieces can be found at Mount Nebo and Um er-Raṣās (Hamarneh and Bianchi 2021: S_30015; Alliata 1992: 411, fig. 19).

The plate fragment (J23-V/76-07) is a base. It is well-fired, exhibiting a pale orange colour with noticeable light sinter inclusions and minor grey specks. It is possibly an imitation of African Red Slip Ware (Dark 2001: fig. 51, A, B).

(J23-V/76-10) (and J23-V/90-01), is the rim of a dolium, dating to the Late Roman or Byzantine period. The exterior is characterized by a pale orange colour with dark sinter and a rough texture. It has been medium fired, and its interior features a pale to medium orange shade with visible white and grey inclusions, along with a rough texture. Comparable vessels dating to the middle Byzantine period can be found close by at Um er-Raṣās and throughout the whole Mediterranean area (Pappalardo 2006: 392, fig. 2; Alliata 1992: 235, fig. 7.1; Lafli and Sahin 2015: fig. 14.119; De Vincenz 2015: fig. 5.3.17).

The fragment (J23-V/76-03), a further rim section of a ceramic bowl, showcases a thick, pale beige finish with a smooth exterior, and can be classified as “pale ware”. Comparable pieces such as this can be found at Um er-Raṣās (Piccirillo 2003: 313, fig. 21). The form, thickness, and colour of this rim also resemble fragments found in southwestern Paphlagonia (Lafli and Sahin 2015: fig. 3.41). The dating of these samples falls within the late 8th to early 9th Century AD.

Noteworthy is (J23-V/76-04), which is part

of either a bowl or a cooking pot from the Ayyubid-Mamluk period. This grey sherd is well fired, featuring a smooth external glazed surface contrasted by a rougher glazed interior with small, perceptible inclusions. The glazing consists of a dark green base, with dark red to black patches, probably resulting from the use of the vessel. A comparable rim from a cooking pot has been discovered in Historic Palestine at Tall Ar Rās (Stern 1999: fig. 38).

SE F05_90 (Fig. 8)

KK

Three Roman and Byzantine diagnostic pieces were found in SE F05_90. (J23-V/90-01) dates to the Late Roman or Byzantine period and is a thick rim piece of a dolium. The piece fits together with (J23-V/76-10). The form and thickness of the dolium rim resembles “hole mouth jars” and regional parallels can be found in Um er-Raṣās and Historic Palestine (Pappalardo 2006: 392, fig. 2; Alliata 1992: 235; De Vincenz 2015: fig. 5.3.17).

(J23-V/90-03), the second piece from this stratum, is the base of a shallow Byzantine-style bowl. This piece has dark patches all over it due to the sherd’s granular orange-brown exterior which is covered by large, burned areas. There are no remaining signs of glazing, but there are signs of light sinter and a rough surface. The interior side still has some fibre markings, grey sinter, and a brown and orange coloration. This piece appears to have been either African Red Slip Ware (Dark 2001: fig. 51.E), Phoenician Red Slip Ware (De Vincenz 2015 Fig. 5.5.7, 5.14.4), or an imitation of one of those due to its discoloration from fire exposure and its granular component.

SE F05_91 (Figs. 8 – 10)

SG, KG, MS, CW

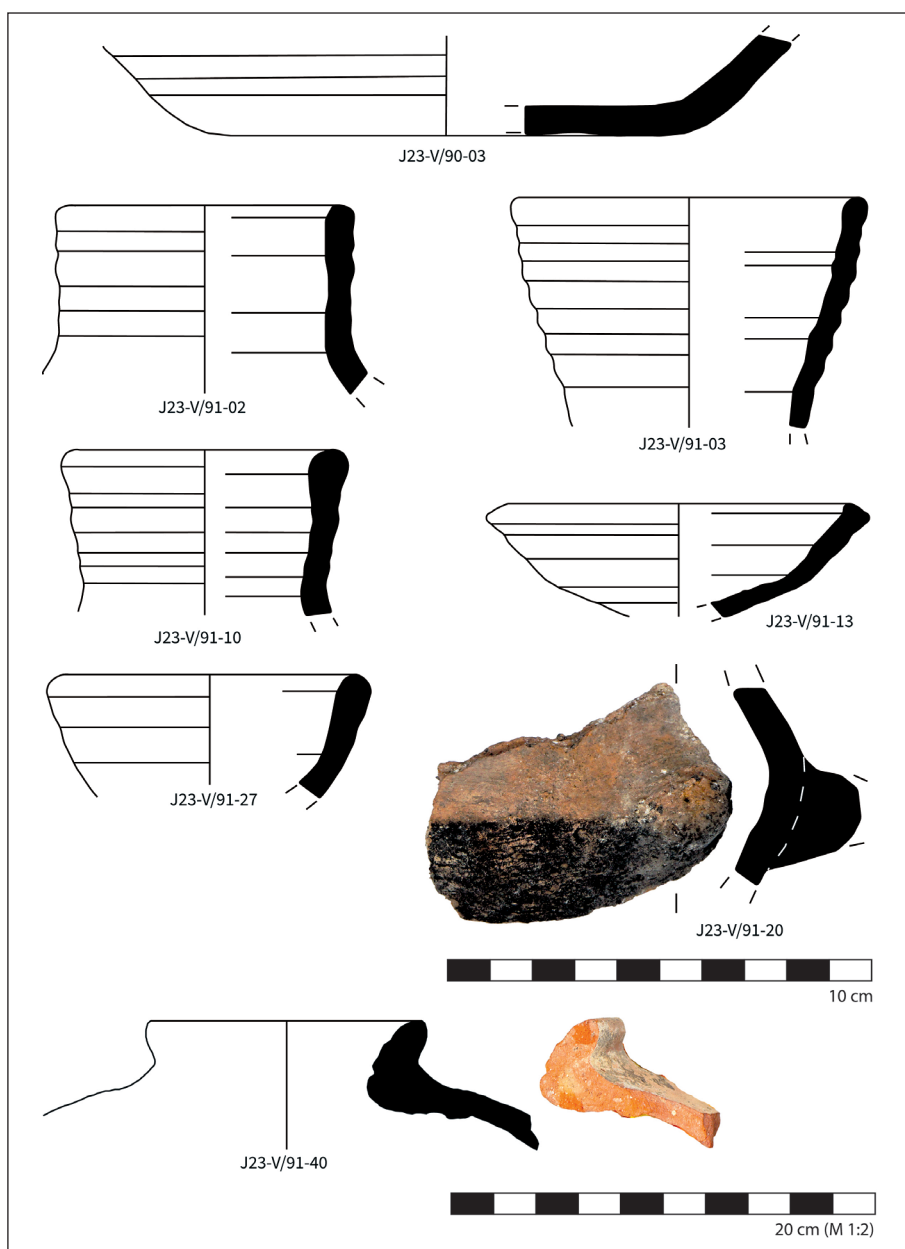
In SE F05_91, 44 diagnostic and 75 non-diagnostic pottery pieces have been discovered. While the bulk of these artefacts are Byzantine in origin, some also date to the Roman, Umayyad, Abbasid, and Fatimid periods. Most of the pottery is classified as table and cooking ware, while some pieces are classified as commercial ware and feature a range of plates, jars, and cooking pots. (J23-V/91-40) is a rim of a Roman dolium with a rough surface

on both sides and only small inclusions: its colour is orange in the core and there is a pale orange coat on the outside of the storage jar. On the inside of the dolium shallow imprints of fingers are preserved (Pappalardo 2006: 392, fig. 2; Alliata 1992: 235; Lafli and Sahin 2015: fig. 14.119; De Vincenz 2015: fig. 5.3.17). Sherds (J23-V/91-02) and (J23-V/91-10) do not fit together but display the same material, thickness, and decoration. Both are medium fired and have a dark grey core with pale edges, showing small inclusions. The rough surface of the outside displays a dark grey colour with patches of a light orange undercoat covered with light sinter. The horizontally running

parallel-line decoration of elevations and depressions along the outside, can be seen on Byzantine flasks or jars. Comparisons of this decoration are wide spread and can be found at the Reliquary Church and the “Tabula Ansata” Church at Um er-Raṣās (Pappalardo 2006: 392, fig. 2, Piccirillo 2003: 312, fig. 20; Armstrong 1993: 323, 324, fig. 16.274, 16.275).

(J23-V/91-03) is a well fired rim made of pale orange clay with small white inclusions, covered in light sinter. The outside is decorated with horizontally parallel running lines like (J23-V/91-02/10).

The outside is further characterized by a rough surface, while the interior of the sherd



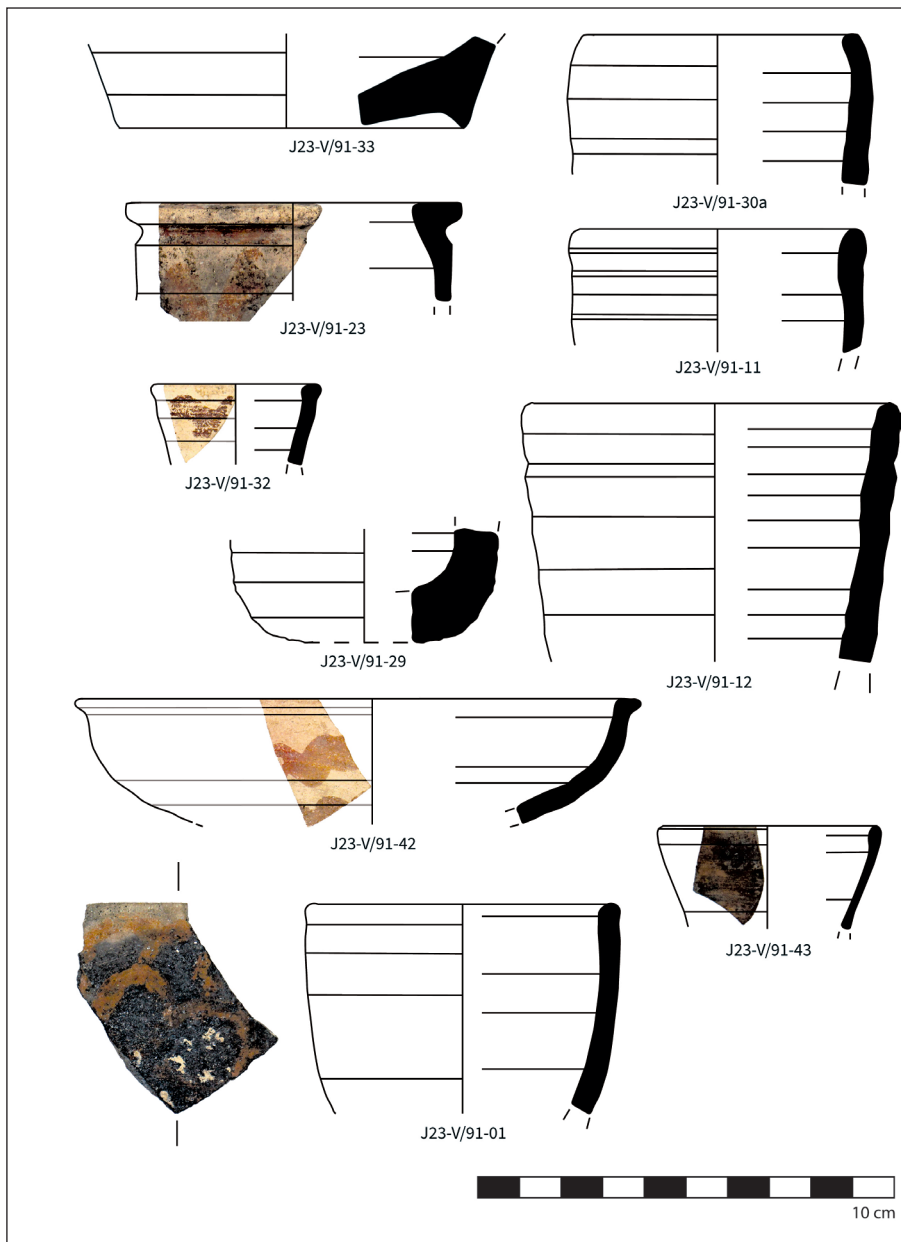
8. Pottery fragments of SE F05-90+91.

is smoothed. similar pieces can be found from the Byzantine (Catling 1972: 9, 13, fig. 5.169) and early Umayyad periods (Niamir 1999: 47-49, fig. 4.5 Boas 1992: 160, 161, fig. 74.7). Parallels, dating to this transformation period can also be found in Um er-Rasās (Piccirillo 2003: 319, fig. 27).

Several fragments of Byzantine cooking pots and one lid were found in SE 91, among them the rim pieces (J23-V/91-13) (lid rim) and (J23-V/91-27) (rim) and a wall fragment with handle (J23-V/91-20). The clay of (J23-V/91-13) is of a grey colour, showing black patches and traces of sinter outside and inside. On the outside additional parallel lines can be

noticed. The material is well burnt and displays small white to greyish inclusions. Parallels are known for example from the Reliquary Church (Pappalardo 2006, 393, fig. 3) Meanwhile (J23-V/91-20) and (J23-V/91-27) are made of orange clay with pale edges and a darker core, both are not well fired and show traces of black patches on the outside.

(J23-V/91-20) shows light inclusions and a few medium-sized air bubbles. The rough exterior surface displays light sinter and a large burnt area: the orange interior surface is smooth with light inclusions. Parallels for the cooking pot with handle can be found at the “Tabula Ansata” Church and at Nitil (Piccirillo 2003:



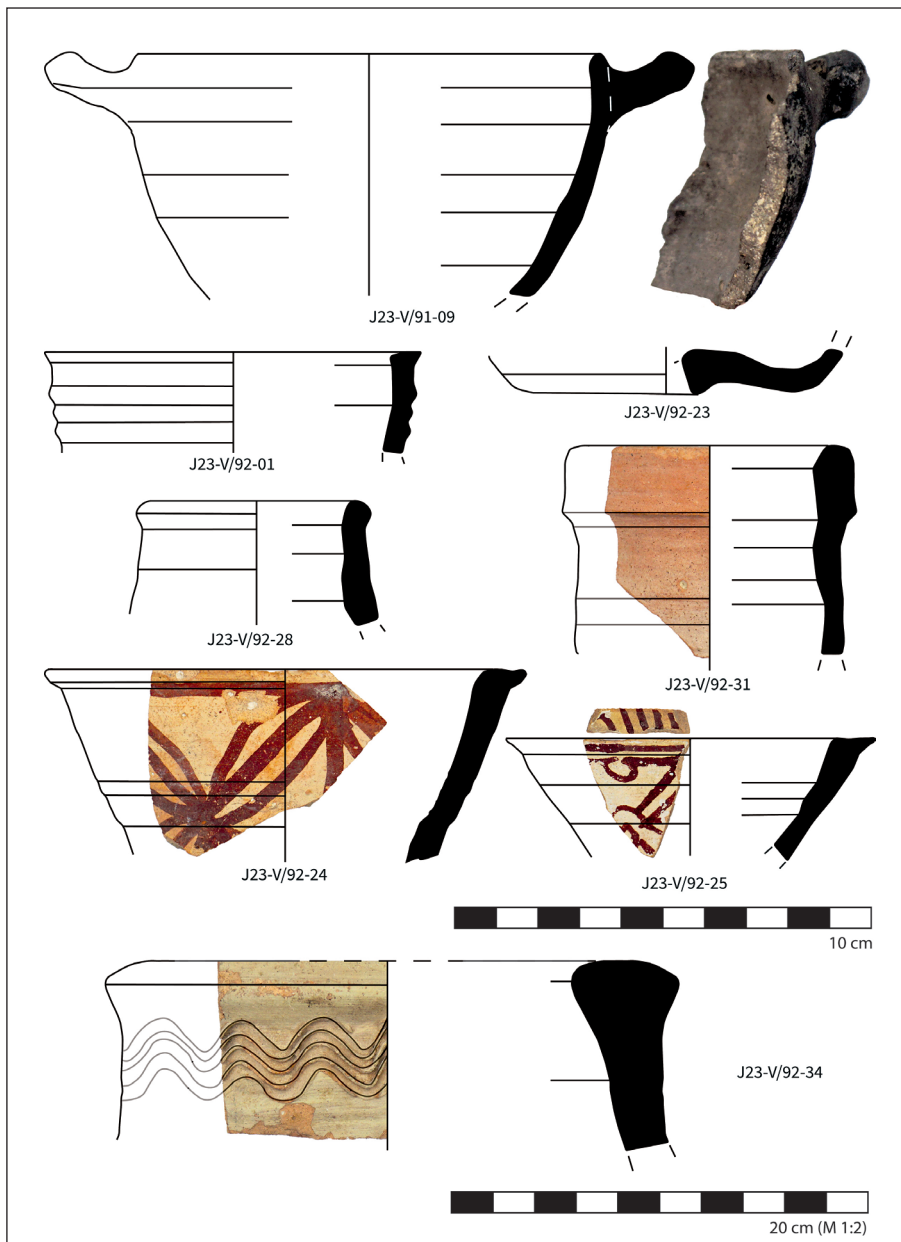
9. Pottery fragments of SE F05-91.

310, fig. 18, Hamarneh 2006, 441, fig. 15). J23-V/91-27 is also of low quality, showing larger inclusions of other material and air. Pieces similar to this have been found at the south court of the Saint Paul Church at Um er-Raṣās (Pappalardo 2002: 434, fig. 36).

Two possible further pieces of cooking ware dating back to Byzantine time and featuring with burnt areas on the exterior, are (J23-V/91-33) possibly used as a cooking pot due to its form, and (J23-V/91-30a). Both have a dark greyish-brown colour, while the cooking pot has an orange core and a second that is entirely greyish all over and has a smoother surface (J23-V/91-30a). Parallels can be found at the south court

of St Paul's church and the "Tabula Ansata" church both at Um er-Raṣās (Pappalardo 2002: 422, fig. 27; Piccirillo: 314, fig. 22).

(J23-V/91-23) is the rim of a hemispherical bowl dating to the Byzantine to Umayyad period. Parallels to this piece can be seen in pottery of Um er-Raṣās and Jarash (Alliata 1992: 233, fig. 5; Pappalardo 2002: 432, fig. 34; Parker 2022: 81, fig. 4.20; Walker 2012: 513, fig. 4.2, 14). While displaying grey sinter, its beige-brown, smooth outside shows traces of reddish slip. The equally smooth inside might have been burnt; the surface is beige and includes dark sinter. The well-fired clay has greyish-beige edges and a darker core without



10. Pottery fragments of SE F05-91+92.

containing any inclusions.

The rim of a bowl, (J23-V/91-11), is identical inside and out; it has smooth surfaces of a creamy beige colour with small brown and grey inclusions and is well fired. Similarities can be found in other storage vessels, from the region dating to the Byzantine to Abbasid period (Piccirillo 2003: 306, fig. 15, 308, fig. 16;) including and from *Hisbān* (Walker 2012: 533-535, fig. 4.10:21).

(J23-V/91-32) is a well fired rim fragment. Both the edges and the core are beige: small white inclusions are visible. The inside of the sherd has a smooth, pale beige colour: parallel lines and tiny grey inclusions are visible. The outside has a smooth surface and pale beige colour as well, and an irregular, wave-shaped dark brown/reddish painted pattern is partly visible. The upper part of the pattern follows a regular wavy line, but the lower part differs. The dating can be placed between the Umayyad and Abbasid periods (Pappalardo 2002: 410, fig. 18, 434, fig. 36; Daviau and Beckmann 1994: fig. 3.12., (Fig. 4.6).

A further piece dating to the Abbasid period is (J23-V/91-12), a well fired rim piece that, displays orange edges and a greyish core with light and dark inclusions. Pronounced sinter and orange markings, possibly traces of glazing, can be seen on the smooth, pale beige exterior. Comparisons from the Abbasid period can be found at *Um er-Raṣās* and *Al Muwaqqar* (Piccirillo 2003: 310, fig. 18; Najjar 1989: 317, fig. 9.34).

The two sherds, (J23-V/91-29 and J23-V/91-42), can be dated to Abbasid period, one of them being a fragment of an open drinking vessel (J23-V/91-29, *Alliata* 1992: 245, fig.12). The clay is pale beige on the outer and inner side, with a rough surface and many inclusions. The second piece belongs to the rim of a wide, open vessel, possibly a bowl (J23-V/91-42). The surface is smooth with an orange and light-grey base and reddish-brown wavy lines on the outside. The core is of similar beige colour, has few inclusions, and is well fired. (Piccirillo 2003: 131, fig. 21; Pappalardo 2002: 411, fig. 19; Hamarneh 2006: 446, fig. 17)

The first Fatimid sherd of this sample is (J23-V/91-01), the rim of a small bowl or jug. The material is internally and externally grey,

with small inclusions and some burnt patches on the outside. Along the rim, the piece has red markings, that resemble fish scales and are drawn in a dark red-brownish colour. Pieces with similar decoration dating to the Abbasid Fatimid period are, for example, found at *Tall Hisbān* (Walker 2012: 542, 544, fig. 4.13:14).

(J23-V/91-09) is a medium-fired rim and handle of a Fatimid hemispherical bowl with a large opening. It is made out of grey clay, the edges being darker than the core and containing tiny air bubbles. The outside is smooth to the touch and slightly burnt, whereas the inside shows a few burnt patches with visible inclusions. A parallel in form can be found in a Fatimid casserole at *Hisbān* (Walker 2012: 542, 545, fig. 4.13:30).

The last sherd is a rim of a vessel (J23-V/91-43). The outside is dark grey with black-brownish patches and a smooth surface. The inside is similarly dark as well, as is the core of the clay, with no visible inclusions. well-fired it can be dated to Fatimid times.

SE 92 (Fig. 10)

SG

The yellow earth -and- sand layer, SE F05_92, contained 34 pieces of diagnostic pottery, dating from the Late Roman-Byzantine to the Abbasid period.

Piece (J23-V/92-01) is the rim of an open storage vessel or bowl. The core is grey with light inclusions, the edges are brown, and the sherd is well fired. Both the outside and the inside are of a greyish brown colour with light sinter and small light inclusions. There are textured horizontal parallel lines on the outside of the vessel. The sherd can be dated to the Byzantine period and parallels can be found throughout the region (Pappalardo 2006: 393, fig. 3; Vincenz 2020: fig. 3.14.8).

(J23-V/92-23) is a well -fired base piece. The outer edge is dark grey, the inner edge is light grey, and there are small light inclusions visible. Both the outside and the inside have as bluish grey surface with dark reddish sinter or residue. The piece seems to be the bottom part of a jug or juglet and can be dated to the Byzantine period. A similar vessel can be for example found at *Tall Mādabā* (Foran 2022: 86, fig. 3).

(J23-V/92-28) is a rim of a cooking pot. The inner edge is black, the outer is grey beige with light inclusions and tiny air bubbles, and the piece is medium fired. Both the outside and inside of the sherd have a colour with a brownish beige undertone, and display burnt patches on the surface. The piece can be dated to the Late Roman or Byzantine period (for parallels see: Piccirillo 2003: 319, fig. 27; Vincenz 2020: fig.16.18).

The (J23-V/92-31) is a rim piece of an amphora. The edges are pale, the core is dark beige: tiny air bubbles and tiny grey and white inclusions are visible. The sherd is well fired. The surface of the outside is smooth, pale orange in colour with light sinter and visible grey and white inclusions. The piece is dated to the Late Roman/Early Byzantine period (Pappalardo 2006: 393, fig. 3; Piccirillo 2003: 306, fig. 15, 322, fig. 30; Foran 2022: Fig. 3.2., 3.3).

The rim (J23-V/92-24) pertains to an open storage vessel. The edges are pale, the core is dark beige with medium- sized air bubbles; and small white to grey inclusions. The piece is very well fired. The inside has also a smooth, surface and a pale beige colour: tiny inclusions are visible as well. The outside has a smooth pale beige surface with a dark brown-reddish floral- pattern painted decoration. The pattern shows the upper and right sides of a square with the remains of a four-petalled flower. The petals are formed by three lines each. The sherd shows stylistic similarities to a piece published by Alan Walmsley (Walmsley 2022: fig. 121; Haron and Clark 2022: fig 122), which suggests a date between the 9th and 10th centuries, either the Abbasid or early Fatimid period.

The sherd (J23-V/92-25) is also a rim piece of a large open storage vessel. The piece is medium fired, the edges are pale, the core is orange, and grey and white inclusions are visible. The inside is smooth with traces of sinter: tiny inclusions are visible. The external surface is smooth, and pale beige in colour . Below the rim are two horizontal lines, the lower one interrupted by a semicircle extending inwards. This piece finds parallels in the pottery published by Walmsley (see Walmsley 2022: fig. 122; Haron and Clark 2022: fig 122), allowing the piece to be dated between the 9th and 10th centuries, similar to (J23-V/92-24 and J23-V/99-09). Parallels from

the region can be found at several places such as Um er-Raṣās and Nitil (Hamarnah 2006: 437-446, fig. 12-16; Piccirillo 2003: 313-319, fig. 21-27; Pappalardo 2002: 413, fig. 20; Alliata 1992, 239, fig. 9).

(J23-V/92-34) is a rim of a well-fired open storage vessel. The core of the piece is dark beige: the edges are orange with light inclusions. The inside is pale orange with light sinter, small grey and white inclusions are visible, and the surface is smooth. The outside is cream beige with grey and brown inclusions: on the smooth surface, four textured wavy lines are visible underneath each other. The dating can be placed in the late 7th/8th century AD to the Umayyad or Abbasid period, based on a comparative example (Piccirillo 2003: 308, fig. 16, Sanmori and Pappalardo 1997: fig. 12; Walmsley 2022: fig. 35.).

SE FE05_98 (Fig. 11)

AA

One diagnostic fragment was recovered from stratum SE F05_98: a rim of a cooking pot, (**J23-V/98-01**), dating to the Roman - Byzantine period. The piece is heavily burnt on the inside and outside, having a dark grey-black core. The material is rough, with medium sized inclusions. It shows evidence of exposure to fire on its roughly textured exterior and lighter sinter, while the inner surface, is smoother. This fragment is characterized by its black edges and core, and it has undergone medium firing. The form of this cooking vessel is comparable to the Byzantine table ware found in Kadmeia (Armstrong 1980: fig. 16.274).

SE F05_99 (Fig. 11)

KK

In SE F05_99 ten diagnostic fragments (most of them Byzantine house and cooking wares, but also Nabatean and Abbasid fine ware) were found

The first piece in the sample shown here is, (J23-V/99-08), a Nabatean plate. This sherd was part of a rather large plate or shallow bowl with a slightly outturned rim. The inside is orange and decorated with a slightly darker motive of uneven parallel lines. Nabatean shallow plates and dishes with out-turned rims and mainly reddish slip that sometimes turns into a darker

red have been, found in Petra (Schmid 1995: fig 1.5-1.7).

(J23-V/99-03) is a rim piece of a Byzantine cooking vessel, with burned patches. It is medium-well fired, and the rim is an irregular wave-like form. Similar sherds of dark grey domestic wares are comparable to miscellaneous coarse vessel fragments and a casserole from the middle Byzantine period can be found throughout the region (for example Piccirillo 2003: 319, fig. 27; Pappalardo 2002: 427, fig. 30)

Sherd (J23-V/99-09) can be dated to the Abbasid period and is also a rim sherd of fine ceramic ware. The external side of this fine bowl sherd is characterized by a light cream colour and dark reddish brown painted decorations. The geometric motive features rhomboid line fields with a smaller notched rhomboid form in the centre and a triangular form above it with a curved hook formation in the middle. The rim itself is painted as well, and has an auburn single-wave motive. A bowl from Rujm Al Kursi shows comparable triangular painted designs on a light cream vessel (Haron and Clark 2022, fig 122). The piece also shows similarities to (J23-V/92-24 and J23-V/92-25) (Hamarneh 2006: 437-446, fig. 12-16; Piccirillo 2003: 313-

319, fig. 21-27; Pappalardo 2002: 413, fig. 20; Alliata 1992, 239: fig. 9).

Small Finds from the North Church

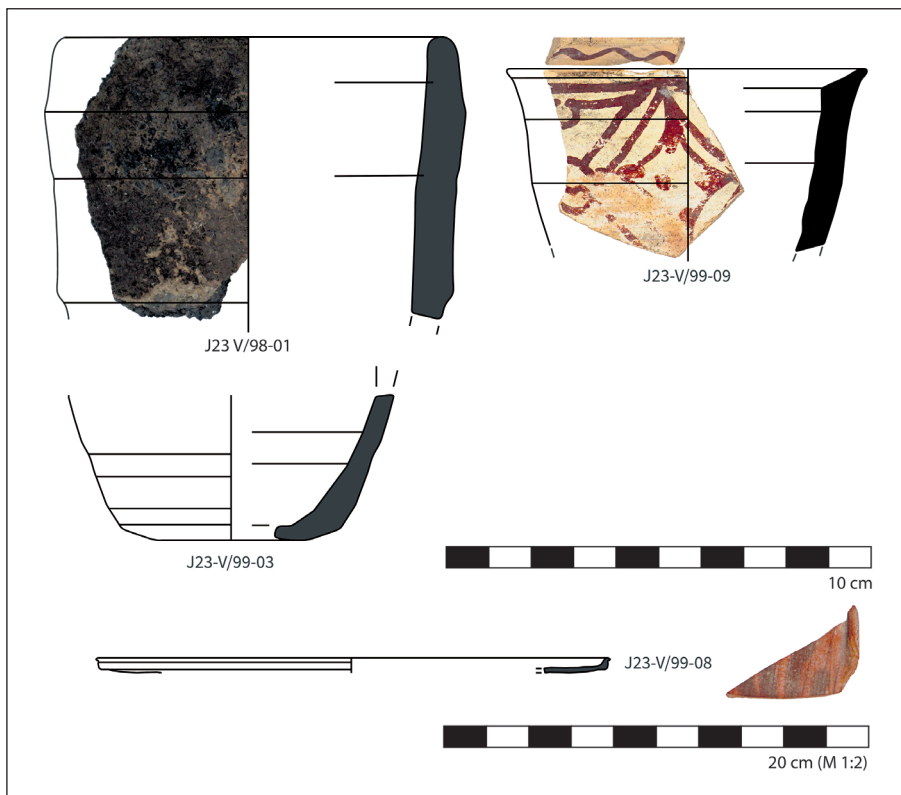
AA, SG, KG, ID, KK, MS, CW

Throughout the campaign several other finds of different categories could be unearthed, documented and partly dated. They offer further insight into the utilization phases of the church throughout time.

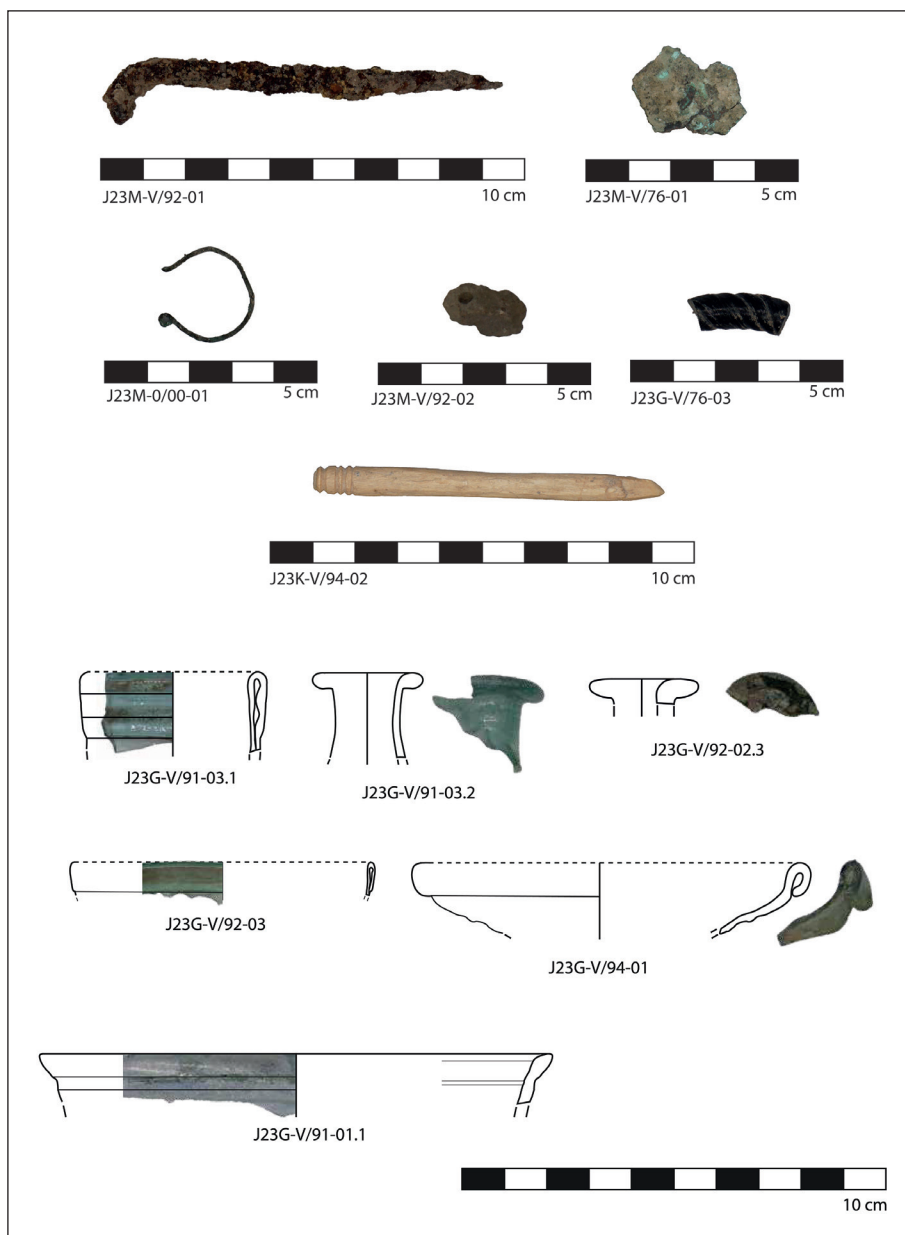
Archaeozoological Finds and Bone Pin/Tool (Fig. 12)

KS

A wide variety of faunal remains were discovered in the 2023 season, including the remains of goats, sheep, and other types of mammals, as well as cattle, mice, and domesticated dogs. Furthermore, about 20% of the total species count can be attributed to avians such as pheasants and fowl. The most common type is the chicken (*Gallus domesticus*), followed by Phasianidae: common quail (*Coturnix coturnix*) and/or the more locally plausible sand partridge (*Ammoperdix heyi*), as well as molluscs of both terrestrial and oceanic origin, are included in the recovered finds. There are about 414 fragments in all,



11. Pottery fragments of SE F05-98+99.



12. Small finds of various materials.

with the most common types appearing to be the osteological remains of the long bones of the legs, several fragments of the scapulae, different spinal vertebrae, and well preserved mandibulae of sheep or goat. Cut marks and burned patches are much more frequently found throughout the various sets of samples, in contrast to the findings from the previous two seasons. Throughout the Late Antique and Early Islamic periods, the quantity of large, assumed cattle bones decreases, which may be a sign of decreased consumption during this time due to a shift in dietary preference.

Out of all the osteological finds, a peculiar object stands out. (J23K-V/94-02), found in

stratum SE F05_94, in the western most corner of the church, near the entry, is a small piece of worked bone. It is assumed to be of domestic private origin due to its possible function, as well as its clearly worked and used shape. The fragment measures 8cm in length and roughly 0.5cm in diameter, and is broken in its lower part. The shape can be described as cylindrical in general, but, both the ends and the central part of the fragment lessen slightly in diameter. The central depression on the bone object and its general highly smoothed surface were most likely caused by regular and intense usage and handling. There is no visible trace of pigmented decoration. Besides all this, the upper part is

visibly marked with 5 grooves of different width in an irregular order. The lower end of the object appears in a conical shape. Possible interpretations of the object are usage as a hair pin, as a stylus for writing and carving, or as a textile-working needle or spindle. Hair pins of bones have been found at Um er-Raṣāṣ as grave goods (Pappalardo 2006: tavv. 16, Foto 3; Alliata 1992: 381, fig. 9), although this object is more rejuvenating towards the tip. Due to its size and the carved grooves and ridges along the upper end, an interpretation as textile spindle seems more plausible. The closest parallel was found at Tall Ḥisbān (Platt and Ray Jr.: fig. 11.1 and 11.2).

Metal Finds (Fig. 12)

ID

A combined total of around six metal nails and fragments were discovered in the excavation (SE F05_76, 91, 92, 99, 114). The nails show significant corrosion, suggesting the presence of iron due to rust discoloration. Their sizes vary, ranging from 2×4 cm to the largest measuring 8×0,5 cm. (J23M-V/92-01) a nail with a curved

head has equivalents in Um er-Raṣāṣ and Tall Ḥisbān (Alliata 1992: 231, fig. 4.2; Ray 1995: 154 pl. 10.2; McDaniel 2006). Additionally, there is a single indeterminate metal fragment (J23M-V/76-01) which appears to be copper, as indicated by the presence of a greenish patina.

Jewelry (Fig. 12)

The extremely simple bronze earring (J23M-00-01) is a surface find: it has a simple loop ending with a hook. Such Byzantine earrings have been found in funerary contexts (see Pappalardo 2006: 397, fig. 6; Platt 2009: 268, fig. 13).

A small stone pendant (1×2cm) with a loop-hole (J23M-V/92-02) and light grey coloration was found. A similar item was found at the Reliquary Church at Um er-Raṣāṣ (Pappalardo 2006: 397, fig. 6). J23G-V/76-03 is a fragment of a twisted glass bracelet (measuring 2.5×0.7cm) similar bracelets are dated to the Umayyad period (Platt 2009: 284, fig. 13).

Millstone and Grindstone (Fig. 13)

ID

Twenty-four basalt millstone fragments were found during the campaign. They vary in size, and indicate that activities such as crushing or grinding cereal crops were among the common activities in the village (McDaniel 2006). The millstone fragments were found in secondary deposit contexts.

Two types of querns have been identified: animal-operated (Type 002) and rotary hand-operated (Type 003), crafted from vesicular basalt (following the classification of Parton 2013, 303).

(J23S-V/02-01 and J23S-V/92-03), are cone-shaped *metae*. The flat, wide lower rubbing stone, is conical in shape towards the top middle, as can be seen in examples from Tall Ḥisbān (Kotter and Ray 2009: 116, 117, 120, fig. 9.3, 9.4, 9.8). The surface is rough, and the dimensions are 3,5-6×5,5cm (J23S-V/02-01) and 15×14×12cm (J23S-V/92-03). The lower cone part (J23S-V/92-03) fits perfectly into the upper piece, (J23S-V/99-01).

(J23S-V/99-01) is a Type 003, wheel-shaped grindstone, that measures 34,5×12×4cm. Parallels of complete mills and wheel-shaped grind stones can also be seen at Tall Ḥisbān



13. Stone objects.

(Kotter and Ray 2009: 114, fig. 9.1). The grindstone (J23S-VI/06-02) was found within the backfill of a looting hole and retrieved from the southern section of the apse (F06), beneath the floor level. It measures 38,5×28×9-19cm in size (Kotter and Ray 2009: 115, fig. 9.2).

Glass Finds - Vessel Fragments (Fig. 12)

KS

Several fragments of Byzantine and Early Islamic glass of various vessel types have been uncovered. Most fragments appear in the shape of outwardly curved rims, slightly curved bottoms and rotund neck fragments. The vessels that can be reconstructed seem to be either small glass lamps or similar vessels used as illumination devices, or alabastron like flasks. The most prominent feature besides their shape is their colour which includes a broad span of hues: blue, green, turquoise, grey and white. The glass material is of fine quality with a smooth surface and only minor inclusion of air bubbles.

Additionally, there is a range of several sizes of small glass handles, mostly belonging to glass lamps, that was uncovered in church. Similar vessels have been identified in several churches of Um er-Raṣāṣ (see Alliata 1991: 370, 398, 401 413; Alliata 1992: 231)

Reliquary (Fig. 13)

BH, LP

Among the interesting finds in the south-eastern corner next to the apse (SE F06_06), is a large sunken reliquary base (J23S-VI/13-01). The reliquary was originally inserted into the floor; its rectangular cavity featured a recess that most likely allowed for the installation of a lid. It also displays a tiny, shallow channel that may have been used to add or remove liquids. The stone was most likely used in the church presbyterium and was taken out when the building was looted; however, this issue needs to be addressed when the church is completely excavated. The stone served also as an altar base as can be deduced from the side recess's small rectangular fields, which would have served as seatings for small columns that supported an altar table.

Similar sunken reliquaries were identified in local context either in the Bema, as in the Reliquary church of Um er-Raṣāṣ dated to 586

(Piccirillo 2006: 381), or in small side chapels, as at the small church built near the so-called Stylite Tower possibly dated to the third decade of the 6th century. Similar reliquaries *in situ* were found in the North Church of Ḥisbān and at the Church of St. Basil at Rihāb (Piccirillo 1981: 70–72, tav. 55; Pappalardo 2006: Foto 14; Bianchi 2022: 57, fig. 128).

The Chancel Screen Mouldings (Fig. 13)

LS

Both trenches contained several more pieces of worked stone, most likely from the screens' frame, in addition to the panels and fragments of the chancel screens. Four fragments (J23S-V/92-04, J23S-V/94-01) were discovered in trench F05 and are made of a stone different from that used for the chancel screen panels themselves. One of those pieces (J23S-V/94-01) is composed of two fitting fragments has a column-like appearance and is made of white marble. It is composed of a slightly broader part, a carved line, and a shaft. The dimensions (roughly 13×7,5–13×6,2cm) might indicate a divider used between the chancel screen panels. As was customary, there were little, frequently square, posts positioned between the slabs of the chancel screen's slabs (Habas 2009: 101; Michel 2001).

Carved Stone (Fig. 13)

LP, LS

A square stone basin (J23S-V/91-03) with a small drainage hole in one of its corners was uncovered. This limestone piece is fractured at the centre suggesting that most likely it belonged to a larger basin. It was found reused upside down in a delimitation wall inside the church as part of the secondary use of the sacred building as a domestic space in the late 9th -10th century. A similar basin was identified at Um er-Raṣāṣ in the area of the church of St. Paul (Piccirillo 2002).

Conclusion

BH

The Al Jumayl church complex is a remarkable building when both architecture and liturgy are taking into account. It blends in well with the array of twin churches that were constructed in various rural and urban

centres of Provincia Arabia in the long Late Antiquity. A number of examples can be given in this context, such as the two neighbouring churches of Nitil (the closest example having one single nave) and the twin churches of Umer-Rasās inside the castrum enclosure, which have comparable architectural settings.

Nonetheless, as dating inscriptions and dedications demonstrate, adjacent buildings may have different functions, such as liturgical, funerary, or memorial. However, more research is still required to fully understand this aspect in our specific situation.

Numerous noteworthy discoveries from the excavation of the North Church of Al Jumayl have been made, some of which have already been documented from the earlier campaigns in 2021 and 2022. These discoveries help to further document the various stages of the building's use.

Up until now, non-invasive techniques have been used to create a thorough map of the site's most notable features. Drones have also been used to refine this map, covering a much larger area and improving our understanding of the settlement's topography for upcoming research. Mapping the production forms and water supply and management is made possible by the LiDAR mapping of the cisterns, the cave dwellings, the quarry, and two winepress facilities.

Furthermore, the examination of the ceramics supports the earlier findings from the excavation in 2022, emphasizing that the buildings in the North Church under investigation were most likely not abandoned until the Fatimid period. The discovery of rich archaeo-zoological material with various animal bones, primarily those of sheep, goats, and small birds in the abandonment layer is noteworthy. Several bones showed obvious cuts and butcher marks. This information confirms meat processing, animal husbandry, breeding practices and especially dietary habits. It also suggests that the church may have served as a deposit for catering waste, which is a strong hint that a semi-nomadic community may have used the building for near-permanent purposes.

The monument's long history is demonstrated by the discoveries, which include pieces of oil-shale chancel screens, tegulae, fine calk plaster,

tesserae, fragments of a basalt millstone, and pottery from the Byzantine, Abbasid, and Fatimid periods. The buildings' secondary use enhances our comprehension of the settlement patterns during the Islamic period, even though the building's religious function was not continuous. Further research projects will concentrate on more specific questions about agricultural use, crop production and harvesting, material and geoarchaeological analysis, and the village's integration into the larger setting of neighbouring settlements.

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TEN YEARS OF EXCAVATION AT THE EARLY NEOLITHIC SITE OF KHURAYSĀN (AZ ZARQĀ', JORDAN)

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Abstract

KHuraysān is an Early Neolithic site located in Az Zarqā', Jordan. The site has been excavated by a Spanish team since 2014. Several occupation levels, between 9000 and 6800 cal BC, have been documented. In the oldest level, corresponding to the end of the Pre-Pottery Neolithic A (PPNA), small subterranean oval huts were constructed. Around 8800 BC, the first signs of transition towards the PPNB are observed, with the presence of bipolar knapping, larger projectile points, and constructions with straight walls and right angles. Between 8500 and 8200 cal BC, in the Early PPNB, rectangular houses, which are adjacent to one another, with rounded corners were built with floors covered with lime mortar. Around 8200 cal BC, at the beginning of the Middle PPNB, houses were constructed with rectangular morphology, and the floors were covered with lime plaster. Throughout this sequence, an intensification in goat exploitation is observed, likely linked to their domestication, while pulses were consumed regularly.

Keywords

KHuraysān, Neolithic, Architecture, Agriculture, Livestock, Jordan

Introduction

KHuraysān (or Kharaysin, as it was named by the Australian team that discovered it) is situated in the municipality of Al Qunayyah, Az Zarqā' Governorate (32°12'25.08"N, 35°59'38.28"E), on the banks of the Az Zarqā' River, 40 kilometres north of 'Ammān (Fig. 1).

The archaeological site was discovered in

1984 by J.W. Hanbury-Tenison and his team during surveys conducted in the Jarash region and was attributed to the Pre-Pottery Neolithic B period (Hanbury-Tenison 1986; Edwards and Thorpe 1986). In 1989, Juan Fernández-Tresguerres conducted a sounding in the upper part of the site, just north of the road connecting Jarash and Az Zarqā', uncovering a Pottery Neolithic level superimposed on a Pre-Pottery Neolithic level. In 2014, another Spanish team initiated excavations at the site (Ibáñez *et al.* 2021), with ten successive excavation campaigns conducted between 2014 and 2024, except for a break in 2020 due to the COVID-19 pandemic. Excavations between 2014 and 2022 focused on areas A, B, and C. In 2016, a sounding was initiated in area D. However, due to the landowner's restriction on continued excavations in zones A, B, and C, we shifted our work to zone E in 2023. In 2024, we commenced detailed stratigraphic control on a 50-metre-long section, up to 3 metres in height, exposed during bulldozer activities (Figs. 2, 3).

KHuraysān is a slope site. Successive occupations were distributed along the incline, with habitation structures arranged on terraces running perpendicular to the slope. Each subsequent occupation phase established new terraces atop the previous ones (Monik *et al.* 2018).

Zone A

In this area, structures belonging to various occupation phases were documented after the removal of the surface sediment layer (Fig. 4). In the central area, within band 100, squares H, I, and J, three oval huts buried in the terrain



1. Map with KHuraysān (Kharaysin) and other Neolithic sites.

were discovered, corresponding to the earliest occupation phases of the site (Fig. 5). In H100, two of these superimposed huts are identified (Fig. 6). From the upper hut (structure 1), the north wall is preserved, associated with remains of a lime-plaster floor. Beneath it, we documented another oval hut with a packed-

earth floor, designated as structure 2 (Figs. 6, 7). This hut is dated between 9237 and 8830 cal BC, at the end of the Pre-Pottery Neolithic A (PPNA) period. Both huts were affected by two subsequent circular pits from the Middle Pre-Pottery Neolithic B (MPPNB) period.

In squares IJ100, we documented another

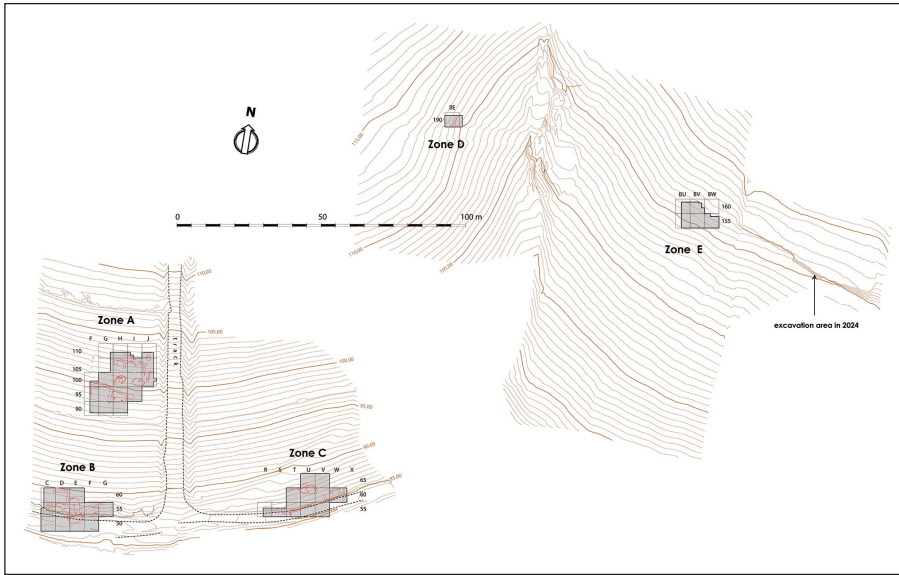


2. The site with the location of the excavation areas.

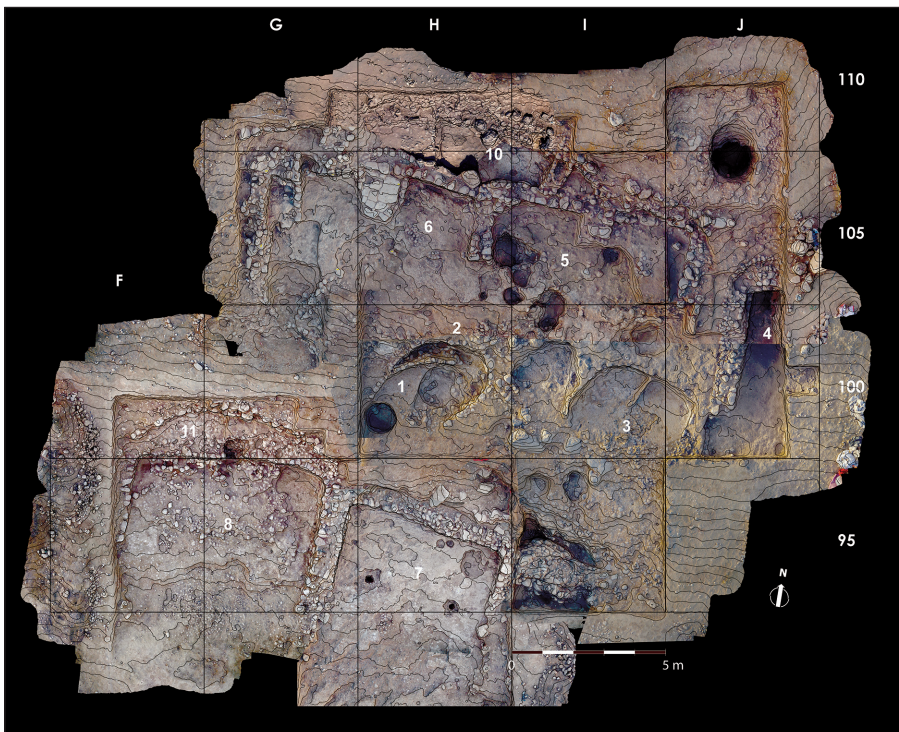
buried hut (structure 3), with a morphology between oval and rectangular (**Fig. 8**). The internal surface is divided into two rooms by a narrow mud wall. The western room is interpreted as an oven or hearth, as the floor was covered by a set of thermally altered cobblestones. The floor of the main room was covered by a layer of lime plaster, which extended up the walls as a coating. The circular pit filled with stones observed in the main room was likely a hearth. A portion of the lime floor around the hearth was painted with red

pigment. Two radiocarbon dates obtained from charcoal fragments place this structure between 9111 and 8629 cal BC. Huts 1 and 3 are likely contemporaneous (**Fig. 9**) and slightly later than hut 2.

In bands 105 and 95, two alignments of rectangular structures with lime-mortar floors were documented, dated to the MPPNB, with radiocarbon dates between 8160 and 7594 cal BC. The two lines of structures are parallel and located 10m apart (**Fig. 10**). The northern walls of the structures are perpendicular to the slope of



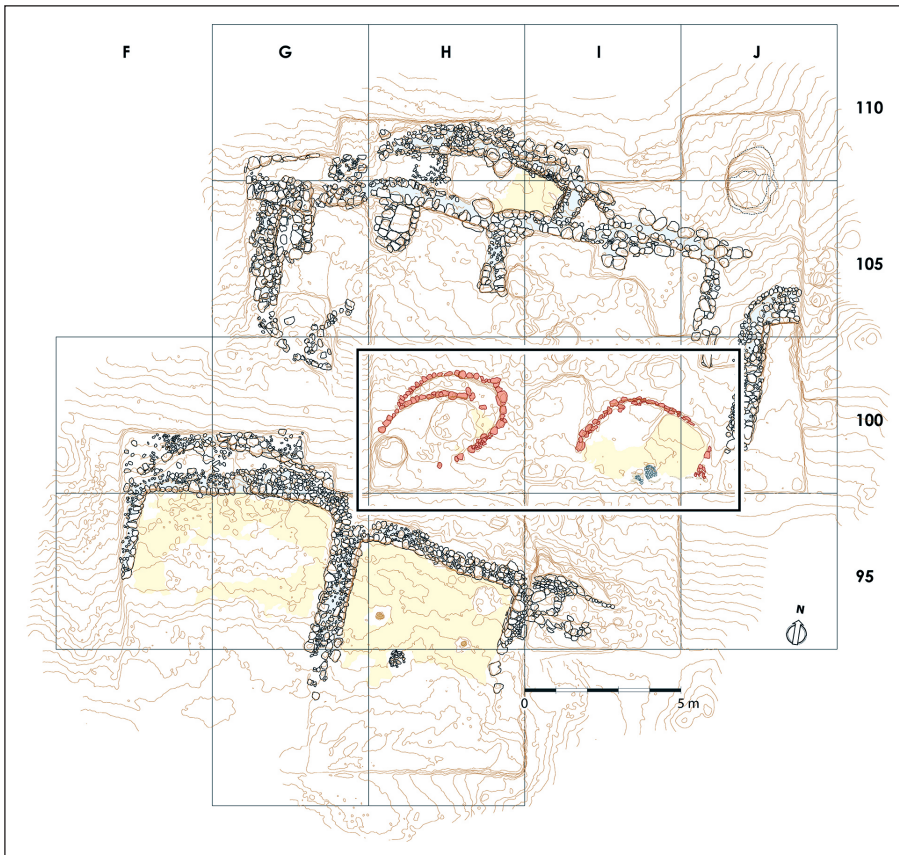
3. Topography of the site with the excavation areas.



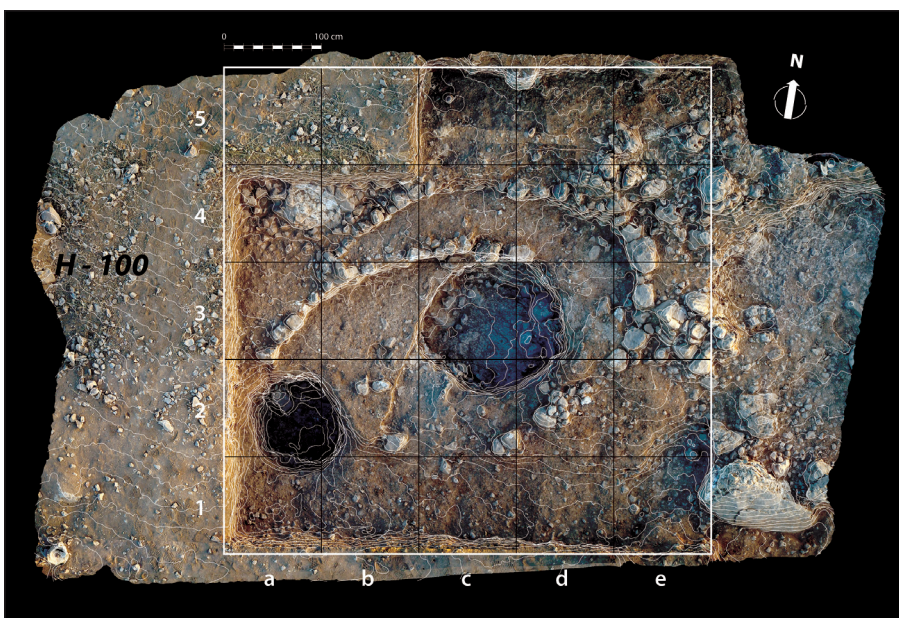
4. Orthophotography of zone A.

the terrain. The southern parts of the structures were destroyed by slope erosion. It is likely that both lines of structures are contemporaneous and reflect the organization of houses in the MPPNB. The houses were arranged adjacent to one another, sharing the north-south wall, with the northern part of the house buried in

the slope and the southern part freestanding. Circulation and access to the houses would have been from the south. In the northern line, three structures are distinguishable (**Fig. 11**). In the southern alignment, two houses sharing a wall in GH 90-95 are discernible (**Fig. 12**). Beneath these two houses, another larger rectangular



5. Plan of zone A.



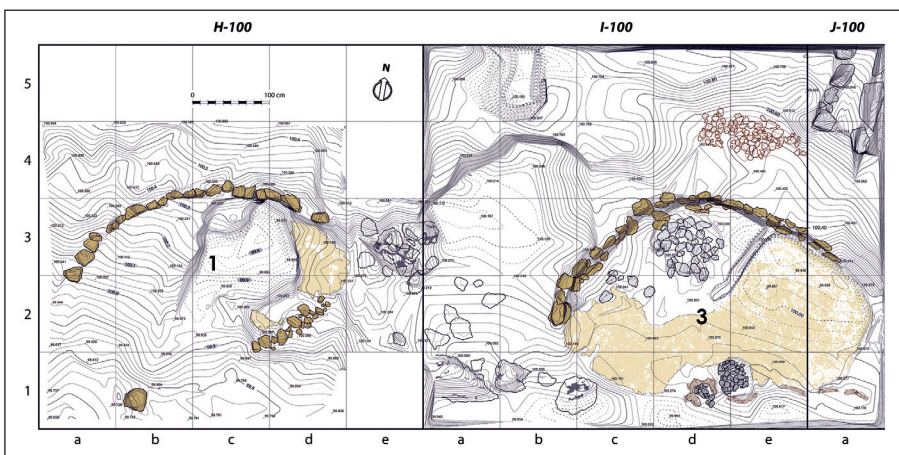
6. Orthophotography of structures 1 and 2.



7. View of structures 1 and 2.



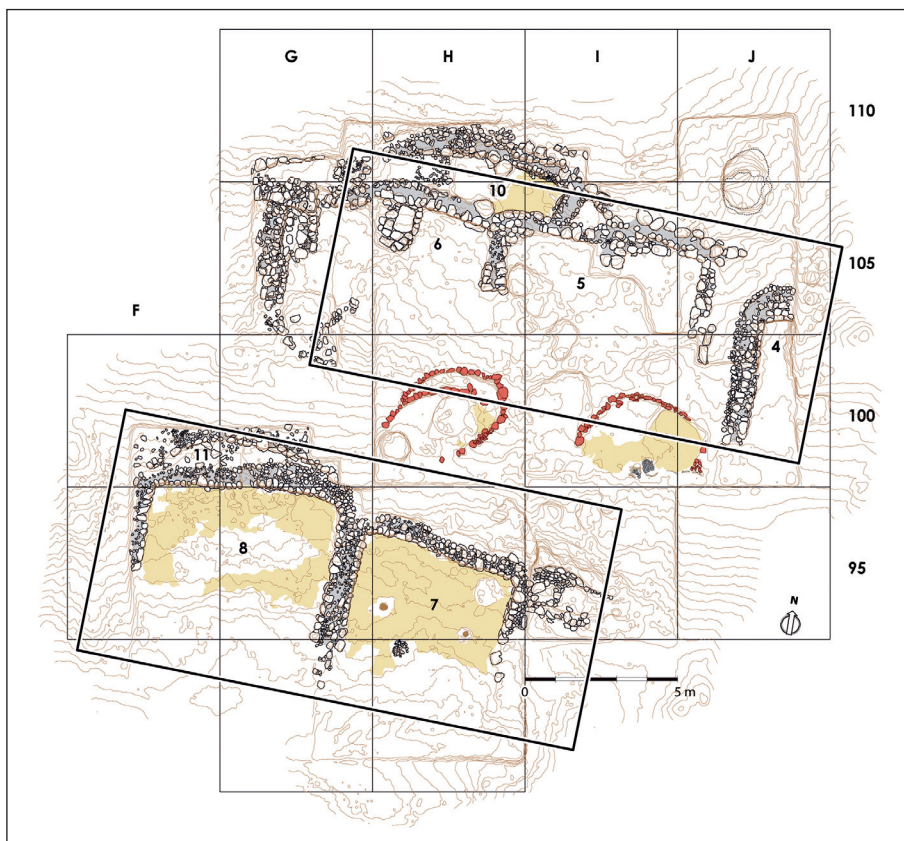
8. Overhead view of structure 3.



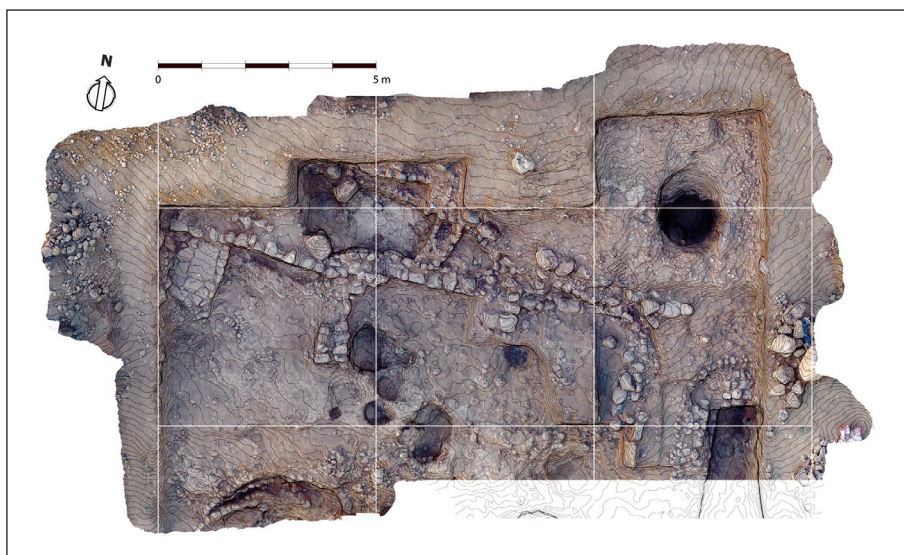
9. Structures 1 and 3.

structure was found (**Fig. 13**), measuring 8m on the north-south axis and 7m on the east-west axis (structure 9). The floor, covered with lime mortar, has two post holes that were part of the roof support system. Additional posts, embedded in the side walls, also served to support the roof. This house is also dated to the Middle PPNB, between 8202 and 7764 cal BC, although it slightly predates the two houses superimposed on it.

To summarize, in zone A, we have identified four architectural levels. Hut 2, an oval and buried structure with a packed-earth floor, corresponds to the oldest level, dated to the end of the PPNA, *ca.* 9000 cal BC. Huts 1 and 3 represent the part of the transition level between PPNA and PPNB, dated to *ca.* 8800 cal BC, with architectural forms evolving towards rectangular morphologies and lime-mortar floors. Level 3 is attributed to the MPPNB, with



10. Lines of structures in zone A, Middle PPNB.



11. Orthophotography of the northern line of structures.

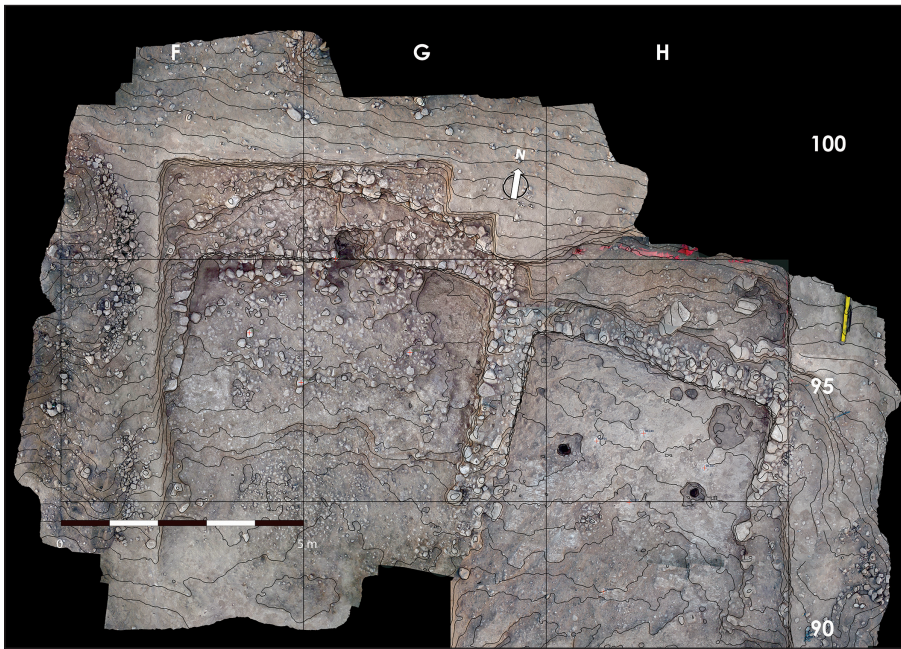
dates around 8000 cal BC, including structure 9, a large rectangular house with a lime-plaster floor. Level 4, also dated to the MPPNB, around 7800 cal BC, consists of two parallel lines of square houses.

Zone B

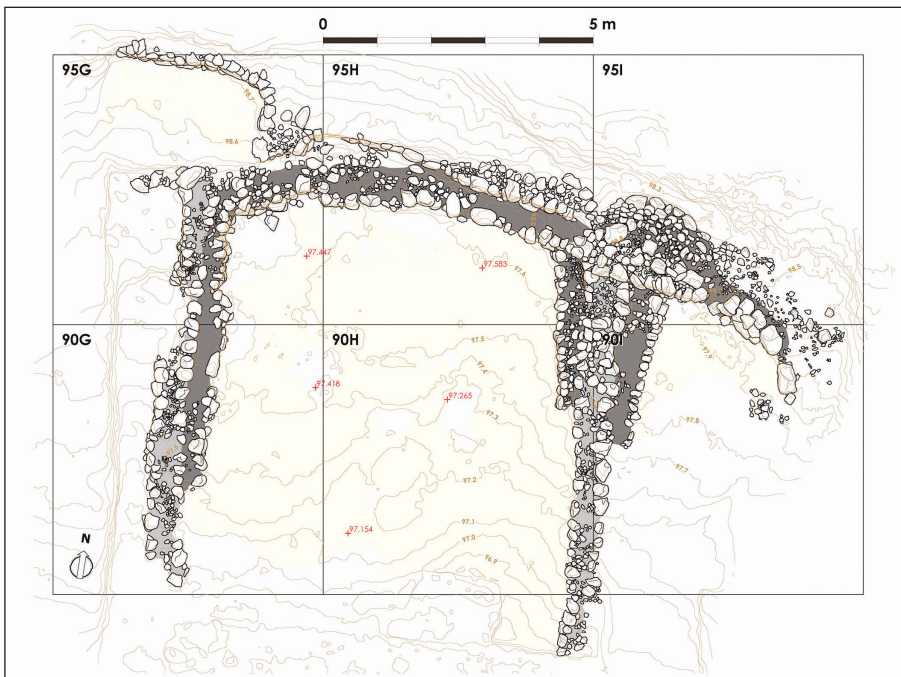
In zone B, we have distinguished four superimposed architectural levels (Figs. 14, 15). After excavating the surface levels, in squares BC/55–60 we found the remains of two superimposed rectangular houses with lime

floors, dated between 8248 and 7786 cal BC, in the MPPNB. They have a width (east-west axis) of 6m, while their length is incomplete due to erosion on the southern part caused by the slope.

Below this architectural level, we documented an older level dated to the EPPNB, dating between 8500 and 8300 cal BC (Figs. 16, 17). This level consists of the remains of five domestic structures (structures 15, 16, 17, 18, 19, and 20). Within structure 15, only the remains of the lime floor in the northern



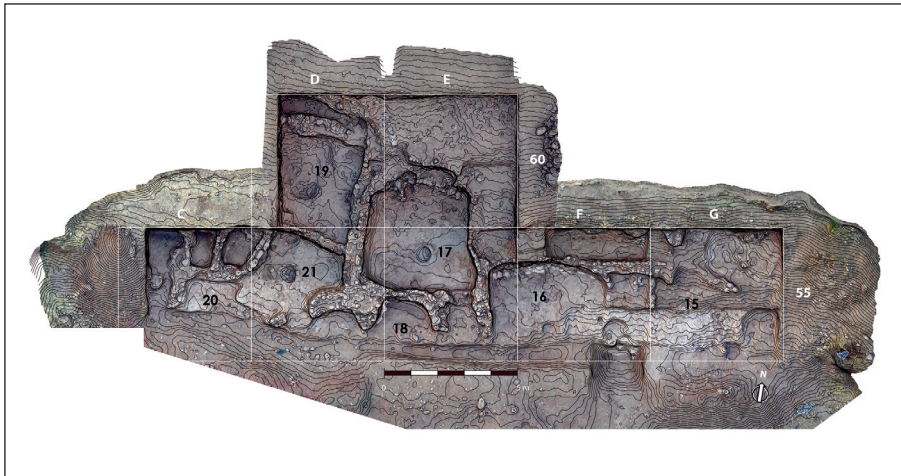
12. Orthophotography of the southern line of structures.



13. Plan of structure 9.

limit of the house and a part of the NW wall are preserved. These remains border another domestic structure to the west, of which the northern half is preserved (structure 16). The morphology of this structure is rectangular, although the NE corner is rounded. The floor is covered with lime mortar, where a circular

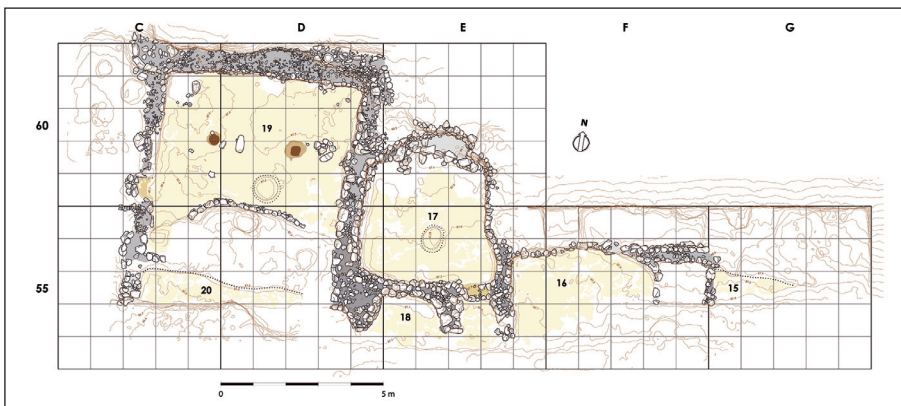
pit hearth is located at the southern limit of the preserved part. The western wall of structure 16 is shared with structure 17, located farther west. Structure 17 is a house with a rectangular shape, but it features rounded corners and a slightly sinuous eastern wall. The floor is also covered with lime mortar, except for the northern third,



14. Orthophotography of zone B in 2018.



15. Orthophotography of zone B in 2021.



16. Plan of the Early PPNB structure level.

where it consists of packed earth. A circular basin hearth is positioned in the centre of the room, in the part covered by lime mortar. The entrance is in the SE corner and is accessed via a short corridor, which opens into another space, structure 18, of which only a small part is preserved. To the west of structure 17 is structure 19 (Fig. 18), a larger domestic building (36m²), with a completely rectangular layout. The roof was supported by two wooden posts located in the centre of the room and by posts embedded

in the walls. The floor was originally covered with lime mortar, which was preserved in some areas at the time of excavation. A basin hearth filled with ashes is located near one of the post holes that supported the roof. The entrance to the building was through a narrow door with steps, positioned in the southern part of the western wall. This house was burned prior to its abandonment, leaving diverse objects on the floor, such as a grinding stone in a position for use and various human remains. Three



17. View of zone B in 2021.



18. Structure 19.

skulls were embedded in the western wall (**Fig. 19**), while in a square pit located in the NW corner of the house, the remains of at least five individuals were found. To the south, this house, structure 19, bordered another house, structure 20, of which only the northern part is preserved, extending about one metre along the north/south axis. The shape of the structure is rectangular with rounded corners, and its floor is covered with lime mortar. A polygonal structure (structure 21) was built over this group of houses (see **Fig. 14**). It consists of two rooms at different levels, connected by a door and a step. The basin hearth is located in the upper room. Structure 21 cuts through structure 19 and overlaps structure 20. It is dated between 8300 and 8000 cal BC, during the transition between Early and Middle PPNB.

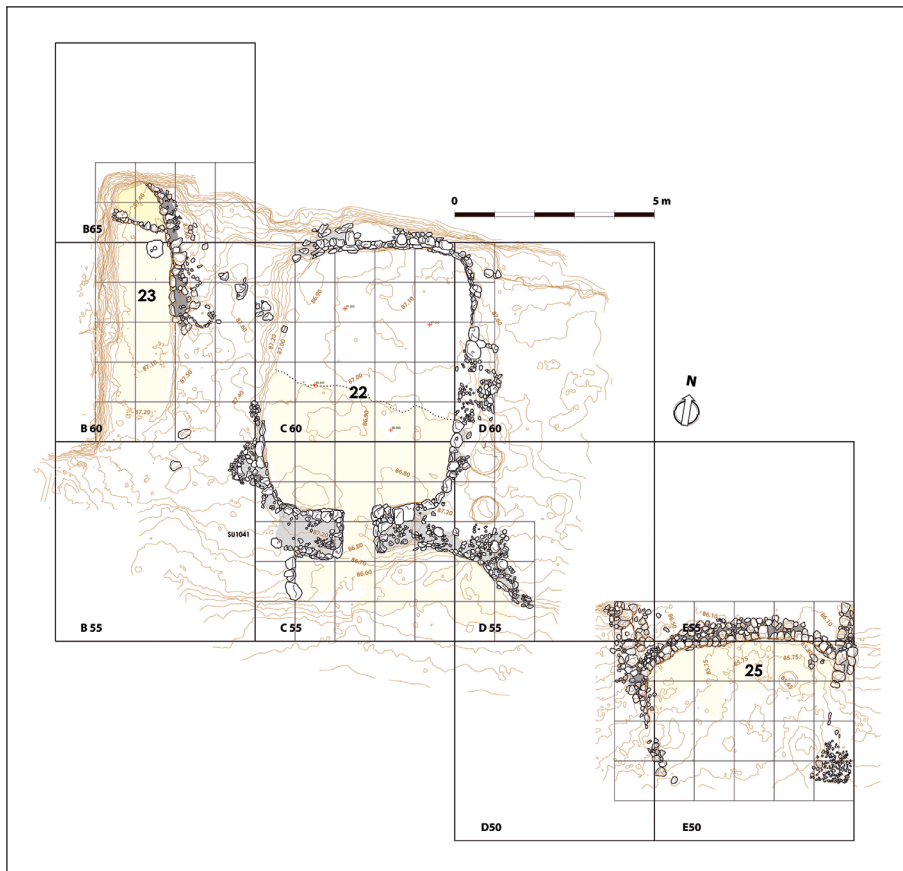
Thus, the EPPNB house level consists of a series of nearly rectangular structures with rounded corners, built adjacent to one another. The house complex was constructed with its northern section embedded within the natural slope, while the southern part would have been freestanding. The floors of the houses were covered with lime mortar and featured basin hearths. Within this complex, one of the houses, structure 19, stands out due to its distinctive morphology, which is completely square and larger than the other structures. This house was burned before the abandonment, and it contained

numerous human remains. The presence of the ancestral remains suggest that the inhabitants of this house likely held a certain authority within the community.

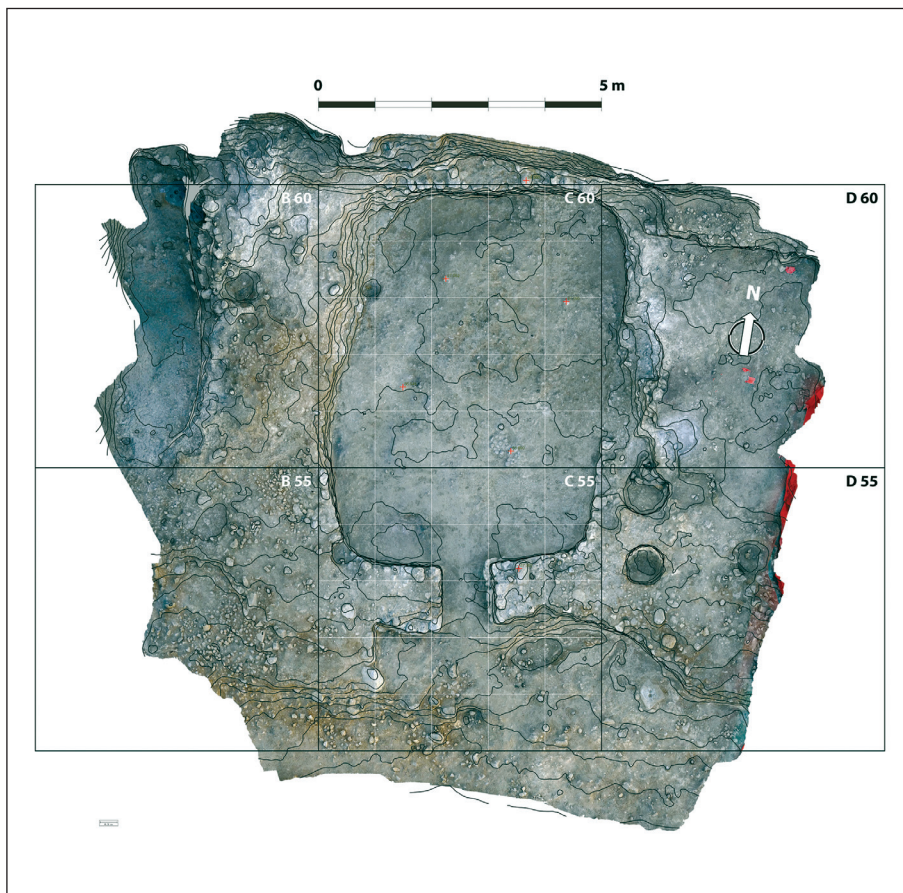
Beneath this EPPNB level, we discovered another architectural level comprising three buildings (**Fig. 20**). This level is dated between 8800 and 8500 cal BC and it corresponds to a transitional phase between the Final PPNA and the Early PPNB. These structures are subterranean. Building 22 consists of two rooms connected by a 1m-long corridor (**Figs. 21, 22**). The southern room was partially truncated by a bulldozer in its southern part. A curved wall to the NE and a straight wall with an orthogonal angle in the NW are preserved. On the packed-earth floor, we found a stone slab with a cup-mark. Two burials were discovered in this room. To the north, the corridor leads to a large rectangular room of 35m², with rounded corners. A circular basin hearth is set into the packed-earth floor. Structure 23 is also a subterranean house, of which the eastern part has been uncovered, as the rest lies beneath a field where excavation permission has not been obtained (**Fig. 23**). In its southern area, it has an elevated platform. Similar to the previous building, a stone slab with a cup-mark is embedded in the packed-earth floor. Structure 24 is located to the west (**Fig. 24**). It is delineated by two straight walls extending northward, beneath the structures of



19. Skulls embedded in the wall of structure 19.



20. Plan of structures from the PPNA/PPNB Transition level.



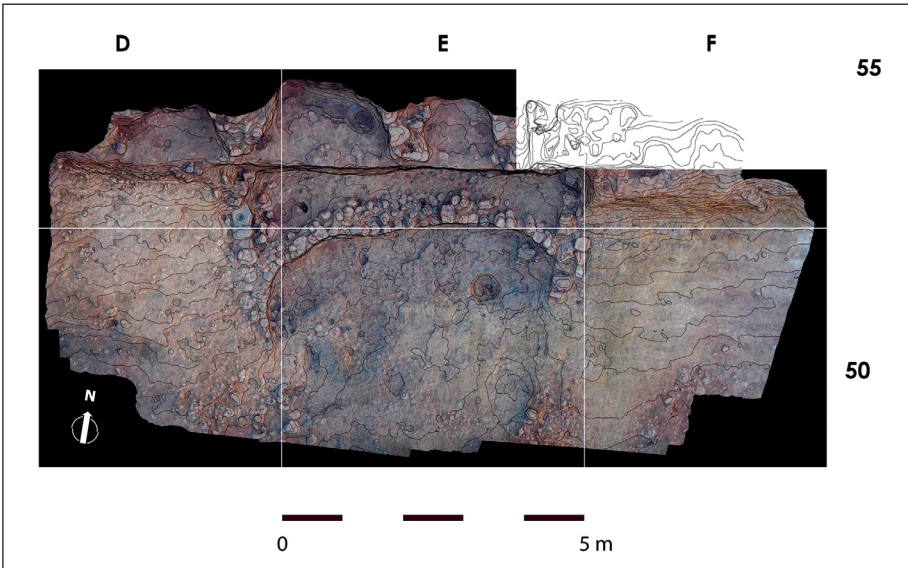
21. Orthophotography of structure 22.



22. View from the north of structure 22.



23. View of structures 23 (left) and 24 (right).



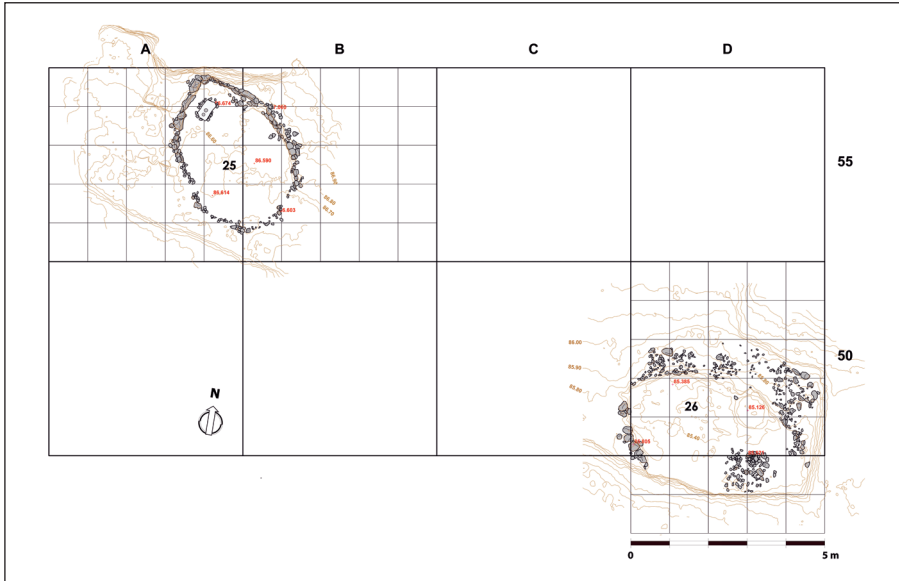
24. Structure 25.

the EPPNB level. To the north, the structure is bounded by a wall perpendicular to the two lateral ones, with curved ends. The southern part of the structure was destroyed by slope erosion.

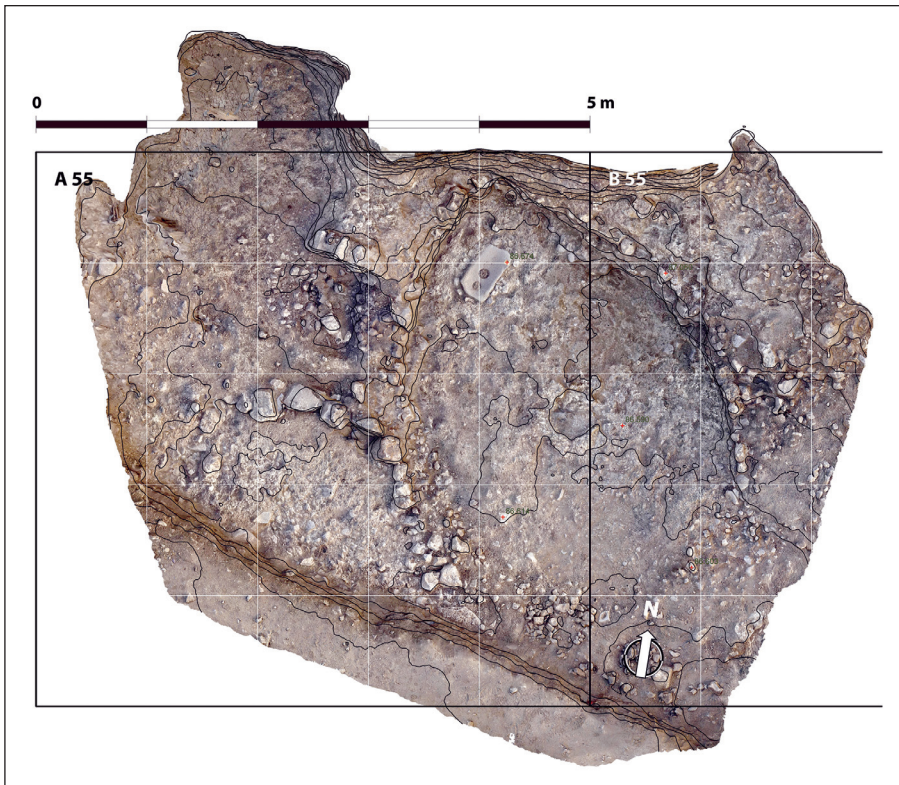
The transitional level between PPNA and PPNB features a series of constructions where curved forms blend with straight lines and orthogonal angles. Interior spaces increase considerably in size compared to the previous period at the end of the PPNA. The buildings

are subterranean and organized parallel to each other, though not contiguous.

In the oldest level of zone B, we discovered two oval huts, dated between 9235 and 8776 cal BC, at the end of the PPNA (**Fig. 25**). Structure 25 is a subterranean oval hut measuring approximately 4m by 3m (**Fig. 26**). The floor is made of packed earth, where a stone slab with a cup-mark is inserted. Structure 26 has similar dimensions and is also a subterranean oval hut.



25. Plan of the oval structures in zone B.



26. Orthophotography of structure 25.

Zone C

In this area, we found the remains of two rectangular structures built on the surface, dated to the MPPNB, between 8000 and 7600 cal BC (Fig. 27). The northern part of structure 27 is preserved in squares VW60, while the southern part was destroyed by a bulldozer. Two successive lime-mortar floors and two burials inside the house were documented. Structure 28 preserves the northern and eastern walls of a rectangular house with a lime-mortar floor, in squares TUV60 and U65. Two rooms were identified in the preserved part of the house, divided by a small mud wall. The floor of the western room was decorated with red paintings. The painted floor was extracted, restored, and is now displayed in the Museum of Archaeology at the ‘Ammān Citadel.

Zone D

Zone D is located in Squares BE 190–195, where we dug a trench 6x4m in size in 2017. In the first layer of the excavation, we found a wall 90cm wide. A secondary burial with indications of cremation (Iriarte *et al.* 2020; Santana *et al.* 2020) was excavated near the wall, in the east. We continued excavating to the north of the wall, where we reached a floor of compacted clay corresponding to a previous architectural level. The burnt human remains of the burial were radiocarbon dated, yielding a chronology of 7058 to 6825 cal BC.

Zone E

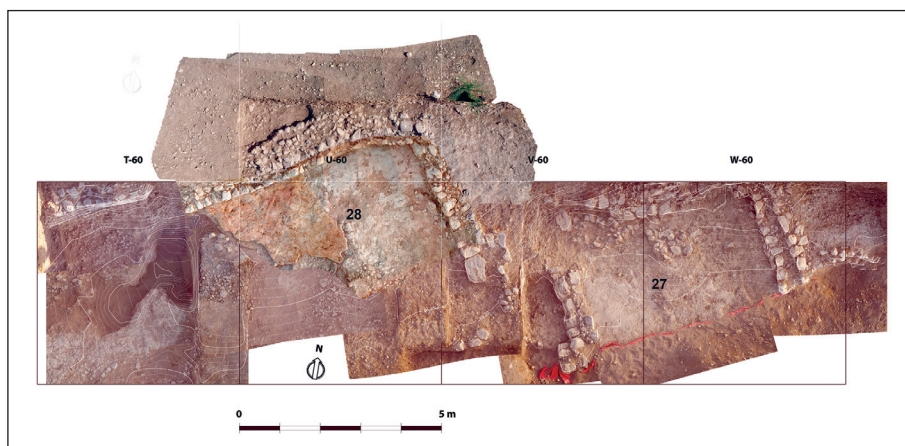
In 2023, we excavated in area E, located to the northeast of the areas A, B, and C and to the east of area D. The excavation was carried out in the squares BS, BT, BU/55, and 60. A partially semi-sunken square-shaped building

was discovered (Fig. 28). Part of the north and east walls of the house were preserved. The floor was covered with lime plaster, and two successive lime-plaster floors were identified. The upper floor was painted red, with the colour preserved in the eastern part of the house, while the lower floor was unpainted. The fireplace, a round pit, was full of ashes. A posthole surrounded by stones was detected at the west of the fireplace. This level is dated in the second half of the 8th millennium cal BC.

A sunken room was discovered in square BV55, measuring 4x2m. The periphery was constructed with vertical slabs at the base, topped with smaller stones. The floor was made of clay. This room was filled with rubble, consisting of stones and fragments of pottery, which were part of large storage receptacles. A sickle blade, tentatively dated to the Yarmoukian period, was found among the rubble debris. Several pounding and milling tools were found on the room’s floor. Based on these findings, we provisionally attribute this room to the Yarmoukian period.

Plant and Faunal Remains

The preliminary analysis of plant remains at KHuraysān offers insights into plant subsistence strategies during the LPPNA–MPPNB occupation in NW Jordan. The archaeobotanical assemblage includes seeds, chaff, nutshell fragments, amorphous residues, culm nodes, stems, and animal pellets. Among the identified remains, pulses are dominant, mostly represented by lentils (*Lens culinaris*) and faba beans (*Vicia faba*). Possible chickpea (*Cicer* type), grass pea (*Lathyrus* type *cicera*, *L.* type *inconspicuus*), pea (*cf.* *Pisum* sp.) and vetches



27. Structures in zone C.

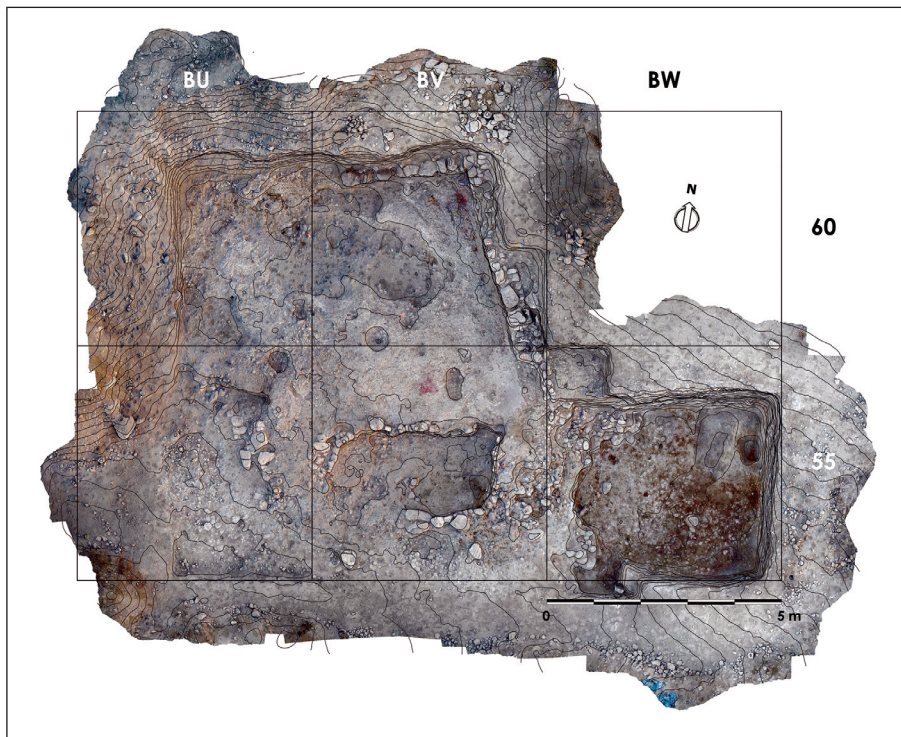
(*Vicia ervilia*, *V. sativa*) were also recorded. Although three glume bases were found, cereal are mainly represented by grains, though in low quantities. Despite the high fragmentation rate, barley (*Hordeum vulgare*) and wheat, including einkorn (*Triticum monococcum*), are attested. Fruits are dominated by fig achenes (*Ficus carica*), but this result needs to be nuanced due to the high number of seeds per fruit. The samples also contain numerous nutshell fragments of pistachio (*Pistacia* sp.), some of *Prunus*/*Amygdalus* sp., and other pieces of unidentified nutshells. Grape pips (*Vitis vinifera*) are also present. The archaeobotanical material from KHuraysān is particularly rich and provides valuable information about plant cultivation, processing and consumption during the Early Neolithic period in northwest Jordan. These preliminary results suggest that, as in other contemporary southern Levantine sites, particularly in the Lower Galilee, crop exploitation was mostly oriented toward pulses. However, the diet was not limited to lentils, peas, chickpeas and faba beans; the inhabitants also collected fruits such as figs and likely used wild palatable plants.

Regarding faunal remains, the assemblages are dominated by goats and gazelles, followed by bovines (wild or domestic cattle), suids (wild or domestic pig), and small carnivores such as

foxes (*Vulpes* sp.) and wild cats (*Felis silvestris*). When considering the main animal groups (goat, gazelle, equids, suids, bovines, small carnivores, hares, and birds), their relevance evolves through time. Gazelles, cattle, and small game dominate the spectra of faunal remains during the Late PPNA and PPNA/PPNB transition. From the EPPNB, the consumption of goats clearly increases, becoming dominant during the MPPNB and even more important during the Late PPNB. Most probably, the rise in goat exploitation during the EPPNB indicates the first herding of goats. During the Late PPNB, the analysis of zone E indicates that goat exploitation is still dominant, but suids are more often present than before and gazelle hunting becomes very marginal.

Material culture

The majority of the knapped stone industry was produced in flint, ranging in colours from beige, brown, and grey to the more prevalent purple and pink varieties. Obsidian from Anatolia was also used, albeit in marginal quantities. During the Final PPNA, knapping techniques focused on the production of unidirectional blades and bladelets, as well as flakes (Fig. 29). Among the retouched tools, retouched flakes and blades and further burins and denticulates



28. Orthophotography of zone E.

are prominent. Sickie blades, although in low number, and small, tanged projectile points were also documented. In the transitional period between PPNA and PPNB, starting around 8800 cal BC, alongside the aforementioned knapping techniques resting on unidirectional core exploitation, bidirectional blade cores began to appear. Projectile points became more abundant, with a wide variety of forms documented, including types with lateral notches and short tangs (**Fig. 30**). The set of retouched

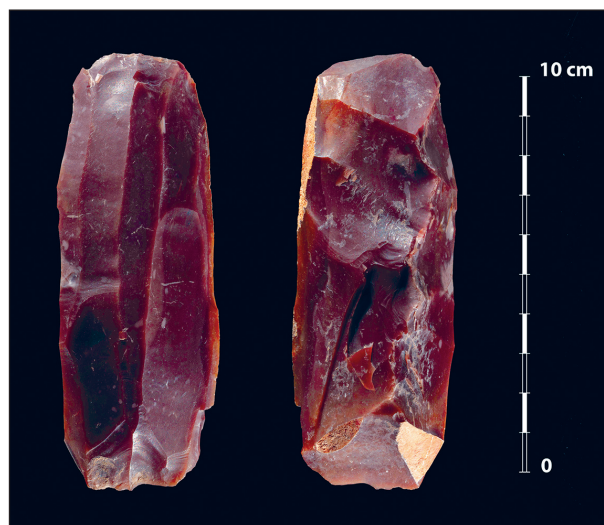


29. Unipolar core.



30. Projectile points.

tools comprises scrapers, burins, borers, laterally retouched blades and flakes (often with shallow retouch), as well as bifacial flint adzes and tranche axes. It is during this transitional period that the presence of Anatolian obsidian is most notable, accounting for almost 2% of the general assemblage. Obsidian appears in small quantities, with regular bladelets and small flakes predominating, often being recycled to the last fragments. In the EPPNB, from 8500 cal BC onwards, the bidirectional knapping technique became dominant with larger blades becoming overall targeted products (**Fig. 31**). Projectile points and sickie blades become more common, where a standardization in projectile point types is apparent, focusing on the production of Jericho points. These characteristics of the EPPNB industry continue into the MPPNB. During this period, with a dedicated and dominant bidirectional production of blades, flint was also used to create figurines representing human bodies, which are associated with the funerary context (Ibáñez *et al.* 2020) (**Fig. 32**).



31. Bidirectional core.

Milling and pounding tools are abundant at the site. In the earliest levels, before 8400 cal BC, rectangular stone slabs were inserted into the packed earth floors of the houses (**Fig. 33**). The slabs feature a cup-mark that was used to crush legumes with a stone pestle, while the

flat surface of the slab was used for grinding. From the Early PPNB onwards, the slabs with cup-marks are replaced by hand mills, where grinding was carried out with a smaller stone in a back-and-forth motion (**Fig. 34**).

The bone industry is also well represented, especially in the PPNA and PPNA/PPNB Transition levels, with the appearance of needles, awls, and spatulas. Among the small finds, the presence of fired clay figurines and necklace

beads stands out, with shell beads dominating in the early periods, while stone beads become more common from the PPNB onwards. In zone E, dated to the second half of the 8th millennium cal BC, the use of fossils decorated with incised lines is observed (**Fig. 35**).

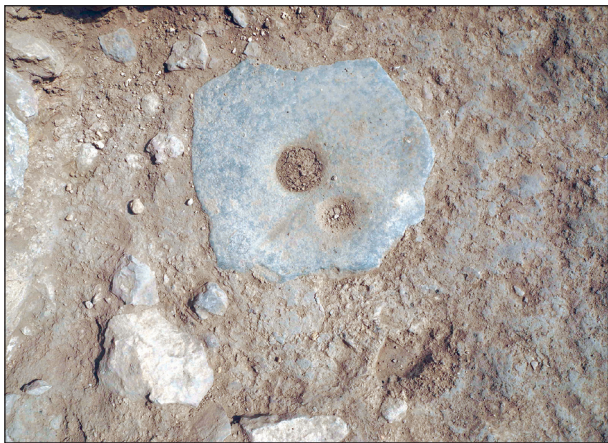
Conclusions

KHuraysān presents a broad sequence of occupations between 9000 and 6800 cal



32. Flint figurines.

BC, starting from the end of the PPNA. The transition levels between the PPNA and PPNB, dating between 8800 and 8500 cal BC, are especially significant, as this is a very poorly documented period that is only beginning to be understood through excavations carried out in the desert region of Badia (Bartl 2018; Fujii 2024). This evidence from KHuraysān indicates that the transition between PPNA and



33. Stone slab with cup-mark inserted in the packed earth floor in structure 23.



34. Grinding stone found in use position in structure 19.



35. Decorated fossil found in zone E.

PPNB was occurring at such early dates not only in the Jordanian desert regions but also in the highlands with a Mediterranean climate. The dates when this transition occurred are not very distant from those observed in the Euphrates area (Stordeur 2015), leading us to believe that the changes that gave rise to the Neolithic occurred almost simultaneously in distant regions, reflecting a high degree of interregional connectivity during this period (Ibáñez *et al.* 2018).

KHuraysān also plays a key role in understanding the advances in architecture that occurred at the origins of the Neolithic, showcasing the shift from small subterranean oval huts to large rectangular houses built above the ground. The site also provides insights into the origins of agriculture and animal husbandry, with evidence indicating that the settlement's subsistence strategy was centred on the exploitation of pulses and goats.

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PRELIMINARY REPORT ON FIELDWORK AT NEOLITHIC AL KHAYRĀN IN WĀDĪ ‘ASSĀL, WEST-CENTRAL JORDAN

Matthew V. Kroot

Introduction

The early Neolithic (**Table 1**) site of Al KHayrān is found in the west-central Jordanian Highlands. It is located along the upper reaches of the southern ridge of Wādī ‘Assāl (also spelled ‘Asal, ‘Isal, Issal, or Easal) in an area known locally as Ar Ruṣays (**Fig. 1**). Al KHayrān was first identified for the international archaeological community by the Wādī ‘Assāl Survey, which recorded a mix of early Neolithic and Chalcolithic/Bronze Age artifacts at the site (Jacobs 1983). The ‘Assāl-DHirā’ Archaeological Project investigated the early Neolithic component of the site through systematic surface collection, systematic sub-surface testing, and extensive horizontal excavations. This work identified a single structure, constructed and reconstructed in two phases, and associated refuse, dating to the Pre-Pottery Neolithic B (PPNB).

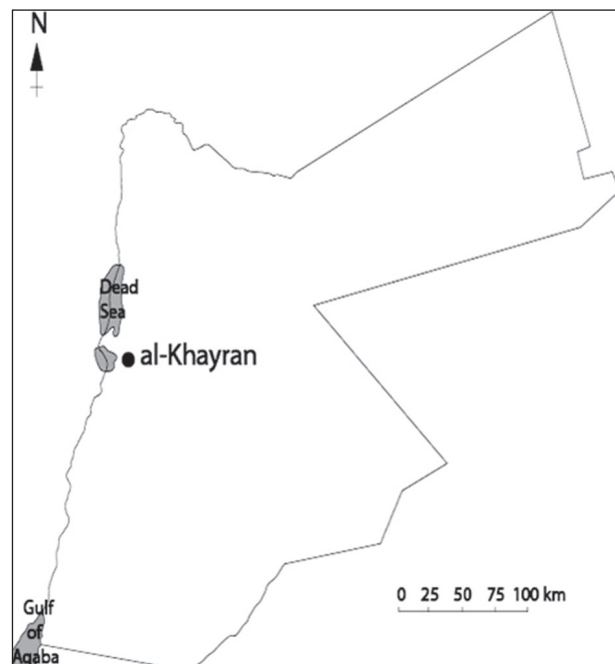
Table 1. Chronology for the Early Neolithic of the Southern Levant (Birkenfeld *et al.* 2024).

Period	Dates cal. BC
Pre-Pottery Neolithic A (PPNA)	9750-8500
Early Pre-Pottery Neolithic B (EPPNB)	8500-8250
Middle Pre-Pottery Neolithic B (MPPNB)	8250-7500
Late Pre-Pottery Neolithic B (LPPNB)	7500-7000
Final Pre-Pottery Neolithic B/Pre- Pottery Neolithic C (FPPNB/PPNC)	7000-6400

Methods

Surface Collection

A program of systematic surface collection was conducted at the site to identify not only the spatial extent of surface archaeological remains, but also the structure of these remains. Based on the information provided by Jacob’s in her (1983) publication, the site of Al KHayrān was relocated and the spatial extent of the site was determined through field walking. Following this, surface collection samples were made across the areal extent of the site using ten



1. Map of Jordan showing the location of Al KHayrān (Drawing: M. Kroot; ‘Assāl-DHirā’ Archaeological Project).

square meter “dog” leash units, spaced at 15m. First, a series of 40 collection units were laid onto the site in two lines running north-south and east-west. The ends of the collection lines were determined to be when three units in a row returned no artifacts.

Non-collection methods were used at Al KHayrān. Within each collection unit, analysts would gather all visible archaeological materials and then sort these materials by both artifact class and typology. For example, knapped stone materials were sorted into hammer stones, cores, flakes, blades, chips, chunks, and formal tools. All lithics were examined for evidence of retouch and use-wear. Formal tools and cores were sorted into specific chronologically and technologically diagnostic types. Ceramics were sorted based on paste, temper, thickness, and decorative elements, again with attention to chronologically diagnostic indicators. Once sorted by detailed type, all artifacts were placed on a contrasting background with a scale bar and photographed on two or more sides with a DSLR in order to capture potential relevant metrical, technological, and unrecorded details, which would allow for further analysis after the completion of fieldwork. A unique number was assigned to each unit, and types, counts, and photo numbers were recorded. Artifacts were then returned to the surface of the collection unit.

Initial results identified a lack of ceramics and a substantial number of bidirectional cores and blades (Quintero and Wilke 1995) and multiple formal point types (Gopher 1994) typical of the PPNB in the north-east quadrant of the collection units. Jacobs (1983) also identified this same portion of the site as the source of the early Neolithic knapped stone artifacts recovered during survey. In order to define the extent of the PPNB surface scatter at Al KHayrān, a further 64 dog-leash collection units were made in the north-eastern part of the site. They were spaced at 15m in a triangulated pattern and used the same non-collection sampling method described above. The extension of collection units was terminated in any given direction when two consecutive samples returned no archaeological materials. Surface collection results identified early Neolithic materials, characterized by the

above-mentioned bidirectional cores, blades, and point types typical of the PPNB, over an area of approximately 0.38ha.

Site Mapping

Once the full areal extent of the site was determined, detailed spatial data from Al KHayrān was generated by Jamal Safi of the Department of Antiquities of Jordan. This included site topography and archaeological features and structures visible on the surface, as well as natural resource locations. A datum of rebar and concrete was placed at the highest point on the site, and its exact three-dimensional location was identified using a Trimble differential GPS system. A total station was placed directly above the datum from which individual points used for the topographical points and resource locations were shot. For the topographic map, starting on the northern edge of the site, an individual with a prism walked east-west transects, stopping every five meters for another datum point. Once each transect was finished, the individual would move five meters south and walk another set of transects until the entire surface area of the site was mapped.

In order to outline all architectural remains and resource locales visible on the surface of the site, individual points were shot in sequences at key spots to form polygons that represented the two-dimensional forms of these resources overlaid on the three-dimensional surface map of the site. A similar technique was used for spatially extensive natural resources, such as a flint source 100m southeast of the site, while other, smaller resource locales, such as a seep 100m south of the site, were recorded with a single point.

Test Excavations

In order to determine the sub-surface extent of archaeological remains, a series of test excavations were made. Preliminarily, three 2×1m test excavation units were dug into the site based on the results of the surface collection. One unit was located at the center of the early Neolithic surface scatter, one in the south-west (upslope) corner of the collection units returning early Neolithic remains, and one within the Chalcolithic / Early Bronze Age returns from the site. The first was intended to

determine if the center of the surface scatter was truly the center of the remains, given the fact that Al KHayrān is located on a hill slope running downhill to the north-northeast. The second unit was intended to determine how far up the hillside the site extended. The third unit was intended to determine if possible early Neolithic remains were buried below the much more substantial Chalcolithic/Bronze Age materials at the site.

Each of the test units was dug in 1×1m squares, with excavations following depositional stratigraphy. Before excavations commenced, a unit datum to be used to locate materials in three dimensions with line levels and tape measures was shot in using a total station. The units were strung, and the surface of each unit was scraped with the tips of square-bladed shovels. All surface materials and, later, excavated deposits were screened using 2mm mesh. All knapped stone, ground stone, ceramics, animal bone, and other small finds were collected for analysis.

Individual *locus* numbers were assigned for each discrete deposit, and each *locus* was drawn within each 1×1m unit at the commencement of excavation and the termination of *locus* excavation, as well as in 0.1m levels when *loci* had depths greater than 10cm. These drawings included soil characteristics (e.g. color as determined with a Munsell chart, grain size, friability, inclusions), deposit morphology (planview shape and upper and lower deposit elevations), and larger inclusions, such as stones or plaster. Each *locus* and the excavation procedures used in the field were summarized in a form that accompanied the drawing and included the starting and ending elevations for each corner of the 1×1m unit. All architectural features and *in situ* artifacts were drawn in place and their top and bottom elevations were recorded. Before the removal of architecture, a plan view that recorded the entirety of the removed construction was done as a single drawing. The terminus of each excavation unit was determined to be when 0.2m of deposits had been excavated without yielding any further archaeological materials. Upon the termination of excavation, all four walls of each trench were drawn in profile, which included deposit descriptions and assigned *locus* numbers.

The test excavation in the center of the surface scatter identified up to 0.1m of a archaeological deposits. Materials were almost exclusively knapped flints and included significant number of diagnostic early Neolithic artifacts, primarily in the form of bidirectional blades. Both of the other test units, on the southern edge of the Neolithic surface scatter and within the Chalcolithic/Bronze Age scatter, yielded no subsurface early Neolithic remains, although the latter did return substantial amounts of Chalcolithic/Bronze Age ceramics and, notably, both meat-bearing and non-meat-bearing ovicaprid bones.

Given that subsurface early Neolithic remains were identified only in a single 2×1m unit, it was decided that further and more systematic test excavations were needed. First, a 100m east-to-west and 60m north-to-south grid was laid over the entire area in which early Neolithic remains were identified during surface collections. Within this grid, three rows of 1m north-to-south and 2m east-to-west excavation units were dug at 20m intervals, starting in the southwest corner of the grid and moving north and east. The original test unit that yielded subsurface remains was included as one of the units in this pattern. The same procedures as used for the first three units were followed in this second phase of testing. A total of 14 additional units were excavated, with none yielding subsurface remains.

Extensive Excavations

It was decided that the sole test unit to yield subsurface early Neolithic remains would be the anchor for extensive excavations at the site. These excavations were intended to produce a broad horizontal picture of the site in order to understand the behavior of the site's occupants during the early Neolithic. The 2×1m test unit was used as the southwest corner of a 5×5m unit. Excavation procedures identical to those used for the test excavations were followed for the larger units. This included shooting in unit data, surface scraping before excavation, sieving of all deposits in 2mm mesh, the recovery of all knapped stone, ground stone, animal bone, and other small finds, excavation in depositional stratigraphic layers, the three-dimensional contextualization of architectural features and

in situ artifacts, the drawing of *loci* before, during, and after excavation, and termination of excavation once 0.2m of deposits devoid of artifacts had been encountered.

Additional 5×5m units were subsequently laid out to the north, south, east, and west of this trench, leaving the northern and eastern most 1m rows of each unit as balks. This produced an excavation grid of 4×4m units with 1m balks. Units of 1×1m were dug in all directions until two consecutive squares devoid of any subsurface archaeological materials were excavated in any given cardinal direction. In this manner, it is possible to be confident that excavations recovered materials and architecture that characterized the full areal extent of the site. In total, 146m² of subsurface deposits were identified, 73m² of which were excavated fully.

These units were the first to encounter Neolithic architecture at Al KHayrān. Once coherent deposits and architectural remains were encountered, additional excavation procedures were implemented. When structures and constructed surfaces were identified, these remains were left in place. Structure interiors were treated as separate units, regardless of location within the site grid, and were solely excavated using hand trowels. When constructed surfaces were encountered, 0.05m of deposits above the surface were excavated—again, solely with hand trowels—as a separate layer, regardless of whether a stratigraphic change was identifiable. Once architectural features were completely uncovered, drawn, and photographed, and their three-dimensional extent was recorded, some were removed to allow for further investigations below. For all stone features removed, their bottom depths were also recorded using a datum. Again, any items identified *in situ* were left in place and point-provenienced in three dimensions before removal.

Laboratory Analysis of Artifacts

All collected knapped stone, ground stone, fauna, and small finds were loaned to the author by the Department of Antiquities of Jordan for analysis. Preliminary analyses of these materials and the development of further analytic strategies were done within the

laboratories of the American Center of Research and the Council for British Research in the Levant. Additional analysis of these materials was done at the University of Michigan Museum of Anthropological Archaeology. Methods included technological, typological, metrical, and macroscopic use-wear analyses of knapped stone materials, typological, metrical, and macroscopic use-wear analyses of ground stone materials and small finds, and metrical and taxonomic analyses using the comparative collections of the Center for British Research in the Levant and the University of Michigan, Museum of Anthropological Archaeology, as well as aging, sexing, and element determination for fauna.

Results

Stratigraphy and Architecture

Most of the archaeological remains at Al KHayrān were affected by ploughing that has recently occurred over the entirety of the site. This has resulted in materials on the exterior of the structure becoming mixed within a single stratigraphic layer. It is only within the interior of the structure that the stratigraphic integrity of the original depositional processes was preserved in any identifiable way. The structure was constructed and reconstructed in two phases, with layers of collapse and anthropogenic fill in between the prepared floors of the earlier and later phase.

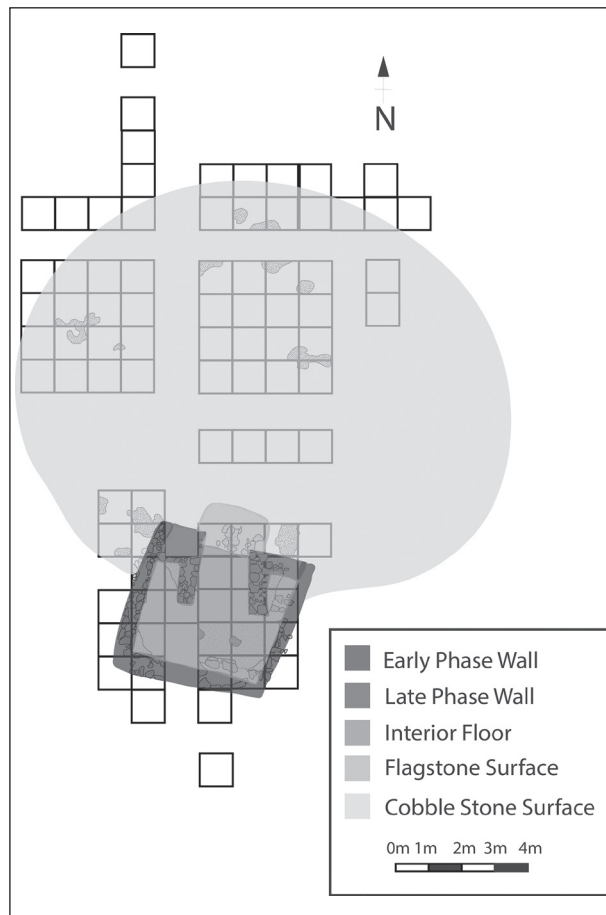
The interior floor of the earlier phase included a sandstone saddle quern and a flat sandstone slab with striations set into the floor. At the end of the use-life of the earlier phase, the structure partially collapsed. When the occupants of the site reconstructed the structure in the later phase, they utilized un-collapsed wall sections, as well as newly constructed walls. The floor of the later phase was constructed out of lime plaster and was poorly preserved due to its proximity to the present-day surface. Two different forms of exterior surfaces, one built of flagstone and the other of cobble stones, were associated with the later phase (**Fig. 2**).

In both the earlier and later phases, the structure consisted of stacked limestone block walls with prepared interior surfaces. In both phases, the walls of the structure are built in a square approximately 5×5m from exterior edge

to exterior edge of the walls, with the interior space of the structure measuring approximately 4×4m. The form and size of the structure are typical for the PPNB of the southern Levant (Banning 2003; Banning and Byrd 1989). The use of plaster for the floor of the later phase of the structure is typical of the PPNB as well (Clarke 2012). The structure was partially dug into the hillside to ensure that the floor was flat, as was the flagstone exterior surface. However, the cobble stone surface followed the natural slope of the Neolithic ground level.

Knapped Stone

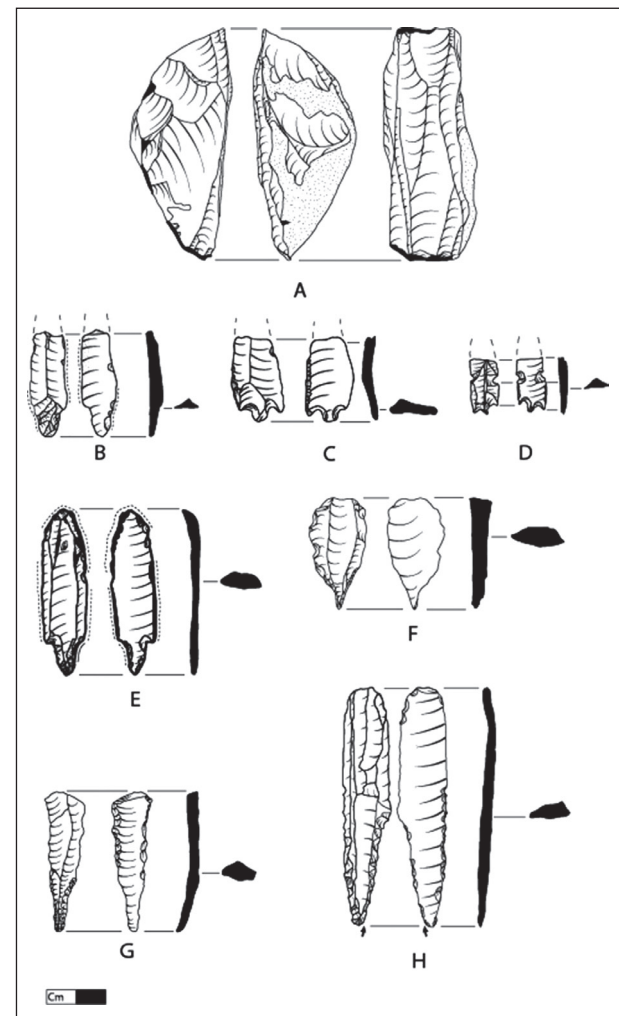
6,957 knapped stone and hammer stone artifacts were recovered from Al KHayrān during excavations, all were made using flint. There is a wide variety of colors (gray, black, brown, green, white, yellow, and red), grain sizes (small to medium), and lusters (dull to lustrous), all of which can be found at the closest



2. Schematic reconstruction of the architectural layout of the architecture at Al KHayrān, overlaid onto the planview drawing of the structure (Drawing: M. Kroot and E. Wallace; 'Assāl-DHirā' Archaeological Project).

flint source 0.1km southeast of the structure. The assemblage attests to core preparation and reduction, as well as tool production occurring at Al KHayrān. Excavations returned twenty bidirectional cores and 10 hammer stones. Production waste includes significant quantities of flakes and blades, core, pressure flakes, shatter, burinations, and platform and façade production and maintenance debitage. The formal and informal tools show that many of the know types associated with the PPNB were utilized at Al KHayrān, including points and perforators (awls, drills, borers, *etc.*) (Gopher 1994; Shea 2013). All formal tools were made on blade blanks (Fig. 3).

As noted above, the technological and typological analysis of the knapped stone



3. Example knapped stone materials: (A) Bidirectional (naviform) core; (B) Byblos point; (C) Jericho point; (D) Helwan point; (E) Tanged bidirectional blade with use-wear; (F) Drill; (G) Perforator; (H) Burin (Drawings: M. Kroot and S. M. Brazeal; 'Assāl-DHirā' Archaeological Project).

assemblage fits broadly with the dating of Al KHayrān to the PPNB. Eighteen formal knapped stone tools derived from subsurface deposits are of types that are typically seen as chronologically diagnostic within the codified typology of the PPNB. These include elongated knives (Byblos, Jericho, Nahal Hemar, and related types) and projectile points (Byblos, Jericho, Helwan, and related types) (Shea 2013). Additionally, all excavated cores were the product of bidirectional reduction techniques, which is dated to the PPNB within the southern Levant (Quintero and Wilke 1995).

Ground Stone

Ten ground- stone objects were identified at the site. Those deriving from refuse deposits include fragments of two pestles, a shaft straightener, and a quern. A broken double hand stone was incorporated into the wall of the later phase of the structure. A sandstone pillow-shaped piece (Hermansen and Gebel 1996) was found lying flat on the floor of the later phase in a cache alongside two hammer stones. A cache associated with the early phase floor included a flat sandstone disk (Gebel 2010; Gebel *et al.* 1997; Rosenberg *et al.* 2008), a mass of ground red ochre, and dozens of bidirectional blades and blade-based tools. A complete single hand stone was found lying directly on the floor of the earlier phase. As noted above, two ground stone features were also incorporated into the floor of the earlier phase of the structure.

Small Finds

Three shell beads, one made of a bivalve, one from a conical shell, and one from mother of pearl, were recovered from refuse deposits. The bivalve shell was ground smooth and pierced at the umbo. The conical shell was ground smooth and pierced at the apex. The mother- of- pearl ornament is a disc bead, pierced in the center. Additionally, the above-mentioned rounded mass of ground ochre was recovered from the floor of the earlier phase. It was likely originally held within a container, which subsequently disintegrated.

Discussion and Future Directions

The preceding has been primarily a description of the methods of and preliminary results

from investigations at the early Neolithic site of Al KHayrān. However, some discussion of results is warranted due to the potentially unique nature of the site. The remains from Al KHayrān attest to a number of different behaviors by the site's Neolithic inhabitants. There is evidence of subsistence production, on-site knapped stone production, and significant investment in residential architecture. All of these practices are among the most common identified at early Neolithic settlements throughout the southern Levant. However, there are some unique aspects to Al KHayrān, the most obvious being that only a single, yet substantially built, structure has been identified at the site. This is despite an intensive program of surface collection, test excavations, and broad horizontal excavation trenches. This makes understanding the behavioral dimensions of the occupation at the site potentially quite informative for its interpretation.

Future analyses will focus on understanding the broader regional context of Al KHayrān in relation to other early Neolithic settlements and natural resources. They will also be directed towards further investigation of the details of stone- knapping and subsistence production behavior on- site, as well as the spatial and temporal dimensions associated with the habitation of the site. Not only is the structure of Al KHayrān potentially unique, but so is the way that the residential and economic practices enacted at the site integrated within the broader settlement systems in which they were embedded.

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UMM AL BIGHĀL EARLY BRONZE IV TOMBS ANALYSES OF THE HUMAN BONES

Abdalla Jamil Nabulsi and Adeib Abu Shmais

ملخص باللغة العربية

الساق ربما كانت تعود إلى عدوى مزمنة (شكل 8) وجزء من حالة إصابة (كسر) شديدة في الجمجمة كانت قد التحمت قبل الوفاة.

تعود الأسنان التي شملت بالدراسة إلى 14 بالغاً و4 أطفال، وقد أظهر كل من تعدى عمره 18 سنة حالة تسوس واحدة مؤكدة على الأقل فيما بلغ إجمالي الحالات 23% من كل الأسنان، تركز أغلبها في الأضراس. كما أظهرت 24% من الأسنان اهتراءات أفقية بفعل عملية المضغ تزايدت حدتها مع تقدم الأفراد في العمر، وظهرت على فكوك أغلب المتقدمين بالعمر التهابات وفقدان أسنان (جدول 6، شكل 5). يشير وضع الأسنان هذا إلى تنوع غذائي احتوى على نسبة عالية من النشويات والسكريات (فواكه وخبز) بالإضافة إلى الحبوب. دُعمت فرضية التنوع الغذائي أيضاً بوجود أجزاء من عظام الماشية في بعض القبور، ارتبطت على الأرجح بولائم جنازية، مما يشير إلى شمول الحلقة الغذائية للأشخاص والمجتمع قيد الدراسة على المنتجات الحيوانية، كما إنه يقلل من احتمالية أن النقص الغذائي سبب الحالات المسجلة (5.5% من الأسنان) من اضطرابات نمو الأسنان (linear enamel hypoplasia) ونمو كثيف لفتحات الشعيرات الدموية في سقف حجاج العين (Cribra Orbitalia) في 6 من أصل 12 حالة (شكل 6) والتي كانت على الأغلب نتيجة ظروف قاسية كأضرار الطفولة المبكرة.

التشابه في الظواهر الصحية التي أظهرتها هذه العينة المحدودة مع مجتمعات زراعية من فترات لاحقة من نفس المنطقة، والفروقات عما نشر من موقع باب الذراع المتزامن مع عينتنا قد يعلل بالاختلافات البيئية بين المرتفعات الشرقية ووادي الأردن، والتي لا زالت موجودة حتى الآن. إضافةً إلى ذلك، يشير التشابه في أشكال وأحجام القبور وما وجد فيها إلى عدم وجود اختلافات اجتماعية بين المدفونين، كما أن العثور على آلاف قطع الخرز المرجاني الملون في العديد من قبور الذكور والإناث قد يكون دليلاً على ثراء نسبي وعلى علاقة تجارية مباشرة أو غير مباشرة مع مجموعات سكانية متزامنة على شواطئ البحر الأحمر أو خليج العقبة على أقرب تحديد.

خلال عامي 1982 و1984 أجرت دائرة الآثار العامة حفريات إنقاذية لمدافن حُجَريّة في تلال منطقة أم البغال (غرب عمان) والتي كان العمل جارياً لإزالتها لحفر خزان مائي مكانها. وقد عثر على 27 مدفنًا رُقمّت من 1 إلى 25 (1982) و30-31 (1984).

أُرخت المدافن إلى العصر البرونزي المبكر الرابع (2300-2000 ق.م) بحسب ما الأواني الفخارية التي عثر عليها فيها. كما انتشلت بعض البقايا العظمية البشرية كانت تكلّست وتلوّنت بسبب الظروف الطبيعية داخل هذه المدافن مما أدى إلى تغطية وتمويه بعض صفاتها قيد البحث (شكل 3). أتت العظام موضوع الدراسة من 15 قبراً فقط من أصل 27. ستة من هذه القبور كانت فردية والبقية لدفينين أو أكثر وتراوح ما تبقى من كل هيكل بين ضرس واحد فقط إلى ربع الهيكل. خلصت الدراسة إلى أن عدد من دُفن في هذه القبور كان بحدود 26 بالغاً (أمكن تحديد 9 إناث و6 ذكور) و8 أطفال أعمارهم بين السنة والعشر سنين (توزيع الجنس والأعمار في جدول 1).

على الرغم من عدم الكشف عن أي موقع سكني يعود إلى الفترة الزمنية المعنية، وضعت الدراسة فرضية أن القبور قيد البحث هي جزء من مساكن أخرى مجاورة تعود إلى مجموعة (أو مجموعات) سكانية زراعية ذات نسبة تزاوج عالية، كما أظهرت الدراسات المخبرية بعض التقارب في قياسات الجمجم وعظام الأطراف، من ذلك استطالة الجمجم ومتوسط طول قتر بحدود 170 ± 5 سم للجنسين، بالإضافة إلى عدد من المتباينات الطبيعية التشريحية (جدول 2). لكن عدد الأفراد ومحدودية العظام المتوفرة لا تعكس ما يكفي من المؤشرات للتقارب الحيوي فيما بينهم (شكل 4).

رُبط التحول الزراعي بتغيرات حيوية وصحية تركت آثارها على العظام، أبرزها ما نسب إلى تغير نوعي وكمي في الغذاء (سوء التغذية!) وتقشي الأمراض المعدية وتردي صحة الأسنان.

لم تمكننا عينة أم البغال من دراسة تغيرات المفاصل بفعل المجهود الجسدي، ولكن لوحظت حالات التهاب على عظام

Introduction

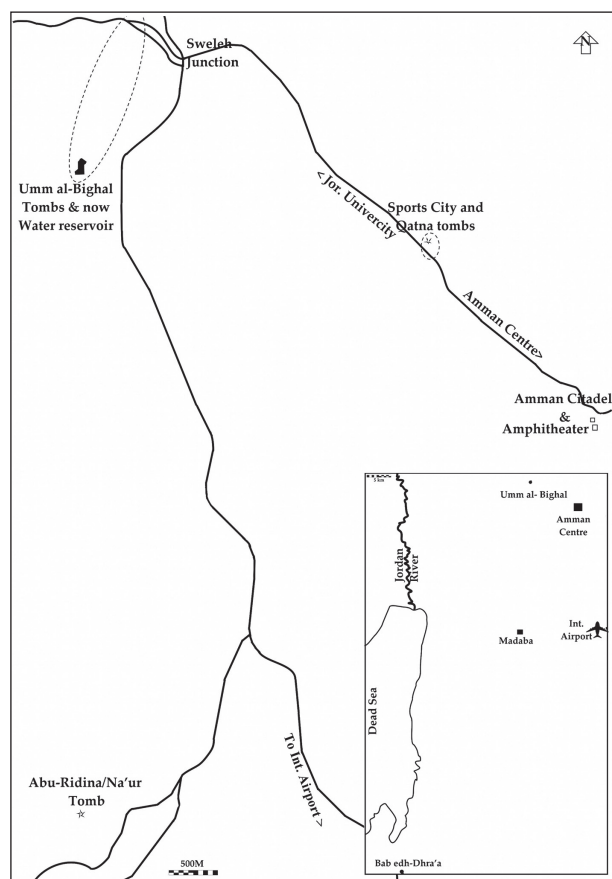
This is the third in a series of reports dedicated and mainly directed to the participants of the 2013 and 2019 “Human Osteology Workshop” held at the Jordanian Department of Antiquities, to provide them with supplementary information and examples.

Human skeletal remains, salvaged during two rescue excavations by the Department of Antiquities (DoA) in the years 1982 and 1984 at Umm Al Bighāl site in the north-western area of Greater ‘Ammān, were provided for osteological analyses. While information about the site and excavations were available for the 1982 season from Helms and McCreery’s (1988) pottery report and the internal DoA report (Registration Office file R7-51 B, 1982 by Hufdy Hadad), no documentation of the later excavation was found. The two above mentioned reports provided essential archaeological background information, particularly concerning the burials and the retrieved human skeletal remains. Accordingly, the 1982 site was a small hill;

about 2km south of Sweleh main juncture (N: 32.0014°750, E: 35.8226°804). On this hill, two clusters of manmade cave tombs were discovered during works to remove the hill and to dig the present Umm Al Bighāl water reservoir in its place (**Fig. 1**). A total of 25 shaft cave tombs, numbered from 1 to 25, hewn in the soft limestone were excavated during the summer of 1982. These tombs were suggested to be part of a cemetery dated to the later Early Bronze Age (EB-IV, *i.e.* 2300-2000BC). The other two cave tombs excavated during 1984 were probably on an adjacent hill to the one already removed. Further similar tombs were observed in the same area, including an EB cave tomb rescue excavated by the DoA in 2006, but many probable others of the same period were either disturbed or destroyed. This suggests the presence of a cemetery along the hills that extended northwards (NNE) towards Sweleh. Numerous tombs of the same architecture and pottery-based dating were discovered prior and after the discovery of Umm Al Bighāl tombs, in relative closeness as well as in different parts within Greater ‘Ammān Municipality as detailed in Helms and McCreery (1988:324), Abu Shmais and Nabulsi (2004:149) and Haron *et al.* (2013:445). So far, no related settlement was reportedly related to any of these sites.

The Skeletal Material

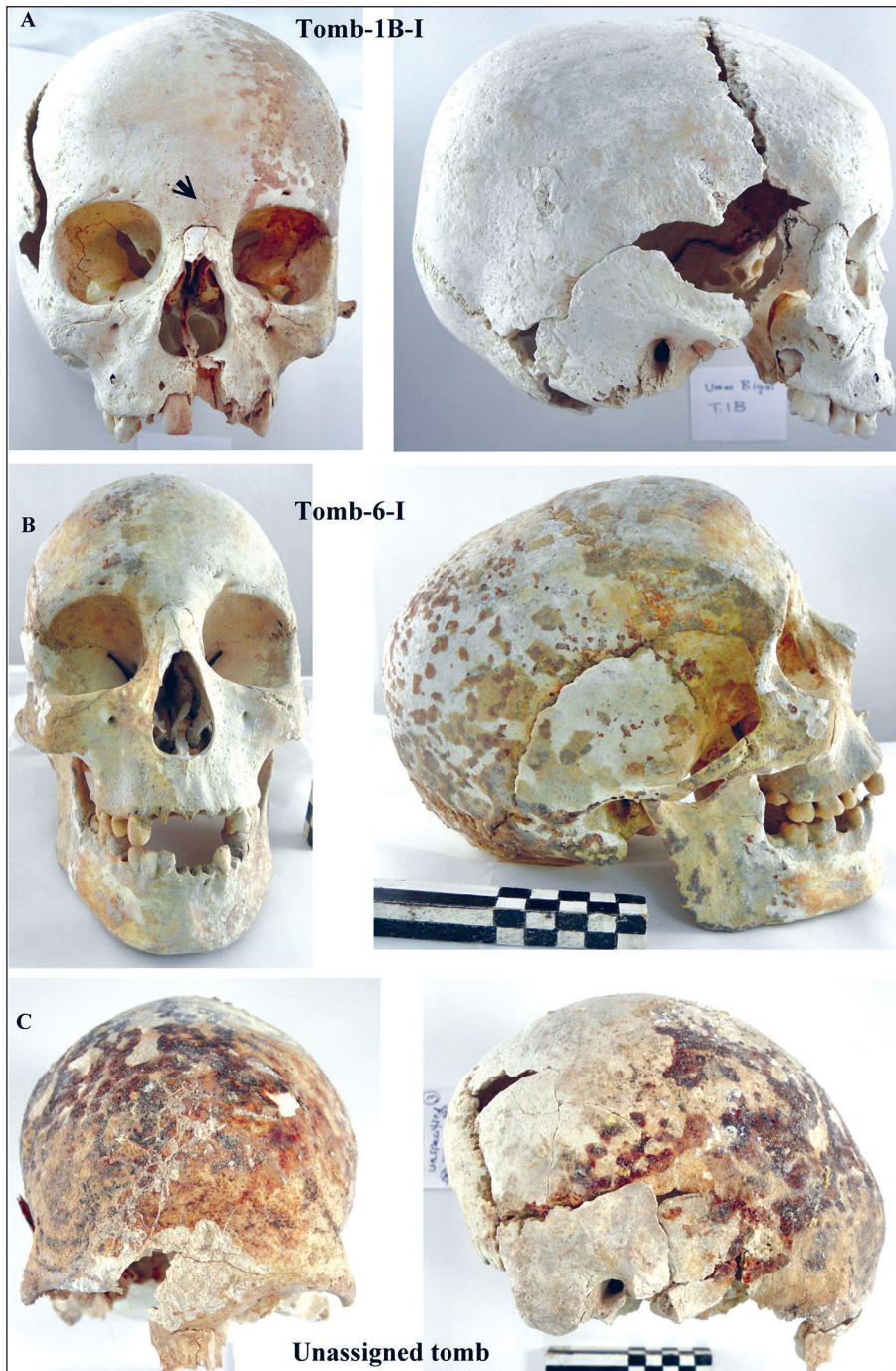
The available Umm Al Bighāl human skeletal remains were retrieved from 13 of the 25 tombs excavated in 1982 and the tombs numbered 30 and 31 from the 1984 season. There were some discrepancies between the available skeletal material and what was expected according to the internal DoA and Helms and McCreery (1988) reports. There were no human bones from Tomb-7 and 20 that were claimed to have some. The available material from Tomb 4 was not from the two chambers (A and B) but from four different and not reported “*loci*” labelled as Tomb-4; 4-Chamber 1; 4-Anti Room, and 4-Insertion. The bones from these *loci* were found to be from different individuals as shown below. Also, three joint bags from the 1982 excavation were not assigned to any tomb. The available skeletal remains from each tomb varied from a single tooth as in Tomb-11 to a single cranium



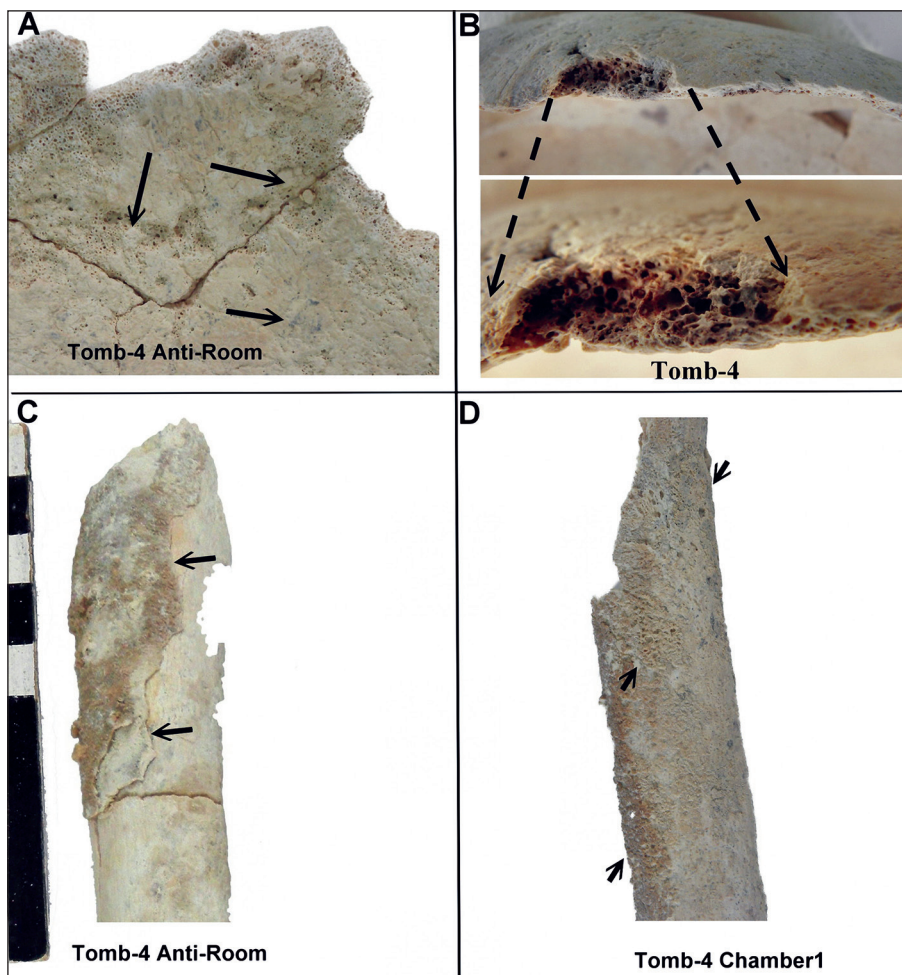
1. Umm Al Bighāl site map and the location of some cited EB-IV sites in ‘Ammān and Jordan. The dotted area mark EB-IV cave tombs concentrations.

from Tomb-1B, to comingled and fragmented bones of multiple burials as in Tomb-23 and 31. Only few post-cranial fragments were available from Tomb-13 that was reported to contain four burials identified by 4 skulls (Helms and McCreery 1988:321-323). The best-preserved burial was represented by less than 25% of the whole skeleton. Hence, there were very few intact bones from all excavated tombs. There was an under representation of the bones from the body's lateral and dorsal parts, particularly

the small hand and feet bones, the pectoral and pelvic bones, and vertebrae. Most bones were covered by a thin icing-like, transparent, and brownish silt layer. Many bones were covered on one side by this silt layer while the other side was covered by a thick white lime layer from the tomb's floor (Figs. 2 and 3). It appears that rain water seeped through the soft limestone and into the cave tombs and thus became water logged and variably covered the burials inside. The rainwater dissolved some components of



2. The best preserved skulls from Umm Al Bighāl burials. The dark dotted and the whitish outer surfaces have probably resulted from silt with clay deposits and limestone floors (age and sex in Table 1). Arrow on Tomb-1B child skull shows position of the supranasal suture.



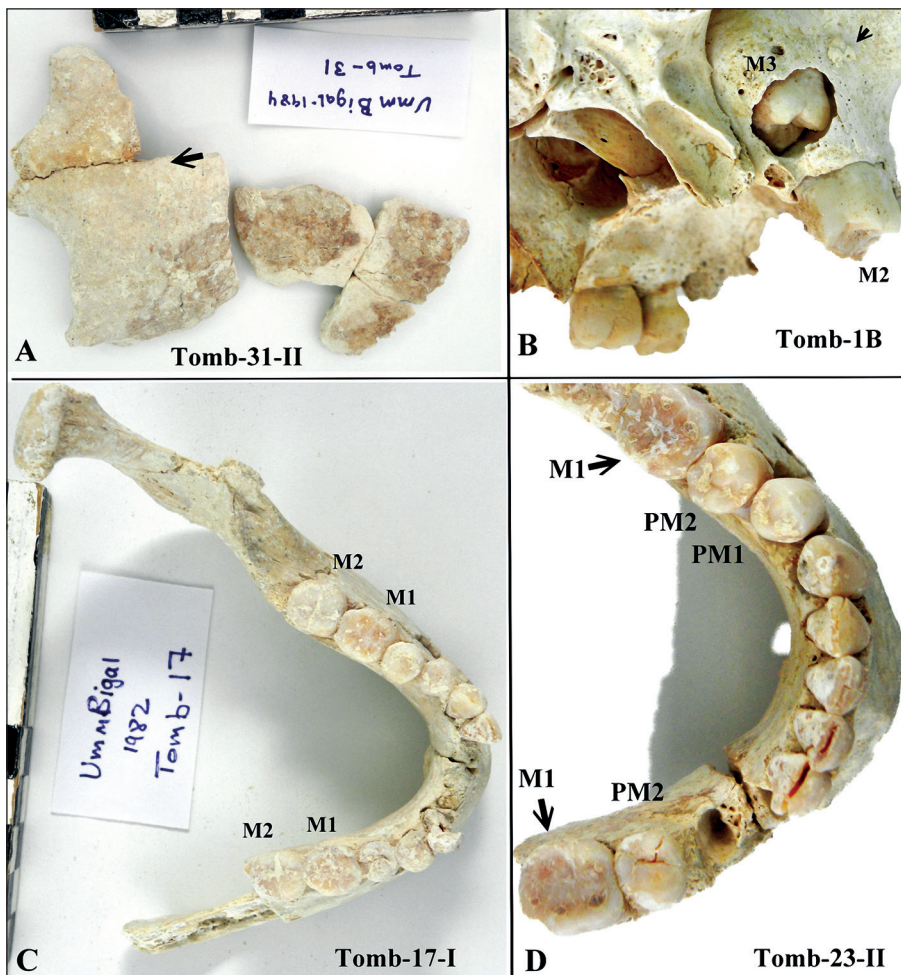
3. Changes to the bone that resulted from burial conditions in Umm Al Bighāl cave tombs: A) Erosion of the internal cranial surface looks like inflammatory reaction; B) Colouration caused by iron compounds in the clay deposits appears like a haematoma; C) Left femur distal shaft end covered with two silting layers (arrows); D) Silt deposits appear like inflammatory lesions on one tibia shaft.

the limestone and softened the stone floors. When the water ceded and later dried, the lower skeletal parts “sank” into the floor while the upper surfaces were covered by the precipitated salts that formed the silt layer, as also observed elsewhere (comp. Nigro *et al.* 2017:226). Some bones indicated multiple silt layers, which might be caused by variably wet seasons over a period. Many bones revealed dark brown spots that were most likely caused by iron oxides in the scattered clay deposits on the bones’ outer surfaces which later diffused into the bone (Fig. 3). The described burial conditions have resulted in the loss or deterioration of skeletal material. In some cases, the silting hampered the analysis of bone surfaces, since the forced removal of this layer would have damaged the bone itself. However, some significant bones, *e.g.* skulls, were better preserved than in numerous contemporary and later cave tombs from the ‘Ammān area. The state of the bone material was a clear indication of the difficulties

that faced the excavators in their efforts to recover the burials.

Analyses of the Human Bones

Human bones were available from 15 of the 27 excavated tombs in the 1982 and 1984 seasons. Added to these is the material not allocated to any tomb and hence treated separately as “Unassigned”. Depending on the available skeletal parts, dentition, cranial and pelvic features were used to determine sex and estimate age at death according to methods described by Lovejoy (1985), Silvassy (1988), and Sjøvold (1988). Sub-adult age estimations were based on teeth eruption (also Alqahtani *et al.* 2010), while epiphyseal fusion and cortex thickness were further indicators of adulthood. Bones in nine of the 15 tombs were assigned to more than one burial, often an adult with a child (Table 1). The remaining 6 tombs were single adult burials. Tombs with more than one chamber could include single or multiple



4. Some of the observed anatomic (epigenetic) variants in the examined human bones: A) metopic suture on the frontal bone of an over 50 years old female; B) exostosis on the child's outer maxillary surface at the level of the not yet erupted M3; C) non-erupted mandibular M3 of a 21-25y female (the left M1 as in D); D) bilateral, mandibular 5 cusps M1 of a 20-30y female with light carious lesions on the right M1 (the mild dental wear was excluded from the analyses in Table 6).

burials in each, e.g. Tomb-1 and 4. The material from the excavated tombs was estimated to be from at least 34 individuals, including the "Unassigned". There were 26 adults, of whom 6 were identified as males and 9 as females. The scanty bones did not allow inferring on the sex or age at death in eight, mostly single, adult burials. Nine adults were estimated to have died between the age of 18 to 30 years and five were beyond 50 years of age. Among the eight sub-adults there was one child, probably a girl, who died 1-3 years old. All remaining seven children, two of whom were probable females, were 5-10 years old. There were neither infants (0-1 year) nor juveniles (11-17 years) among the examined burials. While infant fragile bone material might have deteriorated and 'vanished', it is most likely that the absence of juvenile burials and missing male children was circumstantial and random. The data suggested that two thirds of births survived to contribute to the population fertility and only about 20%

were able to reach a mature age of above 50 years.

Osteometric measurements were carried out on the available bones according to Martin and Saller's revised terminology and methods (Bräuer 1988). The intention for this report is to provide as much as possible of the obtained data from Umm Al Bighāl burials, hence the inclusion of the craniometrics of the girl of Tomb-1B (Table 2; Fig. 2), despite development related values, e.g. the skull length (no.5); upper facial (48) and nose (55) heights. Data from adult skulls varied according to their availability. Three revealed elongated (dolichocephal) skulls. The medium rounded (mesocephal) skull of the child was probably related to an artificial light deformation of the parietal bones. Indications of sexual dimorphism were more evident in the post-cranial measurements of the available intact (Table 3) and fragmented long bones (Table 4). The length values of 3 radii and 2 ulnae showed

slight differences that were also reflected in the estimated statures (methods in Rösing 1988) between 165 and -175 cm for the adult female and two males. Most of the diameter values were lower in female bones than those of males. The highest female values of few a measurements, particularly of the humerus and tibia, were equal or lower than the lowest male value (**Table 4**). Furthermore, adult bones of unknown sex appeared to be within those of identified males. This might compensate for the sex ratio-imbalance mentioned above. Also, it was observed that the femoral head diameter did not exceed 43 mm in four femora from both sexes.

Table 1: The demographic data of Umm Al Bighāl tombs with the estimated number of burials in each. Age, and sex were based on the available skeletal remains from each tomb.

Tomb	Burials Found	No.
Tomb-1A	Adult 17-20y	1
Tomb-1B	Child female 8-10y	1
Tomb-2	Adult	1
Tomb-3	Adult	1
Tomb-4	Male 50-60y	1
Tomb-4 Intersection	Child, possible female, 1-3y; adult	2
Tomb-4 Anti-room	Female 60-70y	1
Tomb-4 Chamber1	Child, 5-10y; adult	2
Tomb-6	Male 18-21y	1
Tomb-11	Adult	1
Tomb-12	Adult	1
Tomb-13	Adult	1
Tomb-16	Female 18-21y; Child, 7-10y	2
Tomb-17	Female 20-25y; adult, 25-45y	2
Tomb-18	Possible female 25-35y	1
Tomb-23	Male 55-65y; female 20-30y	2
Tomb-25	Child 5-7y; Child 7-10y	2
Tomb-30	Child, possibly female 5-7y; female >50y; possible male >21y	3
Tomb-31	Female 20-30y; 2 males 20-30y; possible female >50y; child 5-7y	5*
Unassigned ¹	Female >45y; possible male 20-30y; adult	3*

1. Material from 3 bags labelled as from the 1982 season.
* Number based on different adult mandibular parts.

Table 2: Measurements (in mm) of the available crania from Umm Al Bighāl tombs.

Tomb	T6	T17-I	T-23-I	T1-B	Unassigned
Measurement	♂, 18-21y	♀, 20-25y	♂, 55-65y	8-10y, ♀	♂, 45-55y
1) g-op	183	179	183	179	189
(2) g-i	176	171	182	166	174
(2a) n-i	181	166	176	156	167
(3) g-l	181	172	178	175	182
(5) n-ba	103	96		86	
(7) ba-o	36	38		37	
(8) eu-eu	134	128		141	134
(9) ft-ft	98	93		94	90
(10) co-co	110			110	112
(11) au-au	118	106		106	116
(12) ast-ast	109	100		96	110
(13) ms-ms				96	101
(16) Foramen magnum br.	30	32		27	
(17) ba-b	134	123			
(18) ba-vertex	134	126			
(25) n-o	380	364			392
(29)n-b	118	105	109		110
(30) b-l	117	111	115	112	121
(31) l-o	100	95		98	
(40) ba-pr	93				
(43) fmt-fmt	102	97		85	
(44) ek-ek	94				
(45) zy-zy	130				
(45-3) zo-zo	49				
(47) n-gn	125				
(48) n-pr	75			50	
(54) Nasal breadth	22			21	
(55) n-ns	55			39	
(65) kdl-kdl	113				
(66) go-go	103				
(67) ml-ml	47	42			
(69) id-gn	34	26			34

(70) Mandibular height	60	56			60
(70a) Ramus height	62	71			64
(71) Ramus breadth	35	31			31
(I1) Cranial index	73.22	71.51		78.77	70.10
(I13) Frontoparietal index	73.13	72.66		66.67	67.16
(I3) Cranial transverse I.	100	96.09			
(I38) Facial index	96.15				

Table 3: Measurements fro of the intact radii and ulnae in mm. Stature estimations as in Rösing (1988:597).

Tomb	Tomb-4 Ins. Adult, ♂?	Tomb-6 ♂, 18- 21y	Tomb-17 ♀, 20- 25y
Measurement	R/L	R/L	R/L
Radius			
(1) Maximum length	244/-	239/-	237/-
(2) Physiological length	235/-	231/-	227/-
(4) Max. transverse shaft diameter	19/-	14/13	15/-
(4-1) Transverse head diameter	19/-	21/19	18/-
(4-2) Transverse neck diameter	13/-	12/12	12/-
(5) Min. sagittal shaft diameter	13/-	10/10	11/-
(5-6) Distal epiphysis breadth	31/-	26/-	27/-
Ulna			
(1) Maximum length		257/-	
(2) Physiological length		221/-	228/-
(6) Olecranon breadth		21/20	18/-
(11) Doso-ventral shaft diameter		20/18	14/-
(12) Transverse Shaft diameter		13/12	11/-
Stature estimation	1697.4±50	1678.0±50	1672.4±42

Table 4: The diameter measurements of incomplete adult long bones shafts in mm. n: total number of available bone (R and L); Ø: diameter.

Measurement by sex	n	Male min- max	Female min- max	Unknown min- max
Humerus				
(3) Proximal epiphysis breadth	1		46	
(5) Maximum mid-shaft Ø	13	23-26	17-22	20-22
(6) Minimum mid-shaft Ø	13	18-22	15-16	16-19
(9) Transverse head Ø	1		36	
(10) Longitudinal head Ø	1		38	
Ulna				
(11) Doso-ventral shaft Ø	7	17-18	13	16
(12) Transverse Shaft Ø	7	13-14	11-12	13-14
Femor				
(6) Ant-post. mid-shaft Ø	17	29-32	24-29	27-28
(7) Median lateral mid-shaft Ø	15	22-29	21-25	23-24
(8) Mid-shaft circumference	16	83-97	77-89	85-86
(15) Vertical neck Ø	1	31		
(16) Anterior-posterior neck Ø	2	26-29		
(19) Transverse head Ø	4	41-43	43	
Tibia				
(8) Mid-shaft sagittal Ø	13	29-33	25-27	26-29
(8a) Mid-shaft sagittal Ø (for nut)	13	20-22	16-21	19-20
(9) Transverse mid-shaft Ø	9	21-25	18-23	21-22
(9a) Transv. mid-shaft Ø (for nut)	9	34-41	27-32	30-33

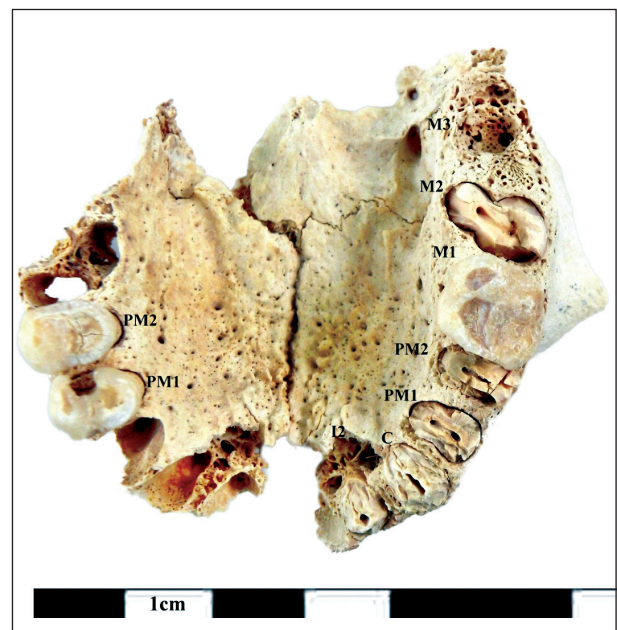
The presence and absence of a number of epigenetic, normal anatomic, variants were documented (as described in Berry and Berry 1967; Hauser and de Stefano 1986) on the variably available cranial parts from Umm Al Bighāl tombs (**Table 5, Fig. 4**). The data revealed a general presence of some traits, *e.g.* supraorbital notch or foramen, occipital foramen, and lambdoid ossicles, and the total absence of a few others, *e.g.* sutura mendosa and ossicle at lambda as well as the non-listed

Table-5: The documented cranial epigenetic (anatomic) variants. T: tomb; trait present or absent on either side; ?: not verifiable; 1: foramen or notch; 2: Total number of observations at any side including the not listed individuals.

Individual Variant	T-1B	T-4	T-4AR	T-6	T-16	T-17 I	T-23 I	T-31 I	T-31 II	Unas- signed	Totals ²
Metopic Suture	-	-		-	-	-	-	-	+	-	1/11
Supranasal suture	+	+		+	-	-	-	-	-	-	3/11
Supraorbital troclear str. ¹	-/-	-/+		-/+	-/-	-	?/-	-/?	-/-	?/+	3/11
Supraorbital median str. ¹	+2/+	+ /+		-/+2	+/?	+/+	?/-	+/?	+/+	?/+	9/11
Infraorbital foramen	+/+			+/+						+/?	3/3
Foramen zygomatico-faciale	+/+			+/-							2/2
Parietal foramen	-/-	+/+	?/+	+/-	+/+	-/-	+/-	+/-		?/+	7/9
Lambdoid ossicle	+/+	-		-/+2	+/?	-/-	+/?	?/+		-	5/8
Osscle at lambda	-	-		-	-	-	-	-		-	0/8
Ossicle at astrion	-/-	-		-/+		-		-/?		-	2/6
Sutura mendosa	-/-	-		-	-	-	-/-	-		-	0/8
Occipital foramen	+	+	+	+	+	+	+	+		+	9/9
Canalis condylaris	+/+			+/+		-/-					2/3
Facies condylaris bipartita	+/+			-/-		?/-					1/3
Canalis hypoglossalis	-/-			-/+t		+/-					2/3
Suprameatal spine	-/-	?/+	+/-	+/+	+/?	-/-	?/+	-/?		+/+	7/10
Suprameatal depression	-/-	?/+	-/-	-/-	-/?	-/-	+/+	-/?		-/-	3/10
Mastoid foramen	?/+	?/+		-/+	?/+		?/+	+/?		+/+	7/7
Squamomastoid suture	+/+	?/+	-/+	+/+	?/+		?/+			-/-	6/8
Adult 3rd molar non-eruption				-	+	+	-			+1/-2	3/9
M1 with 5 cusps	-			-		-	-	+		-	3/11

auditory exostosis. The manifestation of other traits varied within the examined cranial parts and included some interesting observations. The absence of parietal foramen, adult non-eruption of the third molar (M3) with at least one on both jaws, M1 with 5 cusps, supranasal suture were documented thrice in different individuals, while there was only a single metopic suture case. Tomb-1B child skull revealed a 2×3 mm bone outgrowth (exostosis) on the outer maxillary surface at the level of the not yet erupted right M3 (**Fig. 4B**), though a pathological background cannot be excluded. As for the post cranial epigenetic traits (s. Fennigan 1978), it was only possible to observe a single septal aperture in 5 intact distal humeral ends and a division of the right upper articulation facet of the singular atlas (1st cervical vertebra).

Teeth available from only 14 adults and 4 children were examined for pathological features. Observations were restricted to 217 permanent teeth. These included detached ones. Excluded were 5 deciduous teeth with no obvious pathology. Available upper jaw



5. The dental pathologies as manifested on the maxilla of a 35-45y (possibly male) from an "Unassigned" tomb. The maxilla reveals medium strong wear on both left PMs and strong on the right M1, carious lesions on the left PM1 and lighter on the right M1. The right M3 position reveals a healed socket after the pre-mortem loss as a result of an abscess. The remaining teeth were post-mortem lost (on the left) or damaged (on the right), before and during excavations.

Table 6: Dental pathology of the Um al Bighal tombs: M: molars; PM: premolars; I: incisors; C: canines; C/H/W: caries/enamel hypoplasia/medium to strong wear; LJ: lower jaw, UJ: upper jaw; ?: unverifiable; +: present, -: not observed; *: only the number of individuals was counted.

Burial	Age and sex	M	PM	I	C	Tooth loss		Abscess	
		n (C/H/W)	n (C/H/W)	n (C/H/W)	n (C/H/W)	LJ	UJ	LJ	UJ
T-1B	8-10y female	4 (0/0/1)	1 (0/0/1)	1 (0/1/0)					
T-4	50-60y male						3		1
T-6	18-21y male	11 (1/0/0)	4 (0/0/0)	1 (0/0/0)	3 (0/1/0)	-	-	-	-
T-11	Adult			1 (0/1/0)					
T-16	7-10y child	6 (0/0/0)	4 (0/0/0)	3 (0/0/0)	2 (0/0/0)				
T-16	18-21y female	3 (2/0/0)	4 (1/0/0)	4 (0/2/0)	3 (0/1/0)		-		-
T-17-I	20-25y female	8 (2/0/0)	6 (0/0/0)	1(0/0/0)	3 (0/0/0)	-	-	-	-
T-17-II	25-45y adult	3 (2/0/3)	2 (2/0/2)	2 (0/0/0)	2 (0/0/1)	?		?	
T-18	25-35y female	4 (2/0/1)	2 (0/0/0)	7 (0/1/0)	2 (0/0/0)	?		?	
T-23-I	55-65y male	6 (3/0/6)	1 (1/0/1)	1 (0/0/1)	2 (0/0/2)	?		?	
T-23-II	20-30y female	5 (1/0/0)	4 (0/0/0)	4 (0/0/0)	2 (0/0/0)	-		-	
T-25	5-7y child	4 (0/0/0)	3 (0/0/0)		-	-		-	
T-30-I	>50y female	7 (5/0/7)	4 (2/0/4)	1 (0/1/0)	3 (0/0/3)	2		-	
T31-I	20-30y female	8 (3/0/0)		1 (0/0/0)	2 (0/0/0)	-	-	-	-
T31-II	>50y female	3 (1/0/2)			1 (0/0/1)	1	-	1	-
T-31-III	30-45 adult	2 (1/0/1)				2		1	
T31-IV	20-30y male	1 (0/0/0)				-		-	
T-31-II to IV	loose teeth of 3 adults	7 (4/0/2)	4 (1/0/1)	6 (0/1/2)	4 (0/1/2)				
T-31-V	5-7y child	2 (0/0/0)	1 (0/0/0)						
Unassigned	20-30y male & >45y female	13(9/0/4)	9 (6/0/5)	6 (0/1/0)	7 (1/1/0)	-	1	-	1
Totals		94 (36/0/27)	49 (13/0/14)	38 (0/8/3)	36 (1/4/8)	3/12*	2/7*	2/11*	2/7*

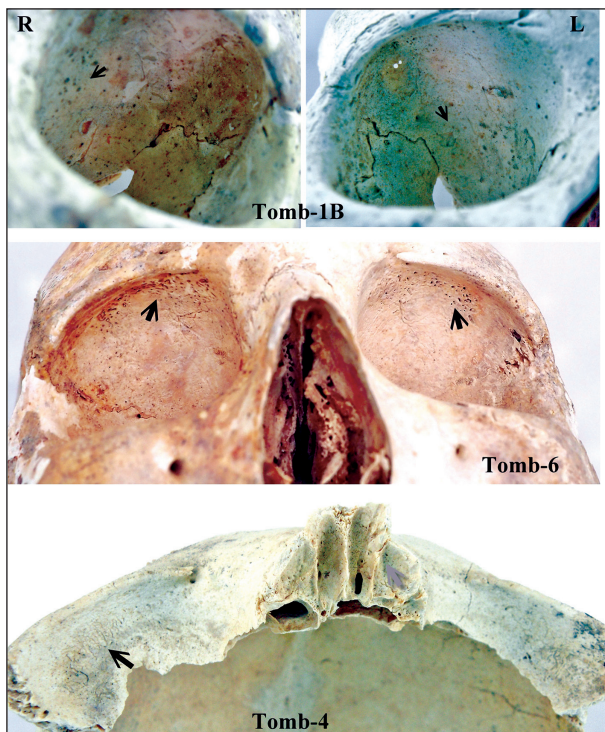
(maxillary) and lower jaw (mandibular) parts were also included (**Table 6, Fig. 5**). Well recognizable carious lesions ($\geq$ grade III as in Schultz 1988:494) have developed on teeth of 13 if not all 14 adults but none on those of sub-adults. The lesions were observed on 23% of all permanent teeth and with one exception on 34% of all molars and premolars. Medium to strong dental (horizontal) attrition ($\geq$ grade 5 as in Smith 1984) was observed in 24% of all teeth, mostly on molars and premolars of older adult (>30 years) who also exhibited carious lesions (**Fig. 5**). Only 5.5% of all teeth revealed linear enamel hypoplasia (LEH). These were restricted to 16.2% of all 84 incisors and canines. LEH was observed on 7 of 18 individuals of different age groups, including Tomb-1B child. Pre-mortem tooth loss was observed in 5 of 12 adults; while abscesses were only found in 3 of these five cases. These conditions appeared to be restricted to teeth, molar in particular, of above 45 years old adults, *i.e.* age related (**Table 6**).

Furthermore, dental calculus deposits were suspected in eleven of 16 adult burials.

Silt coating, lime and clay deposits have masked and even “imitated” pathological features on the excavated human bones (**Fig. 3**), including dental pathologies. From a total of 12 individuals, cribra orbitalia (CO) was diagnosed on the orbital roofs of Tomb-1B child burial and 5 adults from Tomb-4, 6, 16, 18, and one of the “Unassigned” (see **Table 1** for age and sex; **Fig. 6**). In 2 cases only one side was available while the manifestation was restricted to the left orbit of the “Unassigned” case. The CO observed in Tomb-4 and 16 burials revealed what appeared to be “vascularization”, orbital roofs with furrowed surfaces (**Fig. 6C**) similar to that described and cited in Braun (2005:48). The manifestation of CO was medium strong (=Grade II in Schultz 1988:490) in Tomb-6 adult and light (Grade I) in the remaining five individuals. In addition, Tomb-1B child and two adults were diagnosed with CO as well as

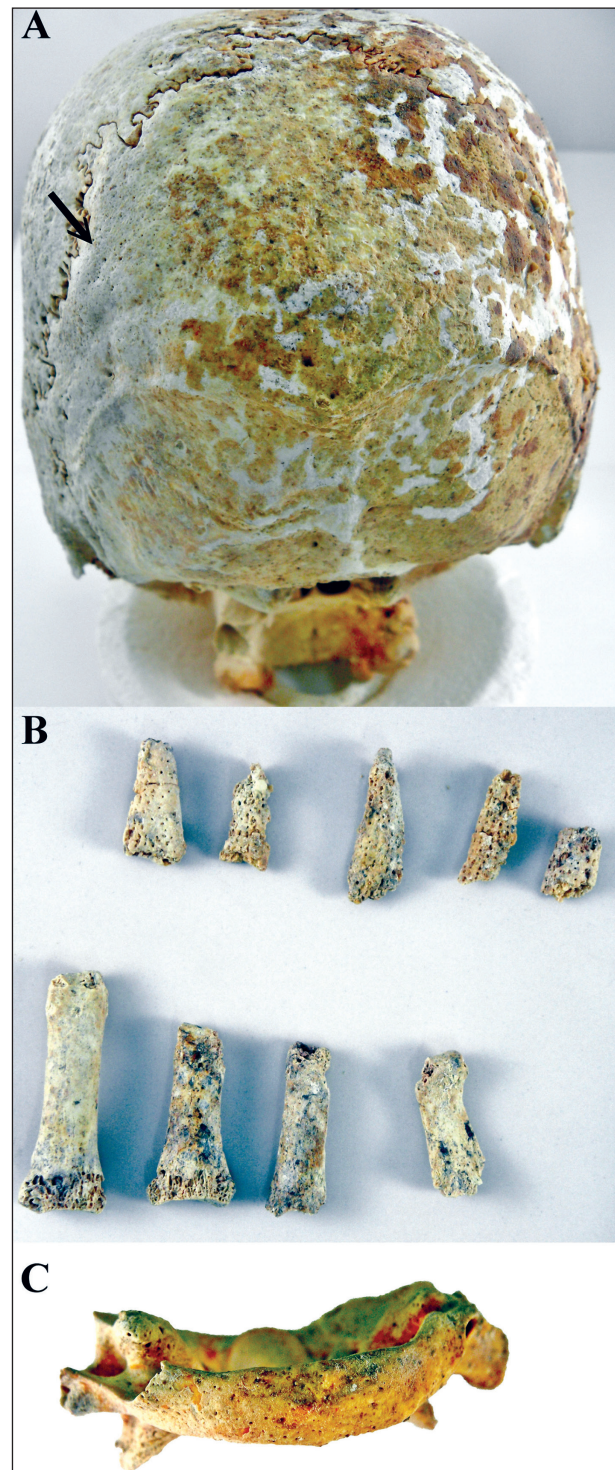
LEH. Most crania revealed light porosity on the outer surfaces (*lamina externa*) of the frontal and parietal bones. The obvious “normal” skull thickness indicated that these were definitely not cases of porotic hyperostosis but most probably resulted from inflammation associated with parasitic head lice (comp. Capasso 2007). Porosity around the auditory (ear) canal on the temporal bone was frequently observed. The condition might be related to common ear infection. In Tomb-6, the cranial porosity extended with more severity to the left side of the occipital bone but the cause was undeterminable. Porosity was also observed on his atlas vertebra, and particularly on the middle bones and phalanges of the right hand (Fig. 7). The shape of these phalanges was a reminder of a specific pathologic condition (comp. Robert and Manchester 1995:145, fig. 7.12). Yet there were no other pathological features to support such a possibility and bone erosion was the most likely cause.

The near absence of articulation surfaces



6. The variable manifestation of bilateral Cribra orbitalia (black arrows) among the buried from Umm Al Bighāl: mild in Tomb-1B child burial, medium-strong in the 18-21 male burial from Tomb-6, and a case of “vascularisation” (arrow) with light porosity in a 50-60 years old male of Tomb-4 (the grey arrow points to the inflammation (porosity) of the nasal cavities of this individual).

on the post-cranial bones prevented providing any information on the extent of degenerative alterations in this sample. Few cases of inflammatory reactions were observed on the skeletal surfaces. These included a case of

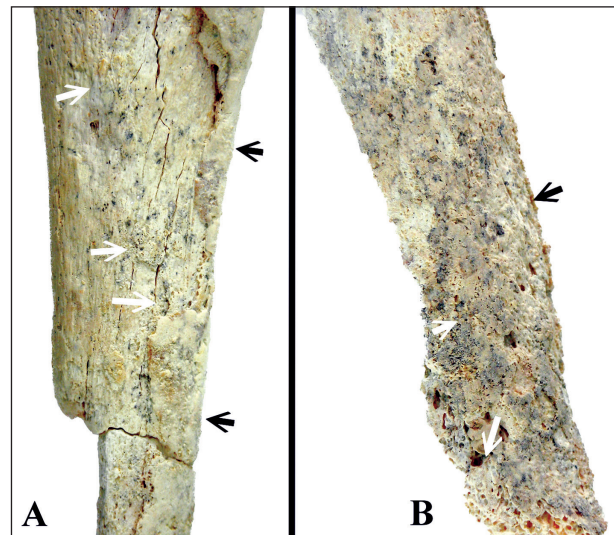


7. The case of the 18-21 years old male from Tomb-6: A) marked porosity on the left site of the occipital bone and (B) phalanges of the right hand; C) possibly on the silt-coated vertebral arch of the atlas (on this individual see also Fig. 6).

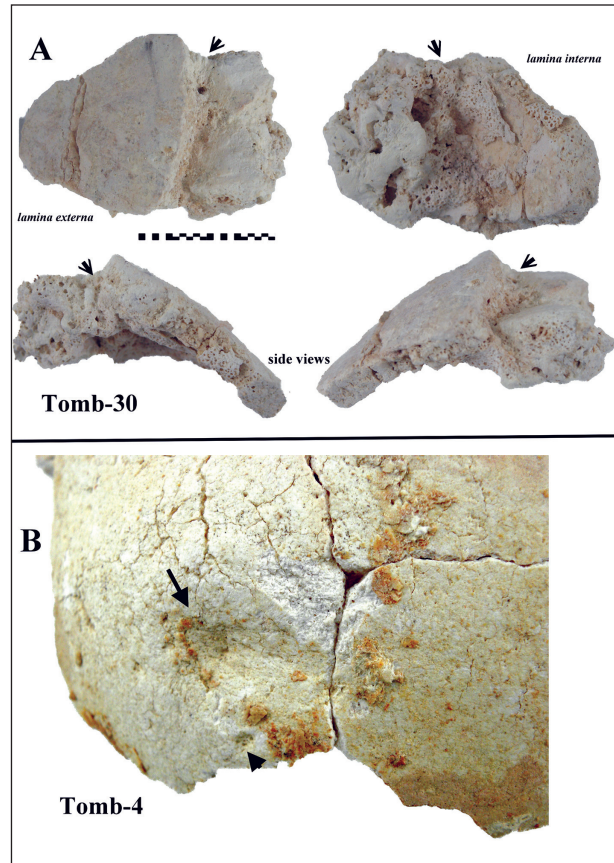
sinusitis (nasal cavities inflammation) in Tomb-4 burial and possible cases of inflammatory lesions on the left and right tibia fragments of Tomb-4-Anti-Room and Chamber1 burials respectively (**Fig. 8**). Three traumatic injuries were diagnosed on skulls of three individuals. Two of these were healed compression fractures. The first one (*ca.* 20 mm diameter) was on the lateral left parietal from the 50-60 years old male in Tomb-4 and the second (*ca.* 7 mm diameter) was inflicted laterally on the right parietal of the 20-25y female (Individual I) of Tomb-17. Both injuries were apparently caused by a solid and blunt object (stone?). The third case was a more severe traumatic injury observed on fragments of an adult skull from Tomb-30. A parietal bone fragment (*ca.* 45×30 mm, side not determinable) revealed part of a healed fracture that probably ran parallel to the sagittal suture. Along the fracture line, the parietal bone was pressed inwards. The two parts were later fused by the irregular bone formation of the callus, *i.e.* the healing process (**Fig. 9A**). The individual must have survived his injury for a time long enough to build the callus. The bone fragment presented only a part of the injury and it is thus not possible to make any suggestion on its causality. The observed erosion on the *lamina interna* of other possibly related cranial fragments was similar to erosions observed in many other burials so that they could only be related to environmental factors, *i.e.* burial conditions.

Other Findings

In addition to those documented in the excavation reports, further different objects were found with the human skeletal material of Umm Al Bighāl tombs. Among the bones were a number of pottery fragments from diverse vessels and quatrefoil lamps, of which one was nearly complete. The pottery was obviously not included in Helms and McCreery (1988) published inventory. Animal bones and teeth, probably of sheep or goats, were among the material from Tomb-17, 31, and the “Unassigned” (**Fig. 10**). Also found were a few bronze fragments, including thin plates and small rods of small and variable size (20 mm and less) from unverifiable objects. A piece of wood, about 10×7×3cm size, obviously from



8. Inflammatory lesions (white arrows) on the R tibia of a 60-70 years old female from Tomb-4 Anti Room and the left tibia of another adult, possible female, from Tomb-4 Insertion (black arrows indicate the lime and silt coating in both bones).



9. Cranial traumatic injuries: A) Healed traumatic injury on the parietal bone of an adult from Tomb-30 (sex not verifiable) viewed from the outer and inner cranial surfaces, as well as from both sides, with the “spongy” healing callus joining the two broken ends. B) Compression fracture on the left parietal bone of a 50-60 years old male with smaller depressions (short arrow) on the injury’s margin. Dark spots are remnants of the silt coating.

the stem of a palm tree type, was found in a separate and unlabelled bag with the Tomb-31 material (**Fig. 11B,C**), though its relatively good preservation drew some doubts on its antiquity. The most significant type of objects found was the *thousands* of white, blue, and red (or pink) coral beads from many burials, *e.g.* Tomb-12. It appears that they were used by both sexes as indicated by the find in the single male burial (18-21 years old) from Tomb-6 (**Fig. 11A**). They were sieved from the lime earth that covered the excavated bones and detached from the bones themselves. Doing so, the location of the beads was not documented since it was presumed that this step was

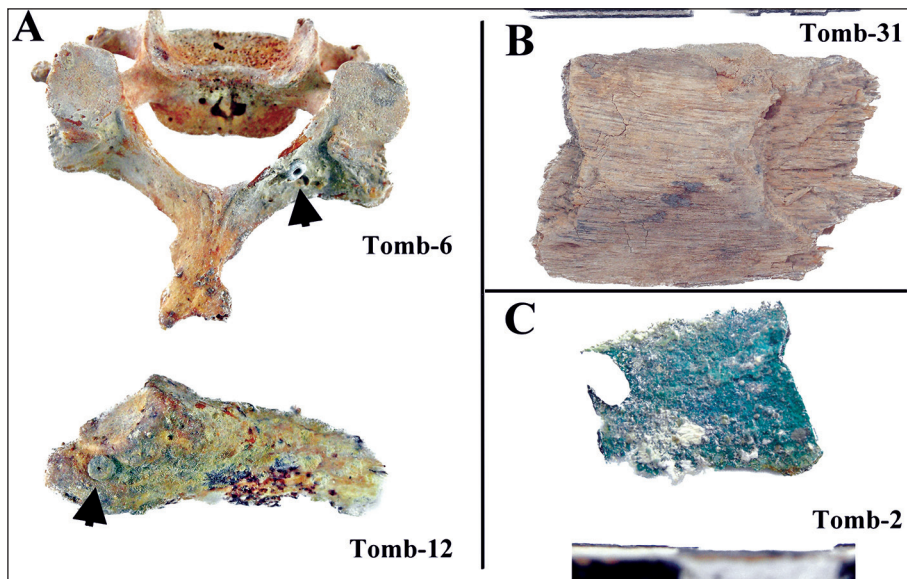
already accomplished by the excavators for this significant find. Unfortunately, they were not mentioned in any report. The beads have an irregular discoid shape, *ca.* 4 mm in diameter and 1mm thickness, with a fine and most probably natural perforation of less than one millimetre. They were apparently joined by a fine string in the form of necklaces and bracelets. It is very probable that the beads were from the Red Sea corals. Beads were often reported in different EB burials of different phases (*e.g.* Rast and Schaub 1980:39; Tubb 1985:119; Philip 2008:49; Nigro *et al.* 2017:228-9), but the material and numbers from Umm Al Bighāl tombs is obviously different and enormous.

Discussion and Conclusion

The obtained data in this report were limited by the limitation of the available material for analyses. The archaeological excavations at Umm Al Bighāl site, NW ‘Ammān, provided some human skeletal material from 17 of 27 late EB cave tombs that were excavated in 1982 and 1984. The material from these tombs was found to be of at least 34 individuals, 26 adults and 8 children with a skewed sex ratio in favour of females. It also did not include any infants nor 11-17 years old juveniles, of whom some could have contributed to the population’s fertility. It is most likely that these observations were random and did not reflect the population’s real demographic parameters. This could also be the case for the lower mortality among sub-adults and the obviously higher survival rate



10. Identified animal bone and teeth fragments, probably goat or sheep, found with the human bone material from Umm Al Bighāl.



11. Examples of other objects found with the human bones from Umm Al Bighāl burials. A) a blue coral bead attached on the arch of a cervical vertebra of the adult male from Tomb-6 (left top) and a white one (bottom) on a hand phalanx of an adult (sex not known); B: a piece of wood possibly from a palm tree; C) example of a flat bronze fragment from an unknown object.

beyond the age of 50 years than the estimated 11% among the EB burials from Bāb edh-Dhra'a (comp. Ortner and Frohlich 2007:365, Table 6). The excavated tombs were part of a larger field or cemetery of cave tombs, most of which were and couldn't be excavated, as already mentioned in the introduction. The buried belonged, most probably, to a small size community. In a stable population of 100 individuals with a very low (equal modern) mortality rate of 1-2 death per year (at least 3 should be the norm) one can expect 100-200 deaths per century in this population. In the case of Umm Al Bighāl's 27 tombs, one can estimate a total number of 54 or even 60 burials. This number would still represent 10%, or even a fraction, of deaths during the occupation period, *i.e.* later 3rd millennium BC (Helms and McCreery 1988:319, 341). The suggestion to relate the Umm Al Bighāl EB-IV tombs to a small population of a settlement, which is still to be discovered, is in general agreement with Thompson's (1974:70) argument that settlements in eastern Jordan "... can be characterized as that of small village agriculture" (also Philip 2008).

Biologically, small populations tend to be homogenous as a result of endogamy (matings mostly between its members). The small sample size from Umm Al Bighāl burials did not allow proper statistical analyses. Yet, the obtained osteometric data showed tendencies towards elongated skull form, gracile long bones, and a near 170 cm stature for both sexes. Sexual dimorphism was indicated by lower diameters of the long bones and in the cranial circumference. Craniometrics of earlier Near Eastern populations suggested variability between elongated dolichocephal and medium rounded mesocephal skulls (comp. Lahr and Arensburg 1995:90). Comparative data on post-cranial bones are more abundant, though mostly of single or few individuals. These showed that at Umm Al Bighāl, long bones measurements and estimated stature for both sexes were within the reported values from different sites in Jordan of similar dating (Abu Shmais and Nabulsi 2004:153; Ortner and Frohlich 2007:364; Haron *et al.* 2013:444), as well as those from earlier (*e.g.* Rolston 1982; Lahr and Arensburg 1995:92; Loh and Ji

2000:202), and even later periods (*e.g.* Nabulsi and Shami, in press). The reported similarities in the presence or absence of anatomic variants in nearly all examined cranial material might be misleading since the inheritance of some of these is doubted (comp. Bennet 1965; Rösing 1981:107; Hauser and de Stefano 1986). The incidence of supranasal suture, bilateral absence of the parietal foramen, M3 non-eruption, and M1 with 5 cusps were suggested to be rather hereditary with regional variation, *i.e.* not geographic, in their distribution from 0-50% (comp. Irish 2006:532; L'Abbe' *et al.* 2011; McIlvaine *et al.* 2014:240-242; Gangmei *et al.* 2018; Halagatti and Sagar 2018). Though not any two of these traits were simultaneously found in any two individuals, their incidence, on the molars in particular (comp. Alt and Vach 1995:111), might still hint at a possible relatedness between the examined sample and possibly as a result of endogamy. This remains an assumption and not evidence.

The transition of the local population east and west of the Jordan River to small agricultural communities has already taken place prior the Early Bronze Age period (Thompson 1974:65; Philip 2008:165; Ibrahim 2009). It was suggested that agricultural transition had brought growing populations and a number of biological changes that included, among others, an increase in infectious diseases and decline of oral hygiene. These changes were reflected on their skeletal remains in increased incidence, often age and sex related, of generalized inflammations (periostitis), caries, and dental wear (*e.g.* Wood *et al.* 1992; Larsen 1995:187, 198; Roberts and Manchester 1995:16-19, 48-60; Lukacs 2008), and possibly changes in the incidence of degenerative alterations (DA) and traumatic injuries (*e.g.* Ortner 1993:95; Ullinger *et al.* 2012). Though the Umm Al Bighāl cave tombs cannot be associated with any nearby settlement, geography and history suggest that this area was part of the westward extension of the EB agricultural communities in the Greater 'Ammān area (comp. Thompson 1974). The pathologic features might provide some hints concerning this suggestion. The two possible periostitis cases of Tomb-4Anti Room and Chamber provided inconclusive evidence on the extent of infectious diseases while the

recognition of further cases was hampered by the scanty, silt-encapsulated post-cranial bones. The material delivered no information on DA and the observed cranial traumatic injuries could occur in any kind of community. Child mortality in a population is usually attributed to infectious diseases, most of which do not leave their marks on the bones. In the examined sub-adult burials in this study, there was no proof to relate these mortalities with infectious diseases. This included cribra orbitalia (CO) that was only diagnosed in one sub-adult. The porosity of the orbital roof “is instigated by over activity of the red bone marrow” (Hengen 1971:71). CO was/is associated with nutritional, iron, vitamin C and B12 deficiency as well as with infectious diseases, socioeconomic, and hygienic conditions (for further readings and bibliography in Wapler *et al.* 2004; Walker *et al.* 2009; McFadden and Oxenham 2020). Genetic factors were also considered so that CO was listed in at least one report as part of the examined epigenetic traits (Česnys and Tutkuvienė 2007:9). This hereditary aspect might favour considering the six cases of CO in the examined Umm Al Bighāl burials as indicator of relatedness. Yet, one has to consider that different studies on different skeletal samples provided contradicting results, *e.g.* isotope analyses on iron deficiency and CO incidence (comp. Fornaciari *et al.* 1982; Grupe 1995; Schutkowski and Grupe 1997). Hence, CO must be seen as a reaction to an elongated stress situation that lead to anaemic conditions, probably during childhood, caused by single or multiple factors including genetic predisposition. The effect of any given factor might vary from one population to another, and consequently from one individual to another in Umm Al Bighāl’s sample.

Increased incidence of linear enamel hypoplasia (LEH) was also associated with nutritional deficiency and childhood stress, though not always among agricultural societies (Roberts and Manchester 1995:58-61; Krenz-Niedbala and T. Kozłowski 2013). LEH observed in seven burials, including two children, was limited to 16.6% of all available incisors and canines of 19 (37%) individuals. This frequency is intermediary when compared with the prevalence of LEH in other examined

populations, mostly of much later periods in Jordan (Griffin and Donlon 2007; Perry 2007:505, Table 5). Caries and dental tooth wear revealed similar frequencies for their incidence in all teeth (23 and 24% respectively). Both “pathologies” were predominantly manifested on molars and premolars. Caries frequency in Umm Al Bighāl sample was obviously higher than the reported 6.1% and 7.3% in the EBI and EBII-III Bab edh-Dhra’a samples (Ullinger *et al.* 2013:759) and even more frequent than the reported values from Jordan in many agricultural communities of later dates (*e.g.* Albashaireh and Al-Shorman 2010:210). This is also true for the limited data on teeth attrition, abscesses, and tooth loss when compared with those reported in Bab edh-Dhra’a (comp. Ullinger *et al.* 2013:759-762). While caries was associated with the consumption of high carbohydrate food, *e.g.* white bread and figs (Roberts and Manchester 1995; Hillson 2001), dental horizontal wear was connected, among other factors, with the consumption of stone-grounded cereals, hence both associated with the agricultural expansion (Smith 1984; Hillson 2001). Carious lesions and dental wear data suggest that the available Umm Al Bighāl skeletal sample was drawn from an agricultural community with a diverse diet. Therefore, LEH as well as CO in Umm Al Bighāl population could not be related to nutritional deficiencies. It appears that the affected adults survived a stress situation during their childhood and probably contributed to the fertility of their population. The obtained demographic data and observed health conditions among the limited number of burials from Umm Al Bighāl tend to be nearer to those of later agricultural communities that resided on the Eastern Heights and less similar to those of the contemporary EB population of Bab edh-Dhra’a. These could be attributed, at least partly, to differences in altitude and environment between the Eastern Heights and the Jordan Valley.

The suggested nutrition diversity for Umm Al Bighāl material was supported by the sheep or goat bones found in the burials. Though such finds were not common in EB burials (*s.* Hesse and Wapnish 1981; Ilan 2002:96), the animal bones found in Umm Al Bighāl cave tombs indicated not only that feasting was

probably part of the local population funerary customs, but also that dairy products, and probably meat, were part of their diet. The archaeological evidence showed similarities in tomb architecture and offerings (Helms and McCreery 1988), which might reflect the absence of socio-economic (class) differences between the buried. The presence of the huge number of coloured coral beads in different tombs, including males, provided an evidence of jewellery sophistication and a costly rarity. This might reflect relative prosperity of a local community that had the means for direct or indirect trade connection with communities along the Red Sea shores, as previously suggested for shells (cited cases in Philip 2008:209).

The available biological and archaeological evidence suggest that the examined human skeletal remains from Umm Al Bighāl cave tombs were probably of individuals from a small, interrelated, and agricultural community of the EBA-IV. The burials suggested the absence of socio-economic differences between the buried. The population was relatively prosperous and had a diverse diet and the means to purchase interesting jewellery and that feasting was part of its funerary rituals. These suggestions have to be considered with some reservations due to the available small sample size from this site.

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CHRISTIANITY IN PETRA DURING THE FOURTH TO THE SEVENTH CENTURIES AD

Mohammad Najjar

Introduction

Petra was one of the most important urban centers in southern Jordan during the Roman and Byzantine periods. By the beginning of the early Islamic period, however, the city had largely lost its political and economic significance, and settlement gradually shifted eastward toward the area of modern Wādī Mūsā, where 'Ayn Mūsā is located. This paper examines the development of Christianity in Petra from the fourth to the seventh centuries AD, placing it within its broader political, historical, and religious contexts, and tracing the interaction between pagan traditions, imperial policy, and ecclesiastical developments.

Petra in the Roman and Byzantine Administrative Context

During the second and third centuries AD, three Arab client kingdoms dominated the Levant: the Nabataean Kingdom, the Kingdom of Edessa, and the Kingdom of Palmyra. Prior to their annexation by Rome, these kingdoms used Aramaic as both language and script. Following their annexation in AD106, 248 and 273 respectively, they ceased to exist as independent political entities and were integrated into the Roman imperial system.

Their populations became Roman provincials within the *Imperium Romanum*. The annexation of vast and highly significant units from the Arab political structures in the Levant during the second and third centuries was one of the most serious political shifts in the empire. It was during this period that the *Constitutio Antoniniana* of AD212 was passed, granting

citizenship to all free inhabitants of the empire and abolishing discrimination between Romans and the inhabitants of territories under Roman rule.

The new citizens (*cives*) were citizens of Rome and later to Byzantium, and their history thus became part of Roman and Byzantine provincial history. These were the Arabs of such client-states as Petra and Palmyra, who continued to live within the limes after the annexation of the first by Trajan and the second by Aurelian and who lived mainly in the eastern provinces of the Diocese of the Orient.

Prior to the annexation, the region had been exposed to Hellenistic cultural influence long before Roman rule through contacts with the Seleucid and Ptolemaic kingdoms. Built around the time of the Hellenistic and Roman Empires by the Nabatean Arabs, the architecture of Petra as well as other cities in the region often reflected the work of Greek architects (Fig. 1). In fact, the name of the ancient city itself is the word for "stone" in Greek. The most recognizable structure in the ancient city of Petra, the tomb called the "KHaznah" in Arabic, or "Treasury" in English, shows the indelible influence of classic Greek architecture, art and religion. Its stunning Corinthian-styled columns create a dramatic entrance to the tombs.

As a result, Greek culture (Fig. 2), and language were widely adopted, and many Arabs assumed Hellenized or Greek names that masked their Arab origins. Although Greek became dominant in inscriptions, native languages continued to be used. Nabataean remained in use into the fourth century.

The earliest dated Arabic inscription is that of Namara (AD328), written in Nabataean script derived from Aramaic, while the earliest example of the fully developed Arabic script dates to approximately AD512 at Zabad.

Petra belonged to the Roman province of Arabia until AD295–297. Under Emperor Diocletian's administrative reforms, Petra later became the capital of the newly established province of Palestina Tertia, which included territories south of Arnon on both sides of Wādī 'Arabah besides Sinai. Its significance has risen up because of the main trade route had been shifted to west Arabia as a result of the Persian Wars of the fourth and the sixth centuries, when presumably the Mesopotamian route became dangerous (Shahid 1984: 16).

The Emergence and Spread of Christianity in the Roman East

Christianity emerged in Judaea during the reign of the Herodians in the first century and spread rapidly throughout the eastern Mediterranean. Christianity was initially regarded by Roman officials as a local movement or a Jewish sect rather than a political threat. Roman religious policy generally tolerated diverse cults as long as they did not conflict with the Imperial Cult, whose primary concern was civic order and state stability. While persecution of Christians was not systematic, notable episodes occurred, including Nero's persecution following the Great Fire of Rome (AD64), and the empire-wide policy under Emperor Decius (AD249–251), which required citizens to perform sacrifices to demonstrate loyalty. Christian refusal to comply led to persecution and martyrdom.



1. Isis-Venus-Al 'Uzzā.

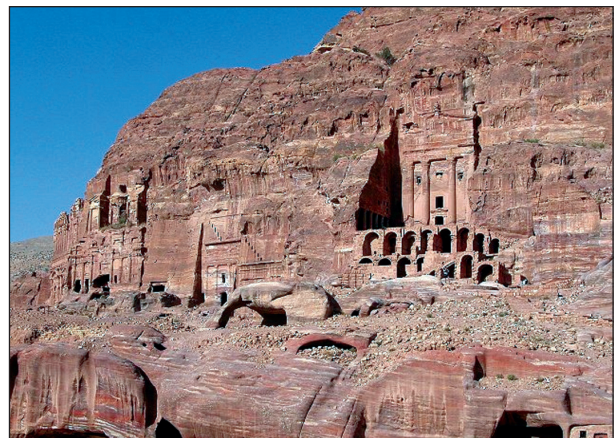
Diocletian Persecution and Petra as a Place of Exile

The most severe persecution occurred during the reign of Diocletian (AD284–305), who strongly promoted the Imperial Cult. Persecutions were carried out by the prefect Maximus who was later sent to 'Ammān to oppress more Christians. Christianity was viewed as antisocial and atheistic, as it rejected the existence of Roman deities altogether. Despite the Nabataean tradition of religious syncretism, Christians in Petra resisted Diocletian's edicts.

Prefect Maximus, later governor of Arabia, actively prosecuted Christians in Petra and 'Ammān. Petra –particularly the copper mines of Phaeno (Faynan)– became a place of exile and forced labor for Christians from Petra and the wider region including Palestine, Egypt, Central Anatolia (Eusebius 1861: 39). In AD303, the so-called Great Persecution began, involving the destruction of churches, confiscation of scriptures, and execution or condemnation of those who refused to honor the Imperial Cult.

From Toleration to Triumph: Christianity in the Fourth Century

The persecution ended with the accession of Constantine (AD306–337), who issued an Edict of Toleration restoring the legal status of Christianity. By the end of the fourth century, Christianity had become the official religion of the Roman Empire. Missionary figures played a crucial role in the Christianization of the region. Saint Hilarion (AD291–371), renowned for his ascetic life and miraculous powers, was instrumental in converting the inhabitants of



2. The Royal tombs.

Elusa (Arabic KHalasah), a major Nabataean city in southern Palestine. Elusa had previously been a center of pagan worship devoted to Venus (Al 'Uzzā), whose cult was shared by both settled Arabs and nomadic Saracens. According to Jerome, Hilarion's activities led to mass conversion and the establishment of the first church in the city (Shahid 1984: 299). The conversion of the Saracens in and around Elusa reflects a phenomenon that has been noticed elsewhere in the process of Christianization among the Arabs, namely, that it was carried through by the anchorites and the eremites, the holy men of this early Christian period. Petra was the seat of a bishop since AD343. Bishops Arius and Asterius attended the Council of Sardica and shifted to the anti-Arian positions. For this reason, Asterius was sent into exile by the Arian Emperor Constantius. Petra was the seat of a bishop within the patriarchate of Antioch until AD451, after which it was transferred to the patriarchate of Jerusalem.

Persistence of Paganism and Monastic Activity

Despite official Christianization, pagan practices persisted in Petra well into the late fourth century. Bishop Epiphanius (Epiphanius, quoted by Shahid 1985: 552) describes an annual ritual celebrated on the night of January 5–6 in honor of a virgin goddess associated with the sun, a practice closely resembling Christian nativity symbolism. Similar celebrations were observed in Elusa and Alexandria. Obviously, the people of Petra continued to celebrate the feast of Venus until late in the fourth century. The Arabs of Petra, till late in the fourth century, celebrated their pagan liturgy, centering round the worship of Aphrodite/Venus–Al 'Uzzā; they chant “the praises of the virgin in the Arabic dialect or language (Epiphanius, quoted by Shahid 1985: 552), calling her 'Kore' (Fig. 3). Petra continued to do so at least until the end of the fourth century when Epiphanius recorded these celebrations of Aphrodite/Venus/Al 'Uzzā few years after the death of Hilarion in AD371. And maybe even later (Bani al-Harith bin Yasker of Azd tribe) had an idol which was called Dushara in the 7th century (Ibn al-Kalbi 1995: 37).

Efforts to suppress paganism included the

destruction of the pagan temples by traveling groups of monks. Around AD423, Bar Sauma, (famous for never sitting or lying down) with his companions (40 monks) reached Petra during the night. The inhabitants refused to open the doors for them. Bar Sauma threatened to attack the town and burn it down. That night, and after four years of continuous drought, it started to rain so heavily that the city walls were washed away by the flood. Following this event, not only the inhabitants of the town, but also the priests of Al 'Uzzā and Dushara converted to Christianity. The next mention of Christianity in the 5th century was the inscription in the Urn Tomb referring to the conversion of part of it into a church in the time of bishop Jason and his deacon Julian (AD446). Nevertheless, traditional social practices, such as slavery, continued, and tensions between pagans and monks occasionally erupted into violence, as in the massacre at Rhaithu (Ammianus, quoted by Shahid 1984: 297).

Ecclesiastical Structures and Christological Controversies

Petra has only four churches. As rightly stated by Robert Schick the small number of churches in Petra is very shocking (Schick 1991: 583).

By the fifth century, churches had been constructed throughout Petra. The Ridge Church (Fig. 4) likely dates to the late fourth



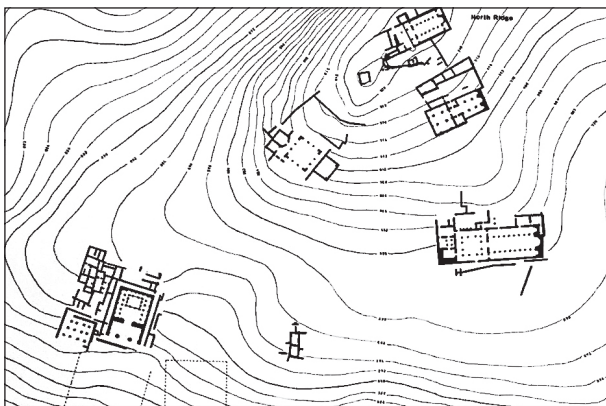
3. Kore, the virgin daughter of Zeus.

century, while a major monastic complex (Fig. 5) was established at Jabal Hārūn (Mount Aaron). In AD446, the Urn Tomb (Fig. 6) was converted into a church dedicated to Christ the Savior (Sartre 1993: 82) during the episcopate of Bishop Jason (Fig. 7). Petra became entangled in major Christological controversies. Following the Council of Ephesus (AD431), Archbishop Nestorius was exiled to Petra, most probably to Faynān, which fell within the diocese of Petra. Later theological disputes, including Monophysitism, continued to affect the region, as rival emperors supported opposing doctrines and exiled dissenting bishops to Petra and its hinterland.

Churches, Papyri and Urban Life in Sixth-Century Petra

A large basilica with a baptistery was constructed north of the colonnaded street in the late fifth century (Fig. 8). Its mosaic pavements depict human, animal, and bird figures framed within vine-bordered roundels (Fig. 9). The church was destroyed by an earthquake in AD551, although occupation continued into the seventh century. The discovery of 140 Greek papyri in Petra's main church in 1993 provides invaluable insight into the city's administrative, economic, and religious life during the sixth century. These documents, dated between AD513 and 594, record donations, property transactions, and ecclesiastical offices. One of them mentions Obodianos, a Nabataean landowner bequeathed all his belongings to be divided equally between the "Holy House (Monastery) of our Lord the Saint High Priest Aaron" and the "most Holy Hospital of the Saint and Gloriously Triumphant Martyr

Kyrikos" in Zadakatha (today's Sadaqah/Petra). Since one of the executors of this will was the archdeacon of "the Church of our blessed and All-Holy Lady, the Glorious God-bearing and ever-Virgin Mary, associated with episcopal churches and the the papyri were found in a room annexed to Petra church, it is reasonable to assume that Petra church was the metropolitan seat of Palestina Tertia (Piccirillo 1992: 334), the Cathedral which was dedicated the Virgin. The dedication of the main church



4. Ridge churches.



5. Aaron tomb.



7. The Urn tomb.



7. The Urn tomb.

to the Virgin Mary (Theotokos) reflects Petra's affiliation to Orthodoxy.

Decline and Transformation in the Seventh Century

The last bishop of Petra was Athenogenes. By the early seventh century, Petra had ceased to function as a metropolitan ecclesiastical center, with authority transferred to Rabbath Moab (modern Ar Rabbah). After severe fire damage, the city's great church fell into disuse. Petra is notably absent from the peace treaty concluded with the Prophet Muhammad in AD630, indicating its diminished political and religious role by that time.

Conclusion

The history of Christianity in Petra from the fourth to the seventh centuries AD reflects broader transformations in the Roman and Byzantine Near East. Petra served not only as a regional administrative and ecclesiastical center but also as a place of exile, theological

conflict, and cultural interaction. Archaeological evidence, inscriptions, and papyri collectively demonstrate the city's complex religious landscape and its gradual decline on the eve of the Islamic period.

The Christianization of Petra was a gradual process between the fourth and the sixth centuries AD, evidenced by churches, inscriptions, and episcopal activity. Claims that Petra converted suddenly due to actions of a single ascetic figure such as Barsauma, belong to later Hagiographical traditions rather than historical or archaeological evidence. The conversion of Christians communities in the Levant after the early Islamic conquest is a gradual and complex process, involving demographic shifts, changing political control, and continuous use or abandonment of church sites over several generations- not a singular dramatic change.

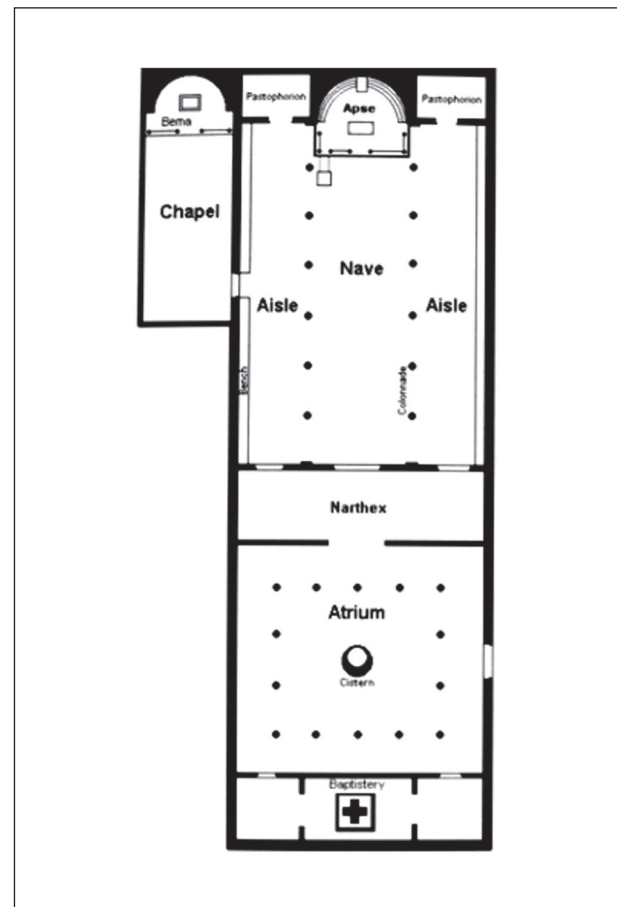
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8. The Basilica (Petra church).



9. Petra church.



10. Petra church.

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RENOVATION OF AL KARAK ARCHAEOLOGICAL MUSEUM AS CORE OF HERITAGE TOURISM AND AWARENESS WITH TRIAL INTRODUCTION OF MULTILINGUAL INTERPRETATION BY TWO-DIMENSIONAL CODE “QR CODE” IN EXHIBITION

Koji Oyama, Sate Massadeh and Shatha Mubaideen

Introduction

On 23rd of March 2019, newly renovated Al Karak Archaeological Museum (KAM) was opened¹. The renovation and relocation of KAM has been implemented by the Department of Antiquities (DoA) and Japan International Cooperation Agency (JICA) with the cooperation of the Ministry of Tourism and Antiquities (MOTA)².

1. The opening (re-opening) ceremony of KAM was held in the presence of the H.E. Mr. Yazid OlAyan (Acting Director General of DoA) on behalf of H.E. Ms. Majd Shweikeh (Minister of Tourism and Antiquities), H.E. Mr. Hidenao Yanagi (Ambassador of Japan to Jordan), Mr. Mahmoud Soub (Director of MOTA Al Karak Directorate) and Mr. Tsutomu Kobayashi (Chief Representative of JICA Jordan Office). Title of each attendee mentioned here is his or her title at the ceremony.

2. Renovation work of the museum building was implemented by supervision of Eng. Asma Shahaltog (DoA). Renovation work of exhibition was implemented by the preparation team led by the authors with help and project coordination by Ms. Mais Ghawi (Program coordinator of JICA heritage tourism project in MOTA). The work was cooperated by Mr. Khaled Tarawneh (Director of DoA Al Karak) and Mr. Hamza Jarajrah. Exhibition contents, in particular graphic panels, were reviewed/edited by the DoA HQ team led by Ms. Samia Khouri (DoA Museum and Awareness Directorate), Ms. Hanadi al Taher (DoA Research and Publication Directorate) and cooperated by Ms. Fadia al-Adwan. Production work of Al Karak tourism map was implemented by the authors (Oyama and Massadeh) and Mr. Mahmoud Soub (Director of MOTA Al Karak Directorate) with help by Ms. Huda Abu Nowwar (Program coordinator of JICA heritage tourism project in MOTA). Title of each person mentioned above is his or her title during the preparation stage of the museum until 2019. Currently in 2023 Mr. Hamza Jarajrah (Curator of KAM) is in charge of operation and activity of the museum with cooperation of DoA Museum Directorate headed by Mr. Basem Mahameed.

New location of renovated KAM is the part of the historic Ottoman building complex (*Saray*) facing to the north fosse of Al Karak Castle (**Fig. 1**)³. Before the renovation, KAM was located in the vaulted gallery in the Middle Islamic lower bailey of Al Karak Castle⁴. The former KAM was the work renovated under the Tourism Sector Development Project (TSDP) which had been implemented by MOTA and JICA (JICA 2000; Oyama 2016)⁵. Since 1999, through several projects, such as TSDP and “Technical Cooperation Project for Tourism Development through Museum Activities”, as well as dispatching experts and volunteers, JICA has cooperated construction, exhibition planning, education and museum management of several museums in addition to KAM, *i.e.* the Jordan Museum in ‘Ammān, Historic Old Salt Museum and Salt Ecomuseum in Old historic city of As Salt, the Dead Sea Museum near Hammamāt Mā‘īn and the Petra Museum. The former KAM was opened in 2004 and had been operated by DoA. Due to the detection of cracks in the lower bailey of the Al Karak Castle, where KAM was located, the decision was made to temporarily close and relocate KAM for safety reasons.

3. Outline of newly renovated KAM were reported so far also by the curator of KAM (Al-Jarajrah 2023) and author (Mubaideen 2018).

4. Authors (Massadeh and Oyama) have worked also for preparation and operation management of former KAM.

5. Opinions, comments and viewpoint mentioned in this paper is based on author’s point of view, not official statement by JICA.



1. Newly renovated Al Karak Archaeological Museum. (Photo by the author "Oyama").

Al Karak Archaeological Museum as Core of Heritage Tourism in Al Karak

The area covered by the exhibition of KAM is the archaeology and history of the Al Karak region (area of Al Karak Governorate), especially focusing on Al Karak plateau and the archaeological sites along the King's Highway, as well as the archaeology and history of Al Karak castle and fortified town of Al Karak, especially focusing on Medieval Al Karak castle and town. KAM play a role as regional museum of Al Karak region as well as museum of Al Karak town and site museum of Al Karak castle. Before KAM had first renovated by JICA project and opened in 2004, KAM existed

in the same vaulted room inside the castle⁶ but the exhibition consisted of merely display of archaeological artifacts from the area around Al Karak including Tafileh. The presentation of history of Al Karak town and Al Karak castle was not included in the old KAM before the renovation project by JICA since 2000 (Oyama 2016:252-254).

In the context of heritage tourism in Al Karak region, KAM is expected to be core of network connecting cultural heritage of three areas; 1) Al Karak Castle 2) Historical Al Karak town 3) Al Karak region, in particular sites along the King's Highway on Al Karak Plateau. This role of KAM as core of heritage tourism is similar concept as core of ecomuseum (Oyama 2019a: 427). Raising awareness by local Al Karak community toward their own cultural heritage

is important mission of KAM as well. KAM as core of regional heritage can play such social role through exhibition and education activities. It should be noted that folklore, living heritage and modern history of Al Karak area is not covered by the exhibition of KAM considering the plan of new folklore museum in Al Karak.

The King's Highway and Al Karak Archaeological Museum

The King's Highway passing through the town of Al Karak and the Al Karak region is one of major themes addressed by KAM. The King's Highway in Al Karak region was part of *Via Nova Traiana* in Roman period and part of the pilgrimage route to Mecca (*Darb Al Hajj*) in the Islamic periods. The role of the King's Highway played for the geopolitics of Al Karak region has been significant. With archaeological sites along this route, as well as continuous use of the route in history, the King's Highway itself is an important "historical route as cultural heritage", as proposed by UNESCO (UNESCO 1994). One of the missions for KAM is to promote awareness toward the King's Highway as cultural heritage.

The plan of "King's Highway Heritage Route" connecting main heritage sites and museums from 'Ammān (Jordan Museum) to Al 'Aqabah along the King's Highway, starting from the Jordan Museum, has been proposed by the author (Oyama) and MOTA (Oyama 2019a). In this plan, local museums along the

6. Plan of establishment of KAM dates back to the 1960's (Ajaj 2009:44-45).

King's Highway⁷ are expected to be the core of heritage tourism as well as promotion of local community awareness in each region. Through the introduction of the King's Highway and main archaeological sites along this historical route in Al Karak plateau by exhibition, KAM is expected to be one of core museums along the King's Highway Heritage Route.

Each of the exhibition section of KAM deals with “the Kings Highway” in different period of local history as follows;

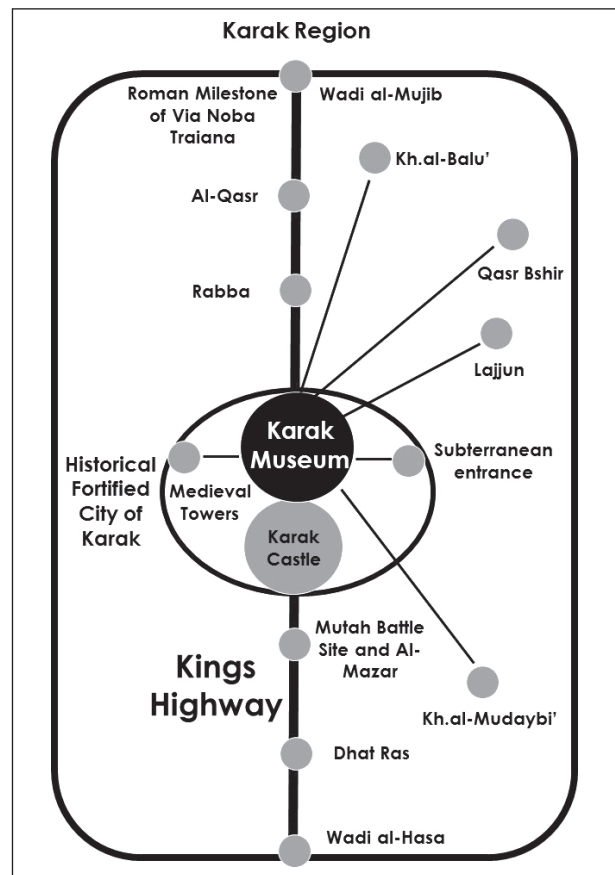
- 1) Introduction: Outline of the King's Highway.
- 2) Iron Age Moab exhibition: the King's Highway with relation to the Moabite Kingdom.
- 3) Roman Exhibition: *Via Nova Traiana* along the King's Highway.
- 4) Medieval Al Karak exhibition: *Darb Al Hajj* through the King's Highway.

Scheme of this network among KAM as core and several heritage sites in Al Karak, in particular area along the King's highway, can be shown as **Fig. 2** (Oyama 2019a: 427).

New Building Facilities of Al Karak Archaeological Museum

Renovated KAM exhibition is located in the western building of the “*Saraya*” complex. This *Saraya* complex is the group of the stone-built Ottoman historical buildings, originally used for administration by the Ottoman, that had been renovated⁸ and utilized as tourism facilities before it was converted to the museum. Renovation work of the basic parts of the museum building facility, including walls and electricity, had been implemented by the Department of Antiquities since 2016. Exhibition work has been implemented under the cooperation of JICA.

The exhibition space of the former Al Karak Museum consisted of two rooms that were renovated from a long medieval vaulted room. The first room dealt with exhibition section of “Introduction” and “Local History of Al Karak Region”, and the second with that of “Medieval History of Al Karak Castle and



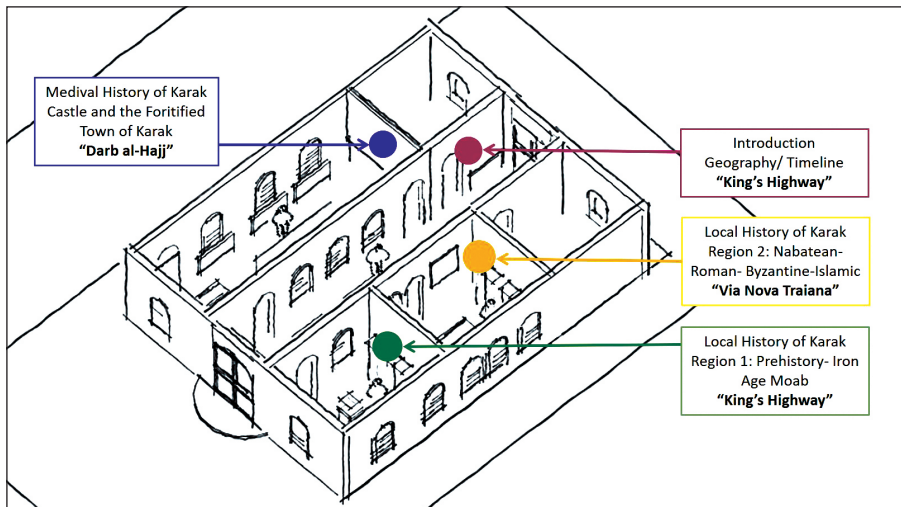
2. Schematic plan of Al Karak Archaeological Museum and local heritage network (Oyama 2019).

the City of Al Karak” and “Bab Adh DHira’ Tomb Exhibition” (Oyama 2016: 253-254). The exhibition space in the new KAM, which was renovated from historical Ottoman building (*Saraya*), consists of the central hall area with the entrance and exit, two rooms in the right wing, and one room in the left wing, for a total of four rooms (**Fig. 3**). Each room is smaller than the exhibition rooms in the former KAM. Therefore, the contents of the exhibition were reconfigured, taking into consideration the reduced area of the exhibition space and the layout of the new exhibition rooms. The showcases of the former KAM were fixed in the exhibition room and were difficult to relocate, so the showcases were re-produced again. Graphic panels were also re-planned, edited, and newly produced based on the contents of the former KAM⁹. AV monitor screen

7. Mādabā Regional Museum (under planning), Al Karak Archaeological Museum, At Tafilah Museum (under planning), Petra Museum and Al ‘Aqabah Museum.

8. Renovation of historical building complex of Ottoman *Saraya* in Al Karak was implemented by the World Bank project.

9. Text used in graphic panels of former KAM were based on original text written by Dr. Zeidan Kafafi, Dr. Fawzi Zayadine and Dr. Ghazi Bisheh, The text used for the graphic panels of renovated KAM were also partially based on the original texts written by them.



3. Overview drawing of Al Karak Archaeological Museum exhibition rooms. (Drawing by the author (Mubaideen)).

were newly installed in the renovated KAM.

Accessibility Survey of New KAM Building Facilities

During the renovation stage of KAM building in 2016, a field survey of museum facilities from accessibility/barrier-free perspective was conducted by the team of JICA expert in the field of disability and accessibility specialists in Higher Council for Affairs of Persons with Disabilities (HCD)¹⁰. Accessibility in the museum for wheel-chair user were checked on site. Advice and recommendation for barrier-free based on the survey was given to KAM team by disability specialist team. It was considered and reflected in the renovation work of the museum facilities, such as accessible space size in exhibition floor and entrance in lavatory.

Exhibition of Renovated Al Karak Archaeological Museum

Renovated permanent exhibition consists of the following three sections (Fig. 4)

- 1) Introduction
- 2) Local History of Al Karak Region (two sub-parts included)
- 3) Medieval History of Al Karak Castle and the Fortified Town of Al Karak

The contents of each exhibition are as follows;

Karak Archaeological Museum Exhibition Zoning (with key theme of "historical route" in each zone)



4. Exhibition zoning of Al Karak Archaeological Museum with key theme of historical route in each zone.

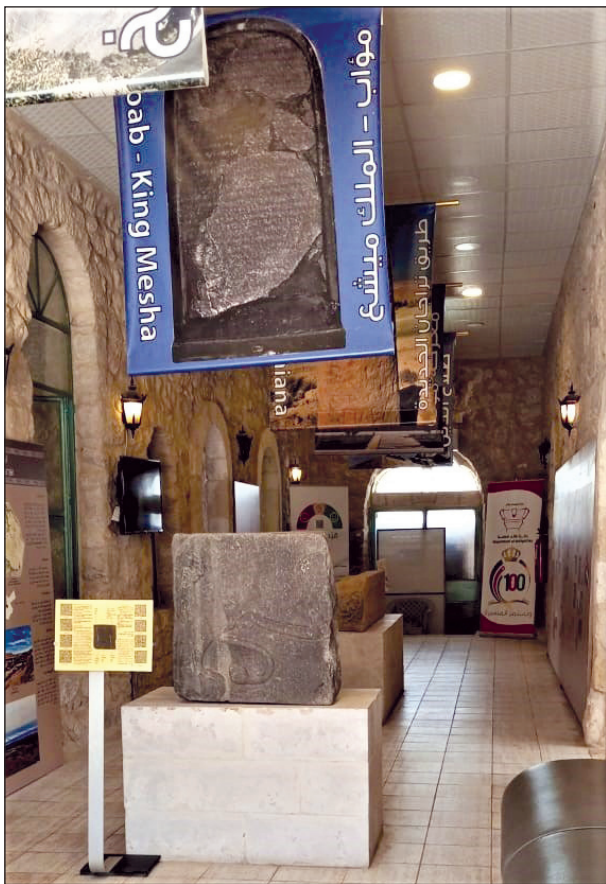
Introduction (Fig. 5)

Central space of the building is allocated to the exhibition room for the Introduction. Banners from the ceiling indicate the key words in the permanent exhibition of KAM dealing with local history of Al Karak, such as "Moab" "Via Nova Traiana" "Battle of Muthah" and "Salah al-Din". Two representative artifacts from Al Karak area are exhibited in the introduction hall. The first artifact is the basalt slab with part of lion relief from Iron age Moab, called "The Al Karak Lion" (Weber 2017:

87)¹¹. This basalt slab, which was reused as part of the wall in a heritage building near Al Karak castle, was originally part of the gateway of monumental architecture in the

10. Ms.Yahoko Asai, JICA Expert/Advisor for Disability Affairs, Eng.Rula Jaradat and Ms. Mayson Hamarshah, accessibility specialists in the Higher Council for Affairs of Persons with Disabilities (HCD).

11. "The Al Karak Lion" is one of two Iron age basalt slabs existing in Al Karak.



5. Exhibition of central hall (Photo by Hamza Jarajrah).

Moabite Kingdom in Al Karak area (Weber 2017). This artifact is displayed as one of the representative objects telling the importance of Al Karak in the Iron Age Moab. The second artifact is the limestone lintel with Mamluke inscription showing the title of “Al-Marik al-Mansur”¹², which was excavated in Al Karak castle. This artifact is displayed as one of the representative objects telling Medieval Al Karak castle and town. The following themes are presented in the introduction gallery.

Timeline

Historical time line focusing on the local history in the Al Karak region, from Paleolithic to modern era, is displayed as large panels in the corridor. It shows main historical events of Al Karak local history, photo of main archaeological sites and archaeological finds from Al Karak region in chronological order in the timeline.

12. In KAM it is thought to be possibly attributed to Mamluke Sultan Qalawun (reigned 1279-1290), however further study is required.

Land of Al Karak

Topographical and geographical feature of Al Karak region, in particular Al Karak plateau and several landscape of Al Karak region, including SHihān Mountain (Jabal SHihān), Wādī Al Mūjib as northern border of Al Karak governorate, Wādī Al Ḥasā as southern border of Al Karak governorate, and Wādī Al Karak going down to the south of the Dead Sea, are introduced in panel and slide show by AV screen.

Al Karak and the King’s Highway

General outline history of the King’s Highway shown above is introduced, with indicating main heritage sites, in addition to Al Karak Castle and town, along the King’s Highway such as Ar Rabbah, DHāt Rās *etc.*

Local History of Al Karak Region

Facing the east side of the central gallery hall are two small exhibition rooms. These two exhibition rooms deal with the local history of Al Karak region until the early Islamic period.

Local History of Al Karak Region: First Section

The first exhibition room, located in the southeast corner of the museum building, deals with the prehistory of the Al Karak region up to the Iron Age, with a focus on themes related to the Iron Age Moab, considering that Al Karak region is part of the area called Moab in history (Miller 1991: 1).

This room contains small exhibition of Al Karak prehistory before the Iron age, from palaeolithic to the Bronze age. Handax from Wādī ‘Assāl, Flint tools from Wādī Al Ḥasā, and the Early Bronze age pottery from Bāb Adh DHirā’ are on display. Several Neolithic and Bronze Age archaeological sites and monuments, including Adh DHirā’, Bāb Adh DHirā’, and the standing stone in Adir, are introduced in panel and slide show by AV screen.

Exhibition Relating with the Iron Age Moab and the King’s Highway (Fig. 6)

The important theme of the prehistory exhibition is the Iron Age Moab and the King’s Highway, considering that Al Karak region is historically part of the area of ‘Moab’ (Miller



6. Exhibition of “ Local History of Al Karak: I”: Iron Age Moabite (Photo by the Author (Oyama)).

1991:1; Routledge 2004:48). The following is the main contents of the exhibition relating with the Iron Age Moab.

Moabite Kingdom and the King’s Highway

The area of the Moabite Kingdom and other two kingdoms (the Ammonite Kingdom and the Edomite Kingdom) in the Iron age Jordan, with the sites of their capitals along the King’s Highway (‘Ammān, DHībān and Buṣayrah) are shown in the map in order to explain the geo-politics of the Moabite Kingdom. Several important Iron age sites of the Moabite in Al Karak region, such as Al Bālū’ and Khirbat Al Muḍaybi’, are introduced in the panel as well as slide show of the AV screen in the exhibition room. Wādī Al Mūjib and Wādī Al Ḥasā, which had geo-political importance for the Moabite, are also introduced in the map and slide show.

Al Bālū’ Stele, which was found in 1930’s at Al Bālū’ in Al Karak region and currently displayed in the Jordan Museum, and the SHīhān Stele, which was found in 1851 at Rujm Al ‘Abd near Jabal SHīhān area in Al Karak region and currently displayed in the Louvre Museum in Paris, are introduced as photos in the “Moabite Kingdom” panel. Artifacts on display in the exhibition of the Moabite Kingdom includes fragment of basalt statue, which was possibly by the hand of same Moabite workshop as SHīhān stele (Hunziker-Rodewald and Deutsch 2014: 62-63). It is displayed beside the photo of SHīhān Stele for comparison of similarity in artistic style.

Moabite Language

As one of unique local cultural factors of the Iron Age Moabite, the Moabite language is also highlighted in the exhibition. Alphabet of the Moabite script is introduced with comparison of the alphabets of modern Arabic and Latin scripts. Artifacts on display in this section includes “Al Karak Inscription”, which is the basalt fragment with Moabite royal inscription found in Al Karak and obtained by the Jordan Archaeological Museum in ‘Ammān in 1958 (Reed and Winnett 1963; Hunziker-Rodewald and Deutsch 2014: 63), as well as the fragment of circular-shaped basalt object with the Moabite script from 1986 excavation of Al Bālū’. These two artifacts with the Moabite script are displayed next to the replica of the Mesha Stele and an explanation panel of the Moabite language to compare the Moabite scripts.

King Mesha and the Victory of the Moabite

The replica of the Mesha Stele, which was found in 1868 and is on exhibition as the original in the Louvre Museum, is on display. Mesha Stele was found in DHībān, which is in Mādabā region and not in Al Karak region, however considering the importance of Mesha Stele as part of the history of the Iron Age Moabite as well as the Moabite language, it is included in the exhibition of KAM. Several lines of the text in Mesha stele written by the Moabite script are translated into English and Arabic and presented in the panel behind the Mesha stele replica, to narrate the story of the



7. Exhibition of “ Local History of Al Karak:2” (Photo by Hamza Jarajah).

Moabite King Mesha, who defeated the Israelite King Omri in 850 BC, as well as to introduce the Moabite script.

Foreign Relation of the Moabite

The relationship between the Moabite and the dynasties in the surrounding areas such as Egypt and Mesopotamia is discussed here, showing a map of the Moabite Kingdom and surrounding area. As for the relation between Moab and Egypt, the Egyptian campaigns by Tuthmosis III (*ca.* 1482-1450BC) and Ramesses II (*ca.* 1304-1237BC), which probably included the territory of the Moabite in Mādabā and Al Karak area, are explained. Exhibition also introduce one of the Egyptian Hieroglyphic toponyms list of the places conquered by Tuthmosis III (called “Palestinian List” or “Megiddo List”), located in the relief of Karnak Temple at Luxor, mentioning toponym of “*hurkur*” by Egyptian Hieroglyph which can be probably identified as Al Karak (Miller 1991:8)¹³ The relation between the Mesopotamian dynasties and the Moabite Kingdom is discussed in terms of Assyrian rule over the Moab as well as the rebellion of the Moabite, which was a part of allies of Yamani of Ashdod as mentioned in a prism inscription, that occurred during the reign of Sargon II (Salje 2009 :739).

Displayed artefacts in the Iron Age section include a terracotta model of a shrine, which has a relief of two dancing women, possibly

Astarte, holding a tambourine. Displayed artefacts also include pithos from Bālū‘ dating to the iron age and was added to the exhibition after the opening of KAM.

Local History of Al Karak Region: Second Section (Fig. 7)

The second exhibition room, located north of the first room, deal with the Hellenistic/ Nabataean to early Islamic periods. Main themes in this exhibition are as follows;

Nabataean in Al Karak

It includes a display of the Nabataean inscription excavated in DHāt Rās, and the introduction of Nabataean temples in Al Qasr and DHāt Rās, located along the King’s Highway and having potentiality for heritage tourism. The exhibition introduces also the Nabataean relief which was reused as a block of the wall in the northeast of the upper court of Al Karak castle, and indicate the presence of the Nabataean in Al Karak.

Via Nova Traiana/Al Karak in Roman Period

As King’s Highway is a major theme of KAM, the key theme of this exhibition room is *Via Nova Traiana*, constructed between 111 and 114 AD by Emperor Trajan from Bostra to Ayla (Al ‘Aqabah) and passed Al Karak region. Part of this Roman road ran along the King’s Highway (Borstad and Haroun 2010:486; Zayadine 2004:374) In Al Karak region, it ran

13. No.101 of the Palestine list (Meggido list), identification by Donald Redford (Miller 1991:8).



8. Exhibition of “Medieval History of Al Karak Castle and the fortified town of Al Karak” (Photo by the author (Mubaideen)).

almost along the King’s Highway from Wādī Al Mūjib in the north to Wādī Al Ḥasā in the south via Ar Rabbah (*Rabbathmoba/Areopolis*) and Al Karak town area. In the east of the *Via Nova Traiana* exists the line of the Roman fortress (*Limes Arabicus*), such as Al Lajjūn and Qaṣr Bashīr. The Roman milestone of the *Via Nova Traiana* in Wādī Al Mūjib with Latin inscription of the title of Emperor Trajan is introduced as well to promote awareness toward the *Via Nova Traiana* and the Milestones¹⁴.

Rabbathmoba/Areopolis

As one of main cities in Al Karak region, in addition to Al Karak town, in Roman and Byzantine Period (Miller 1991:12-13), Ar Rabbah archaeological site (*Rabbathmoba/Areopolis*) has importance for the local history of Al Karak region as well as potential for heritage tourism in Al Karak area and the King’s Highway. In order to raise awareness toward this important historical city, which is not well known comparing to Al Karak castle, rich urban monuments of *Rabbathmoba/Areopolis*, such as Roman temple in the Diocletianic period and the paved Colonnaded Street (Gysens 2002: 493-496) are introduced here in panels and slide show. Part of the Peutinger map from 3rd or 4th

century showing the city “*Rababatora*”, which might have been derived from “*Rabbathmoba*” (Miller 1991:12) is also introduced.

Artifacts excavated in Ar Rabbah are displayed in this section, including Roman large pottery sherd of pithos with bas relief of the two youth, possibly twin, wearing Phrygian cap, and Roman terracotta inkpot in the shape of the head of Apollo wearing the wreath of laurel telling urban lifestyle in Ar Rabbah. In addition, Roman bronze lamp from Al Karak, in the shape of a swan with twin boys, is also on display.

Al Karak in the Byzantine Period

This exhibition introduce Al Karak as Byzantine town depicted and partially preserved in the Mādabā Mosaic Map as a fortified city in Moab named (*Charachmoba* (Χαρα)χυώβα) (Mayer 1990: 120-121; Miller 1991:13), telling the fact that Al Karak was already fortified town before the invasion of the Franks. The Byzantine church in Ar Rabbah (*Rabbathmoba/Areopolis*) (Gysens 2002:495) is also introduced as well. Main displayed artifacts include a Byzantine lamp with three nozzles from Al Lajjūn, possibly indicating the image of the “Tree of Life”, and a Byzantine female figurine from an excavation of a Byzantine tomb in Muḥay.

14. Although this milestone in Wādī Al Mūjib is important heritage as part of *Via Nova Traiana*, it has not been well managed as heritage and not been well noticed by local people as well as tourists, and partially suffered damage, possibly by vandalism.

Battle at Mu'tah

This section introduces the Battle at *Mutah* in 629AD (Al-Hasso 2004:17-18), which was a significant historical event in the early Islamic period as well as the local history of Al Karak, and the historical site of this battle at Mu'tah, which is an archaeological site of the middle Islamic Mosque and one of the important historical monuments along the King's Highway in Al Karak. *Maqāmāt As Ṣahābah* in Al Mazār, commemorating martyrs in the battle, are introduced as a religious historical heritage in the south of Al Karak region along the King's Highway.

Medieval History of Al Karak Castle and the Fortified Town of Al Karak (Fig. 8)

The long room facing the west side of the central gallery hall is allocated for the exhibition of the medieval history of Al Karak Castle and the fortified town of Al Karak, focusing on Al Karak during the Ayyubid, Mamluke and Frankish (Crusader) period. This exhibit is very important from a tourism point of view, as its content is directly related to heritage tourism and the interpretation of Al Karak Castle and the historic fortified town of Al Karak. The main themes and components in this exhibition room are as follows;

The Fortified Town of Al Karak

This exhibition introduce the structure of the historical fortified town of Al Karak mainly from defense strategy perspective. Located on the top of a sheer hill surrounded by deep gorges, the town of Al Karak took an advantage of its "natural fortified" terrain. Al Karak Castle is located on a high place in the southern edge of the fortified town. The following defensive feature of fortified Al Karak town and Al Karak castle are introduced

- Walls of fortified Al Karak town: As shown in the historical map of Al Karak town in "Arabia Petraea" by Musil in 1907. Part of the wall still remains in the eastern part of Al Karak town.
- Subterranean tunnel entrance gate to Al Karak town (East and West), which were originally the only accessible gateway to enter Al Karak town (Mayer 1990:118)
- Towers: Seven towers along the wall of

fortified Al Karak town. The location and name of each towers are shown in the Al Karak town model mentioned below.

- Fosses (Ditches): North fosse, located in the northern face of Al Karak castle (southern edge of the fortified Al Karak town) , which separates the castle from the town; and South fosse, located in the southern part (water reservoir) of Al Karak castle, which separates the castle from the hill (Jabal Ath THallājah) facing the south edge of the castle.
- Glacis: located in the southeastern foot of the castle.

The Model of "Al Karak Castle and Fortified Town of Al Karak " (Fig. 9)

A 1:400 scale model of "fortified city of Al Karak and Al Karak Castle" had been produced and exhibited in the previous KAM to raise awareness toward the topographical features and main cultural heritage sites of the historically fortified Al Karak town and introduce the structure of the Al Karak castle and its defense system in relation to fortified Al Karak town. During the closure of KAM, the model was placed in a closed exhibition room, however, it was partially damaged by falling stones and broken glass from skylight. Therefore, after the relocation of the model, restoration work on the model was carried out. Damaged parts of the model were repaired with model putty and clay. Some damaged part of the road and buildings in the model were repainted, and damaged parts of the natural sand ground were repaired with color powder. After the repairment of the model, a new explanation sign showing the main heritage features of Al Karak Castle and town was produced and installed on the model. The name of the sites inside the Al Karak Castle follows the description mentioned in the archaeological research of Al Karak Castle (Brown 2013). Heritage relating with historic fortified town of Al Karak, *i.e.* two subterranean gate entrance (east and west), town wall, five towers along the fortification wall line (Adh DHāhir Baybars Tower (Semi-circular Tower), Al Birkah Tower (Salah Ad Dīn Tower), Al Madrasah Tower (or An Naṣārā Tower), Adh DHāhir Baybars Tower (in the northwestern corner of the town) and



9. Model of Al Karak Castle and Historic Fortified Town Compared with Early 20th Century Map of Al Karak Town by Musil (Photo by Hamza Jarajrah).

Al Tanashāt Towers)¹⁵ are shown in the models. Main historic Mosques and churches as well as historic buildings are shown in the model too. Two large water reservoir in the Al Karak town, shown on the map in *Arabia Petraea* by Musil, are also shown in the model. These two water reservoir do not exist today. The place location of the eastern water reservoir is used now as a bus terminal today and keep the name of the place as “*Al Birkah*” (“water reservoir” in Arabic).

Comparison of Historical Map in Early 20th Century and Satellite Image of Al Karak Town Today

The historical map of Al Karak town in the early 20th century, which was shown in “*Arabia Petraea*” by Alois Musil in 1907¹⁶ and clearly shows a wall of fortified Al Karak town, and a satellite image of modern Al Karak town in 2017, which remain the shape of the historical fortified town, are shown as panels next to the model of Al Karak castle and town to explain

15. The name of the tower is based on description by MOTA who installed signage in each towers. These name follows the local name of towers.

16. Map of Al Karak town shown as “fig. 9. El-Kerak, Situationsplan” (Musil 1907:47).

the topographical shape of historic fortified Al Karak town. This exhibition aim to raise awareness toward archaeological, historical and touristic importance of fortified Al Karak town, including Al Karak castle, by comparison of historical map, satellite image, topographic model and photographs of several sites in fortified Al Karak town.

Siege against Al Karak Castle and Fortified Town

Before the Ayyubid captured Al Karak castle from the Franks in 1188, the fortified town of Al Karak and the castle suffered from several sieges, by Nur ad-Din Zangi and by Salah ad-Din in 1170’s and 1180’s (Pringle 1993: 286-287, Brown 2013b:712-713). The siege warfare in Al Karak is explained in a panel near the model of Al Karak castle and town to explain the fortification system of Al Karak town and castle.

Hajj Route (Darb Al Hajj) and Geo-Political Strategic Importance of Al Karak.

In relation to the main theme of “the King’s Highway” in KAM, Mecca pilgrimage route(*Darb Al Hajj*) passing through Al Karak in the Medieval Islamic period (El-Majali

and Mas'ad 1987: 311-315) is introduced. An overview of the Frankish (the Crusader) invasion against Jordan (*Oultrejordain*) is discussed here too, since the strategic importance of Al Karak as crossing point of the pilgrimage and trade route connecting Syria, Egypt, and the Arabian Peninsula was one of the reasons for the Frankish invasion against Al Karak (Hillenbrand 1999:292).

Construction of Al Karak Castle

The history of Al Karak Castle is introduced here, including the construction of the fortress which begun in 1142 by the Pagan (Payen) the Butler of the Latin Kingdom (Mayer 1990:116; Milwright 2008:29; Brown 1989:287-290; Sinibaldi 2022:130), the history before the presence of the Franks, and the history after the capture of the castle by the Ayyubid and Mamluk dynasties. The part of the mosque wall with arrow slit, which is the part of early Islamic tower possibly during the Jarrahid interlude of 981-982 (Brown 2013a:313) is introduced with the Frankish chapel and middle Islamic Mosque in order to show historical diversity of Al Karak castle.

Salah ad-Din, Raynald of Chatillon and Battle of Hittin

As part of history relating with Al Karak castle and town, this section explain outline stories of Salah ad-Din, Raynald of Châtillon (ca. 1125-1187) who became the lord of *Oultrejordain* and obtained Al Karak castle, aggressive action of Raynald who attacked pilgrimage caravan, victory by Salah ad-Din in the battle of *Hittin* and execution of Raynald, and the capture of Al Karak castle by al-'Adil who was brother of Salah ad-Din (Brown 2013b:712-713; Milwright 2008:31-38).

The Importance of Al Karak for the Ayyubids

The topics introduced here includes Al Karak under the reign of al-Malik al-'Adil, al-Malik al-Muazzam Issa, and Imarat al-Al Karak under al-Malik an-Nasir Daud. Negotiation between the Ayyubids and the Franks during the 5th Crusader for exchange of several important cities except Al Karak and Ash SHawbak is also introduced to present the strategic importance of Al Karak and Ash SHawbak for the Ayyubids (Milwright 2008:38-39; Sinibaldi 2022:125).

Al Karak in the Mamluk Period

This section introduces the story of Sultan Zahir Baybars relating with Al Karak, as well as monuments in Al Karak town built by Baybars including Burj Baybars which hold relief of lion emblem of Sultan Zahir Baybars. Mamlakat Al Karak in Mamluk period is also introduced with focus on Sultan al-Nasir Mohammad (1285-1341) and Sultan al-Nasir Ahmad (1316-1344) who had strong ties with Al Karak (Drory 2005).

Royal Life at Palaces in Al Karak Castle

As showing luxury royal life at Al Karak castle in the middle Islamic period, this exhibition highlights several *Qā'ah* (reception hall) as follows, which possibly existed during the Ayyubia and Mamluk period (Brown 2013a);

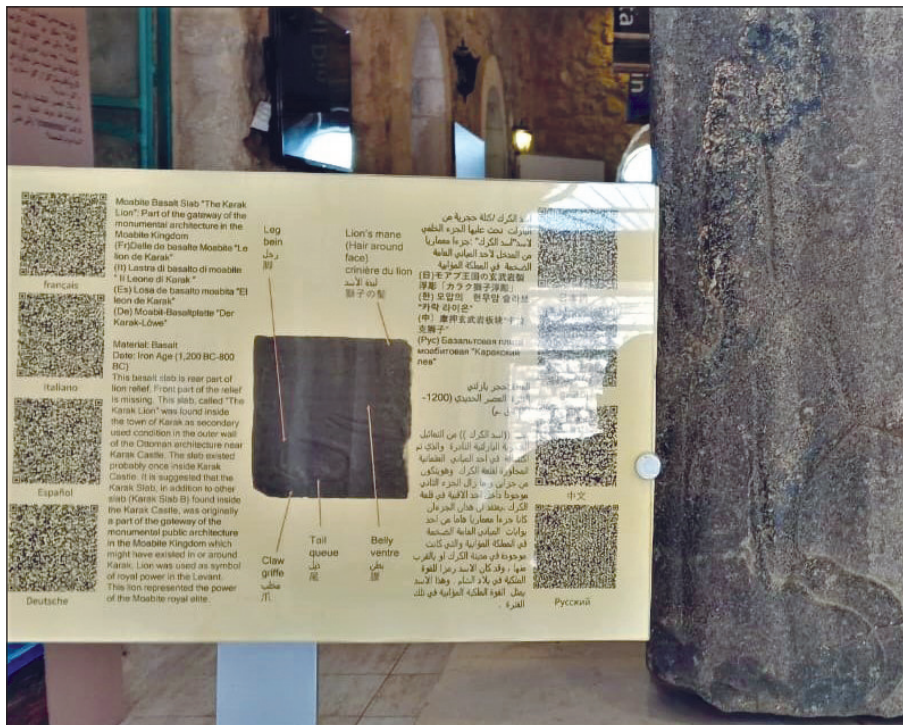
- Qā'at An Nuḥās (Hall of Copper) constructed by Mamluk Sultan an-Nasir Mohammad.
- Grand Qā'ah in the underground level of lower bailey.
- Grand Qā'ah in the Upper Castle (Probably Al Qā'ah An Nāṣiriyyah Hall) constructed by Ayyubid Amir an-Nasir Daud.
- Small Qā'ah in the Upper Castle

Qā'ah mentioned above other than Qā'at An Nuḥās are also shown in the model and the tourism map of Al Karak Castle to raise awareness toward the royal life in Al Karak castle in the middle Islamic period.

Imported glazed ware excavated from Al Karak castle, which was favored by Mamluk ruling class in Al Karak (Brown 1989:297-298) and possibly used for luxury dining in Al Karak castle, are displayed with explanation panel of *Qā'at* in the castle to show luxury royal castle life.

Furusiyyah and Al Karak

During the Mamluk period, Al Karak was considered as a place to learn horsemanship (*Furusiyyah*), and Mamluk Sultan in Cairo often sent his son to Al Karak to learn *Furusiyyah* (Drory 2005 :19). The importance of Al Karak as the place for *Furusiyyah* is introduced, with historical drawing of several actions practiced in *Furusiyyah*. The open terrace of lower bailey of Al Karak castle, which is suitable for military exercises (Brown 2013:309), is also introduced



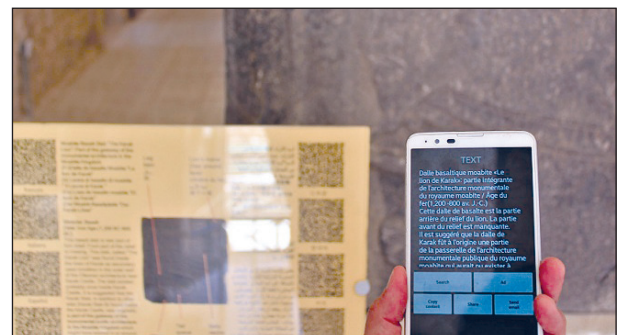
10. Multilingual Caption Label by Two-Dimensional Code ("QR code") (Photo by Hamza Jarajrah).

in relation to *Furusiyyah* in Al Karak. In addition, Medieval iron mail shirt, which was originally exhibited in 'Ammān Archaeological Museum as artifacts from Ayyubid-Mamluk period and moved later to former KAM, is on display with the model of catapult and mobile siege tower covered with skin used for medieval siege warfare.

Introduction of Multilingual Caption Label Using Two-Dimensional Code ("QR code")¹⁷ in the New KAM Exhibition

Considering the international visitors with various language background in Al Karak castle and museum, multilingual explanation using QR code was introduced as a trial on some of the museum labels for the main display objects (Oyama 2019b). In addition to typical bilingual explanation text of Arabic and English as printed text, QR codes converted from explanation text by eight language (French, German, Italian, Spanish, Russian, Japanese, Chinese and Korean) are shown on the large size (A3 size) museum label of important objects. As a total, one museum label can include 10 language explanation texts (Fig. 10). By using mobile application for reading (QR code) in smartphone

or tablet devices, visitors can read explanation text of selected language. Explanation texts of selected language will appear on the screen of visitor's smartphone or tablet (Fig. 11). Since the contents of this QR code is not the hyperlink to the website page or file of explanation text but the converted explanation text itself, it is not necessary to connect to the internet. Without internet connection, visitor can read the text by smart phone. Although this method has limit of text amount to be used, it can be applied to the explanation signage in archaeological sites or museums that have no wi-fi or any internet service for visitors. This multilingual explanation system by QR code is also proposed to be used for signage system in Al Karak castle which was proposed to MOTA.



11. Explanation Text of Displayed Artifacts by Selected Language Appeared in Mobile Phone of Visitor by Reading QR Code.

17. "QR Code", which is a kind of two-dimensional code, is the registered trademark of Denso Wave Incorporated which invented this type of code.

Tour Route inside Al Karak Castle and Al Karak Town Starting from KAM as a Core

In order to make KAM as core of heritage tourism in Al Karak castle, it is preferable to unify design concept of presentation, such as signage, inside Al Karak Castle, with the design of KAM exhibition. Frame design of signage board inside Al Karak Castle were planned based on the same type of design concept of KAM graphic panels, to enhance connection between KAM as core and other heritage sites. A map of the walking tour map at Al Karak castle and town, showing KAM as core/starting points of the tour route, were also produced and distributed at the museum. One side of the map is Al Karak castle map showing main spots inside the castle, same spots as that shown in the model in KAM, and tour route starting from KAM. The other side is historical Al Karak town map showing main heritage spots in the historical fortified town of Al Karak, same spots as that shown in the model at KAM, and tour route starting from KAM. This map was also made following same design concept as KAM exhibition, in order to enhance KAM as core and heritage sites.

Concluding Remarks

Al Karak Archaeological Museum is expected to be a core of heritage tourism network including Al Karak Castle, the historic fortified town of Al Karak, the King's Highway as historical heritage route and other significant archaeological sites in Al Karak region, in particular along the King's Highway. Al Karak Castle attracts a lot of tourists: in 2019, it had 48,938 visitors, and it increased to 146,714 visitors in the year 2022¹⁸. Most of tourists, however, visit solely Al Karak castle. It is expected for KAM to introduce rich cultural heritage of Al Karak in addition to Al Karak castle to tourists, especially cultural heritage in historic fortified town of Al Karak that can bring benefit of tourism to local community of Al Karak if tourist spend more time by walking around the historic town.

Recently Al Karak Municipality has also been working on the rehabilitation of another historic building of Ottoman Saraya complex near KAM to adaptively reuse it as a museum

for Folklore/Living Heritage which will protect living heritage and tradition of Al Karak local community and present it to the tourists. By establishing network and collaboration between KAM and new Folklore museum, it will enrich tourism experience and community awareness toward heritage in Al Karak including Al Karak Castle and historic Al Karak town. Subsequently potentials of developing the concept of networking KAM as core and heritages in Al Karak, similar as ecomuseum, are obtainable, whereas the local community and tourist can aware rich cultural heritage in Al Karak with cultural and historical story. It will develop also awareness by the community-based organizations in Al Karak toward the characteristics and uniqueness of the region.

To fulfil this goal, education and community awareness activities is also essential for KAM. Activities relating with "International Museum Day" proposed by ICOM, which is currently popular in Jordanian museum field, was initiated by former KAM in 2005 with cooperation of JICA technical cooperation project for museum, and several education activities with local schools at Al Karak as well as community involvement programs were implemented by authors (Massadeh and Oyama) including hands on activities (Tarawneh and Massadeh 2007; Oyama 2007a,2007b). After the opening of renovated KAM in 2019, SNS (Facebook) page of KAM was also opened, to raise awareness to KAM, Al Karak castle and heritages in Al Karak to local community and tourists. Recently KAM often receive visit by local school classes in Al Karak. Based on the experience by former KAM, regular education and community awareness activities needs to be implemented to develop KAM as core of heritage awareness in Al Karak local community.

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18. Visitor data based on Ministry of Tourism and Antiquities.

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GHAWR AṢ ṢĀFĪ EXCAVATIONS 2017 – 2018

Konstantinos D. Politis and Alexandra Ariotti

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 20th 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 20th century adobe-built wall had therefore used the 15th 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 15th 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.

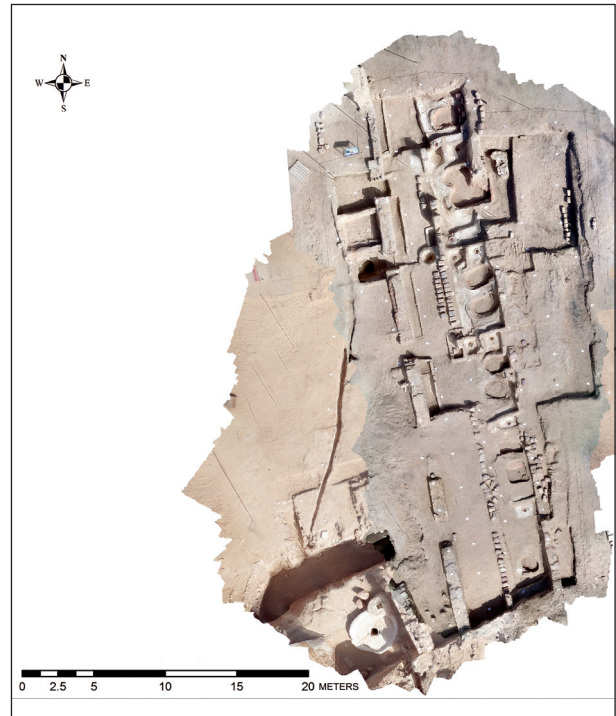
New information site signs were made by a local iron monger and pathways were extended by continuing the previous practice of using wooden pallets embedded in the sandy surface of the site. (Fig. 4)

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 Sāfī (ancient *Zoara* or *Zughar*) was known to be a producer of top-quality indigo. With deeper digging, 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 1st century BC. to 6th 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 1st 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 (1st century BC. to 1st 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 1st 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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A BYZANTINE INSCRIPTION FROM THE AREA G ECCLESIASTICAL COMPLEX OF ABILA, AT QUWAYLIBAH, JORDAN

Robert W. Smith, Adam C. Chambers, Kevin W. Larsen and Josiah D. Peeler

The Abila Expedition¹ excavating at Quwaylibah, Jordan during the summer of 2023 partially exposed a well-preserved mosaic pavement in the Area G Ecclesiastical Complex (Fig. 1). A portion of that tessellated floor preserves a Greek inscription that is of potential significance in reconstructing the history of Abila and adds to the corpus of Byzantine clerical names and inscriptions found in the region of *Palaestina-Secunda*. This report introduces the complex and focuses upon the inscription and its possible significance. It leaves discussion of the mosaic pavement's design and motifs to a later report that will come after the floor is fully exposed.

The Historical Context of the Area G Ecclesiastical Complex

The Area G Ecclesiastical Complex is a series of connected structures built by Byzantine-era residents of Abila to serve the perceived needs of the Christian community in the period of urban revival following terrible, early-sixth-century calamities that afflicted *Palaestina-Secunda*. Subsequently, following the Islamic forces' victory at the nearby Battle of

the Yarmuk in 635 AD, Abila was incorporated into *Jund Al Urdunn*. A significant Christian community with many actively used ecclesiastical structures persisted, and a variety of pilgrims still came to Abila during the rule of the Umayyad caliphs. The Area G Complex remained in ecclesiastical use through the time of the regionally devastating mid-eighth-century earthquakes. As Abila residents struggled to survive, they had no Byzantine imperial assistance to restore the broken bridges and tunnels of the Central Decapolis Water System. At the same time, political power and economic resources shifted away from the nearby Umayyad capital at Damascus with the ascendance of the Abbasid Caliphate at Baghdad in 750 AD. The impoverished population of Abila declined, and the damaged ecclesiastical complexes in the community became stock piles of architectural materials for reuse. The populace burned marble revetments from church buildings to make quicklime (CaO) for plastering cracked cisterns, and they employed fallen ashlar to erect walls of new residences sometimes within the ruins of the churches. The atrium and diaconicon of the Area G Complex were reconfigured into smaller domestic spaces occupied during the Abbasid period. The declining community eventually abandoned the Area G Ecclesiastical Complex after clay-rich soil slumped down the steep eastern slope of KHirbat Umm Al 'Amad, following a dramatic rain event during the Mamluk period (Lucke and Schmidt 2016). The atrium and subsidiary rooms on the south and the west sides of the abandoned complex were

1. Dr. W. Harold Mare of Covenant Seminary, St. Louis, MO, initiated the Abila Archaeological Expedition in 1980. Currently Dr. David Vila of John Brown University is the director of excavation. The summer 2023 archaeological season at Quwaylibah, Jordan was licensed by the Department of Antiquities of the Hashemite Kingdom of Jordan. The Expedition is particularly beholden to His Excellency, Dr. Fadi Bala'awi, Director-General, Zaid Gneimat of the Irbid District, Musa al-Malkawi Director of the local Bene Kenana District, and DoA Representatives: Saher Tuwaiq, Bashar al-Malkawi, Moyad Djerwan, and Areen Anakreh.



1. View of the Area G Ecclesiastical Complex from the west. Photo by Abo Yossef.

deeply buried preserving the architectural remains that had not been repurposed elsewhere.

The Physical Context

The Area G Ecclesiastical Complex (**Fig. 2**) is located above the urban center of Abila on the western side of the Wādī Quwaylibah at a highly visible, central location (UTM coordinates 32.680482° N and 35.869862° E) at an elevation of 436.05m. It was built over aqueducts that conveyed water north from ‘Ayn Quwaylibah and the Northern Decapolis Water System into the heart of the polis. The reservoir beneath

the Area G Complex, supplied by the Upper Aqueduct, distributed its waters to water features, baths in Area C, and the Area E Pilgrimage Complex. The water there helped generate a pilgrim-attracting sense of hierotopy (Smith 2020: 521-532). The Area G Complex, overlooking the central basalt road that conveyed people and produce E-W through Abila, was a spiritual asset that served both pilgrims and the local community. Located at mid-slope on a terrace cut into the side of Wādī Quwaylibah it avoided the stifling summer heat of the Area E Pilgrimage Complex near the bottom of the



2. Aerial view showing the urban context of the Area G Ecclesiastical Complex in conjunction with other excavated areas as seen from the East in 2022 (Photoby Firas Bq'ain. Image APAAME_20221106-FB-0597).

valley, in the wind shadow of the northern Tall Abīl, and the persistent winds that blew through the basilica located at Area A on the summit of Tall Abīl to the north and the basilicas on the height of KHirbat Umm Al ‘Amad to the west in Area D. The Area G Ecclesiastical complex alongside the monumental structures in Area B were likely the preferred venue for the regular activities of Abila’s ecclesiastical administrators.

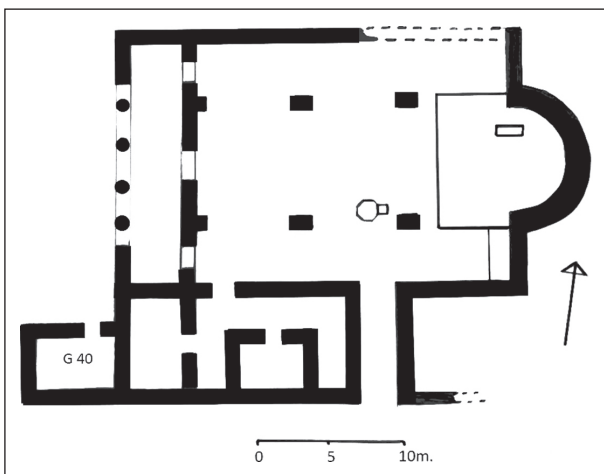
The Structural Context

The central component of the Area G Complex is a three-aisled basilica with a salient central apse (**Fig. 3**). The interior of the basilica measures *ca.* 17.5m. N-S and 23m. E-W and has an interior area of *ca.* 412m² including the apse. Its ashlar walls are made of locally quarried limestone, and its three western doorways were supported on basalt thresholds and spanned by monolithic basalt lintels quarried at nearby KHarjā. The interior walls were finished with imported Proconnessian marble revetment made from slices of columns of earlier Roman structures. The floors were paved with polychrome limestone pavers and marble *opus sectile*. Massive masonry piers supported 6.5m. wide stone arches that flanked the 7.8m. wide nave and carried a clerestory. Ceramic tiles covered the gabled roof over the nave and the shed roofs over the side aisles. The eastern end of the basilica preserves the foundations of chancel screening surrounding the elevated sanctuary. While the marble flooring, newel posts, chancel screening and the altar of the

sanctuary have long been repurposed, an embedded three-object reliquary made from a hard limestone column base and the empty grave of a locally venerated individual remained in the floor of the sanctuary to be uncovered. The southern aisle of the basilica was screened off at the eastern end so as to protect sacred objects on display. The area of restricted sacred space in the basilica covered *ca.* 73m². At the eastern end of the northern aisle, which has collapsed, a well provided access to the water of the reservoir below. The architecture of the structure symbolically connected the initiated to the mysteries of Byzantine Christianity in ways explained to catechumens and unappreciated by most modern visitors.

Auxiliary structures flank the Area G Basilica on the southern and western sides. The eastern and northern sides have no abutting structures as those sides of the basilica are on a precipice. On the south side of the basilica a *ca.* 2.5m-wide hallway provided an unusual point of access/egress through which the speakers and messages proclaimed from the ambo on the south side of the nave could be seen and heard. It is possible that a monastic residential or xenodochial complex may lie to the south through that passage. On the south side of the basilica, a doorway located near the west end of the southern aisle opened into a diaconicon / treasury complex where benefactor’s delivered gifts. Tall, thick windowless walls with no exterior doors, made it a secure space for gathering offerings and valued objects of liturgical equipment and gifts. Gifts in kind such as food were stored there temporarily before distribution to the needy or sale. Bread and wine, chosen for use in the liturgy, were brought in procession from the diaconicon into the basilica and through the nave to the sanctuary for consecration while singing believers celebrated their arrival as part of the liturgy. The southern diaconicon, like the interior of the basilica, was paved with *opus sectile*, and it had marble revetment on the northern wall.

On the west end of the basilica, a *ca.* 3m wide portico partially enclosed by end walls and four columns spaced symmetrically along a 12m opening supported a shed roof. It sloped from the western basilica wall down across the portico towards the atrium. The covered portico



3. Basic plan of Area G ecclesiastical complex locating G-40 inscription. (drawing by Robert W. Smith).



4. View of complete inscription as seen from the south wall of the Area G complex. (Photo by Robert W. Smith).

sheltered the *opus sectile* flooring, doorways, and the marble revetment on the basilica's western exterior, along with the assembling worshippers, from the summer sun and winter rains. To the west, the atrium provided a larger gathering space with perimeter stoas. The eclectic columns and entablature found in the atrium evidence the reuse of architectural elements from earlier pagan monumental construction and at least one uniquely Christian element. The atrium was impeded by the steep hillside to the north, and the presence of a monumental ecclesiastical structure in Area B remains to be completely excavated.

The entrance into the atrium from the city center to the north and other original structures on the north side of the atrium of Area G remain to be discerned. On the south side of the atrium, near the southwestern corner of the portico, a doorway accessed a room secured within the high and thick exterior walls of the complex. That room in excavation unit G 40 is where excavators found the mosaic inscription.

The Discovery of the Inscription

The ashlar-walled, rectangular room (*ca.* 3.45m wide and *ca.* 6m long) at the southwest corner of the Area G Ecclesiastical Complex atrium is the location of the newly discovered mosaic inscription. This room, with its seven preserved courses of tightly bonded, sawn limestone ashlar that needed no mortar, was an integral component of the initial ecclesiastical complex. This secure room, which had a smooth plaster finish on its interior walls, appears to have served as some sort of "ecclesiastical office" or receiving room for visitors. The excavation team largely exposed the room in Square G40 during 2018 going down to what they thought should be the floor level of the

atrium. They concluded that season suspecting that a surface of valuable flooring had been removed from the room in late antiquity, as had been the case in other parts of the complex. In 2023, to make the site more accessible to visitors, balks between squares were removed and previously excavated squares were cleared of stored ashlar. The weeds that had grown up and soil eroded from the balks since 2018 were cleared out of Square G40. In the process the excavators exposed a mosaic inscription along the eastern wall during the second to last day of the excavation season, just a few centimeters below where excavation in 2018 had ceased. The decision was made to leave the exposure of the whole floor to a subsequent season and to extend the excavation 1 meter into the southern balk for a width of 1.25m. The rapid but careful removal of this *ca.* 4m. deep single stratum of soil and intermingled fallen ashlar from the mass-wasting event from inside of the southern complex perimeter wall facilitated the recovery of the complete inscription.

The Inscription

The Area G Mosaic Inscription is a fairly standard Byzantine ecclesiastical dedicatory composition (**Fig. 4**). The inscription formed by black limestone tesserae, is set in an off-white limestone field at the eastern, narrow side of a room that is completely surfaced with a carpet mosaic. The field in which the inscription is set measures 3.43m. long from north to south and 42cm wide from west to east. The orientation of this inscription suggests that, as persons entered through the door from the atrium to the north, the focus of activity in the room was on the eastern end with the inscription and not the south side of the room opposite the door.

The three-line inscription is flanked on both



5. Detail of the "floral cross" symbol used to frame the northern end of the inscription. (Photo by Robert W. Smith).



6. The southern end of the inscription showing the terminal leaf and framing cross. (Photo by Robert W. Smith).

ends by stylized cross-shaped symbols formed with black tesserae. These "floral crosses" fit in an imaginary *ca.* 18cm square box in which the center is a *ca.* 10cm. square of five alternating black and white tesserae with split arms radiating from the corners. Inside the central square, the second row alternates between black and red tesserae creating a red diamond shape that is occupied by a single white tessera. Such tripartite squares are found on mosaics found elsewhere in ecclesiastical mosaics at Abila and may be evidence of a Trinitarian theological statement in a region where Christological doctrine was disputed. The use of crosses on floors is common on the ecclesiastical mosaic floors at Abila and in *Palaestina-Secunda* in spite of pre-inscription and post-inscription Byzantine imperial prohibitions². In this inscription, these cross symbols created a framework reminiscent

2. Habas (2015: 33–60) discusses *Palaestina-Secunda*, where Abila was situated, as a region where the Theodosius II Edict of 427 AD was widely ignored, as was the prohibition against placing crosses where they might be stepped on. This was a continuing issue since the 73rd Canon of the Sixth Ecumenical Council at Trullo in 691 AD reiterated the law and threatened offenders with excommunication.

of the dove-tail-shaped handles of a traditional *tabula ansata* and similarly created a monument (Leatherby 2018 380-404). The lines under the cross-shaped symbols at both ends of the inscription are part of the framework around the carpet mosaic. The inscription appears to have been the last portion of the mosaic floor to be installed and is crammed against the plastered eastern wall of the room, necessitating an intrusion of the inscription into the framework around the main floor design.

The 105 letter *ca.* 11cm / six tesserae-tall majuscule inscription is introduced with a simple Greek cross at the left end of the top line and concludes with a leaf on a twig at the right of the bottom line (Figs. 5, 6). While initial crosses are a common Byzantine Christian convention, the use of a concluding lanceolate leaf with a clearly defined midrib is not common. The text does not indicate word divisions, and it reads:

+επιτουαγιωμνηνεπιφανιουπροεδρου
εκτισθηκδιεκομηθηεκθεμελιωντοσικριτον
ενημαπριλιωνδετουςδοξαοι

Paleographically, the orthography of the inscription is typical of the sixth century AD.

It features a round-oval alphabet with almond-shaped *omicrons* and *thetas* and lunate *sigmas*. The inscription under scrutiny here follows known ligatures and abbreviation techniques. Abbreviations and numbers are indicated with the use of superpositional horizontal lines in lines one and three. The abbreviations and are standard abbreviations for the *nomina sacra*, *πατήρ* and *κύριος*. The abbreviation for *καί* with the insertion of a ligature on the leg of a *kappa* is employed in the second line. The ligature of the *mu* and *eta* in the second line is common. A small *eta* above the standard size *mu* in line three abbreviates the word *μηνί*. An abbreviation for “indiction” with a ligature on a *delta* is employed in the third line. The pronunciation of the diphthong *OI* appears to be indicated by the dots flanking the top of the *iota* in the third line.

Transcription, Translation, and Commentary Line 1

ἐπὶ τοῦ ἁγίου π(ατ)ρ(ὸ)ς ἡμῶν
ἐπιφάνιου προέδρου

“During the time of our holy father,
Epiphanius, the president”

The first line is an ἐπί prepositional phrase. The preposition ἐπί often takes its object complement in the genitive in Koine (Siebenthal 2019: 273–275 and Wallace 1996: 376). The preposition ἐπὶ has three object complements in the genitive which are in apposition to each other in the first line. The noun *πατὴρ* is the head noun, with two appositives (*Ἐπιφάνιου* and *πρόεδρου*).

Ἐπὶ τοῦ in dedicatory inscriptions is formulaic and introduces either the name of the clergyman in charge of the sacred building or that of the bishop in whose diocese the structure was located. In this case, Epiphanius has the title of π(ατ)ρ(ὸ)ς ἡμῶν (“our father”), which has at times been understood to be used for the superior of a monastery³. The adjective ἁγίω is unusual in its form. We would expect the geni-

tive ἁγίου, since it is modifying the genitive π(ατ)ρ(ὸ)ς.⁴ Further identifying Epiphanius is the title πρόεδρος. Sophocles (1900: 925; cf. Papadakis 1991: 1727–1728) offers “president” for πρόεδρος, ου, ὁ, and states that it is equivalent to ἐπίσκοπος (“bishop”).⁵ Liddell (1996: 1476) translates πρόεδρος as “presiding officer, one who sits in the first place.”⁶ While the use of “our father” is used for the superior of a monastery, the use of πρόεδρος for a superior of a monastic community is generally rejected by recent scholarship⁷. The simplest understanding would be that Epiphanius was the local bishop of Abila⁸. The name spelled “Epiphanius” appears rarely in extant inscriptions⁹. The name appears on an undated stone block in a church at Siyagha (Gatier 1986: no. 88). *Ἐπιφάνι(α)ς* is a known name from a rock inscription at Aila, Sinai in the sixth–seventh century AD (Meimaris 1986: no. 120) and from an undated mosaic inscription from *Karmiel* (Kh. Bât es Sih) (Meimaris 1986: no. 911 = Madden 2014: no.

3. In the hermitage of Procapis the term “our father” is listed (; Piccirillo 1989: 172), with the variant of “our father” in the lower Church of the monastery of Kayanos in ‘Uyūn Mūsā dated before 531 AD (Piccirillo 1989: 213). At Al KHattābiyyah church, cf. Piccirillo 1989: 313. The term “Holy Father” may be considered an honorific title employed in monastic context equal to that of “Abba” (Meimaris 1986: 239); for an extensive list of occurrences of “our father” see Meimaris 1986: 246–248.

4. For an example of ω for ου see inscriptions cataloged by Gaiter (1986: no. 46) and Bader (2009: nos. 63 and 323). For other examples of the full formula (preposition + holy + father + our + personal name + title) see Meimaris 1986: nos. 1245 and 1248; Gatier 1986: no. 78, a mosaic in the floor of the chapel of Theotokos in Siyaghah Mt. Nebo (a monastic complex that predates the fourth century but is transformed two times in the 6th century AD).

5. Meimaris (1986: 240) notes that from the fifth century onward it became customary for the superiors to be presbyters, citing Council of Constantinople IV, act 1 (563 AD).

6. Title found on an honorary inscription at Djebel Webdeh in the ruins of the Church of Saint George – Martas was the builder of the Heracleion – he is called an advisor and a πρόεδρος (Gatier 1986: no. 29). Interestingly, the term has otherwise not been found in Byzantine church mosaic pavements from Palaestina or Arabia (Madden 2014).

7. For a recent discussion of “President” and the rejection of its association with monastic leaders, see Obluski 2019: 272.

8. Previously attested Bishops of Abila are Solomon in 518 AD, Nicostratus in 536 AD, and Alexander, who was exiled as a heretic in 553 AD (Vailhé 1912: 1.120). Solomon and Nicostratus are identified with ἐπίσκοπος not πρόεδρος (Mansi, Concil. Ampl. collectio, t.VIII, col. 1074 and col. 1171).

9. The name “Epiphanius” meaning “clearly manifested” was widely used and had been the name of the Patriarch of Constantinople from 520 to 535.

225 [proposes a fifth-century date]]¹⁰.

Line 2

Ἐκτίσθη κ(αὶ) διεκόσμηθη ἐκ θεμελίων τόσι κριτόν

“[It was] created from the foundations and adorned with much green.”

The second line of the inscription begins with two aorist passive verbs, each of which has an impersonal subject. The ἐκ prepositional phrase is a complement of one or both aorist passive verbs (see the discussion below). The preposition ἐκ takes its object complement in the genitive (Siebenthal 2019: 270–271; Wallace 1996: 371–372). The aorist passive form of κτίζω followed by the prepositional phrase ἐκ θεμελίων is formulaic in dedicatory building inscriptions (Gatier 1986: nos. 53, 133, 175; Madden 2014: no. 18). Rare in such inscriptions is the additional terminology of adornment (διακοσμέω). Liddell (1996: 398) provides one reference to a 600 AD inscription in Gerasa for a building being adorned (cf. SEG 37.1541.5)¹¹. The aorist passive form of διακοσμέω also appears in a church belonging to a monastery at Zughrīt near Gerasa, dated 542 AD (Nowakowski 2017)¹². The prepositional phrase ἐκ θεμελίων perhaps modifies both verbs. If the adornment includes the foundations, perhaps this is a way of saying that everything from the ground up is included in the scope of the dedication.

The final two words of line 2 create significant difficulties for translation and for interpretation. The form τόσι is dative of the adjective τόσος, η, ον, “so much, so many” (Sophocles 1900: 1086; see his numerous citations from early Christian literature). Liddell (1996: 1807) says

the term expresses magnitude. As a dative, the final *omega* has elided with only the *iota* remaining, iotacism (i.e., τόσι for τῶσι).

The final word, κριτόν, is particularly troublesome in terms of morphology and contextual meaning. The word could be the noun κριτής, οῦ, ὅ (“judge”); but in this context such a meaning does not work. It could be the adjective κριτός, ἡ, ὄν (“separated, picked out, chosen”, or “choice, excellent,” (Liddell 1996: 997). The translation then would be something like, “it was created and adorned with so many choice (things).” With this option the intent of the expression highlights the magnitude and excellence of the adornment, with the dative τόσι expressing “material.” But, for this to be a viable option we would expect τόσι κριτόν to agree in gender, number, and case, and it does not.

The apparent lack of agreement between τόσι and κριτόν suggests a third option for κριτόν. Κριτόν might be a loanword which has not been nativized and is thus indeclinable. The form itself might be a Greek rendering of a pre-Islamic Arabic or Aramaic word. Scholars have long acknowledged that the Arab culture of the Transjordan was Hellenized. Pre-dating the Umayyad conquest by fifty years, the Petra papyri give some of the best evidence of Arabic words in Greek vocabulary (PP I)¹³. Beyond the Petra papyri, the appearance of pre-Islamic Arabic is quite marginal, with most evidence known from sites located in the eastern third of Jordan, the southern half of Jordan, and the Negev (see fig. 4 in Hoyland 2010 for a map of sites with pre-Islamic Arabic inscriptions). The nearest evidence of pre-Islamic Arabic is sixty 60km to the south-east of Abila, at Umm Al Jimāl (Macdonald 2008: no. XIII)¹⁴. Because the corpus of available texts with pre-Islamic Arabic is scant, at this time there are no known contenders for a pre-Islamic Arabic word being

10. At least two different individuals with the name Ἐπιφάνιος appear in the Petra Papyri. Ἐπιφάνιος, the son of Damianos, is identified as a πρεσβύτερος (PP I: no.6 and PP V: no.55). The other Ἐπιφάνιος is the bother of Bassos and Sabinos (PP II: no.17). The name Ἐπιφάνιος also occurs with no further identification (PP V: no.64).

11. An inscription in a church at Birsama (H. Beer Shema; Kh. El-Far) says οἱ γιοι κοσμοῦνται, “saints are adorned” (Madden 2014: no.49).

12. The verb κοσμέω without δια is found at two sites. A chapel at Eleutheropolis (Beth Guvrin; Beit Jibrin) is adorned (κοσμέω) “with mosaics” (Madden 2014: no. 76). The church of Dominus Flevit on the Mount of Olives is adorned (κοσμέω; Madden 2014: no. 116).

13. Francis Gignac produced a volume demonstrating how Coptic and its dialects interfered with Greek, as evidenced by the non-literary papyri of Egypt (Gignac 1976). As of 2015 there is a single pre-Islamic Arabic text composed in Greek letters, labeled A1 (Al-Jallad and al-Manaser 2015).

14. For a thorough phonological discussion of pre-Islamic Arabic in light of other Semitic influences (e.g. Aramaic) and Greek, see Al-Jallad 2015. For an overview of the linguistic interference between Aramaic and Arabic see Retsö 2006: 178–182.

written in Greek letters corresponding to κριτόν. Likewise, Arabic lacks an obvious cognate to the Semitic *krt* “to cut”, but it does have *qt* (قطع), *qtm* (قطم), and *qtt* (قطط), all meaning “to cut.”

The root *krt* is common in other Semitic languages (e.g. Hebrew (Brown *et al.* 1980: 503–504 and Koehler and Baumgartner 1995: 2.500–501), Phoenician-Punic (Krahmalkov 2000: 243–244), and Akkadian [see *karātu*; CAD 8:215 and Tawil 2009: 174]) and in all cases means “to cut.”¹⁵ In this case, then, the lexeme in the inscription could be translated “cut things/pieces.” The final *nu* on κριτόν could be the Semitic diminutive particle (-*on*-, which would potentially be either -*ων* or -*ον* when transliterated into Greek)¹⁶. The lexical meaning with a diminutive particle could be “little cut pieces” with the dative of material, resulting in the phrase “with many little cut pieces.” This solution seems to be an awkward way to refer to mosaics considering other inscriptions that utilize specific vocabulary for the laying of mosaics.

An Aramaic dialect appearing in the region is Christian Palestinian Aramaic (CPA)¹⁷. Most of what is known about CPA comes from Greek inscriptions. One example of a sixth-century church mosaic with CPA is located a few kilometers south of Abila, at Al Burz (Khasawneh 1994: 21–29 and Puech 2003: no. 3). In Aramaic the adjective כְּרִיתָן *karātān* is used to describe drapes or hangings that are green in color (Targum on Esther 1:6). The adjective *karātān*

is related to the noun כְּרִיתָן *karāt* (“leek”)¹⁸. If we read κριτόν as an Aramaic loanword, then the translation is something like, “[It was] created and adorned from the foundations with much green.” If we favor this solution for κριτόν, perhaps we should read the line as an A-A’-B-B’ pattern. The B prepositional phrase serves as a complement of the A passive verb, while the B’ phrase serves as a complement to the A’ passive verb. The resulting translation would be, “[It was] created from the foundations and adorned with much green.” Reading κριτόν as an indeclinable loanword would explain the seeming lack of agreement between the dative τόσι and the form κριτόν, which looks like an accusative. A difficulty with this proposal is that Greek has a common word for “green” (χλωρός - ἁ - ὄν, e.g. Mark 6:39). It is possible that the mosaicist only knew the local Semitic vernacular for “green.”

Line 3

ἐν μηνὶ (νὶ) ἀπριλίῳ ἰνδ(ικτιῶνος)
, ἔτους . (κύριε) δόξα σοι.

“in the month of April, the 13th indiction, the year 643 [= 580 AD]. Lord, (be) glory to you.”

The third line is an ἐν prepositional phrase that is functioning temporally. The ἐν preposition takes a complement in the dative (Siebenthal 2019: 271–273; Wallace 1996: 372–375). The abbreviated ἐν μηνὶ is the most common augmentation of ἐν μηνὶ (“in the month”) used by mosaicists¹⁹. In considering the distribution of the various occurrences, ἐν μηνὶ is overwhelmingly the preferred spelling in the Era of the Province of Arabia (E.P.A.) region – 26 examples compared to 10 for the

15. For the root *krt* in northwest Semitic, see Hoftijzer and Jongeling 1995: 538–539.

16. For -*on* as a diminutive in Hebrew and -*un* in Syriac, see Kautzsch 1910: §86g.

17. CPA shares many characteristics with Jewish Palestinian Aramaic (JPA) and the classical period of Samaritan Aramaic (SA). The modern scholarly literature uses several names for CPA, including Palestinian Syriac, Jerusalem Syriac, or Melkite Aramaic. For a brief overview of the dialect see Morgenstern 2011: 628–637. For a good discussion of the status of CPA inscriptions throughout modern Jordan, see Hoyland 2010. For כְּרִיתָן “leeks” and כְּרִיתָנון “leek” in JPA, see Sokoloff (1990: 270).

18. The same root *krt* appears in Syriac, Jewish Babylonian Aramaic, and Mandaic. Sokoloff (2009: 657) says that the Syriac word is a loanword into Mishnaic Hebrew and Arabic, and he provides a citation of the derivative in a phrase translated as “leek green curtains.” The lexeme *karāšu* “leek” appears in Akkadian (CAD 8:212–214). This Akkadian lexeme can describe stones that are colored green comparable to the color of leeks. The phoneme *š* merges with *t* across the Semitic languages. Thus, the root *krš* in some Semitic languages can correspond to the root *krt* in other Semitic languages relating to a “leek.” For the phonemic merger between *š* and *t*, see Johns 1972: 5; Rendsburg 1997: 69–70; and Gzella 2013: 2.854.

19. Using the index to Meimaris’s (1992: 425–426) catalog of inscriptions.

“Pompeian” Era (P.E.) region²⁰. Even though the dating system used at Abila is P.E., perhaps this particular augmentation is a result of influence from E.P.A. mosaicists. Meimaris (1992: 160) says that the province of Arabia expanded over the centuries; Abila is on the border between the regions of P.E. and E.P.A. Even though the augmented prepositional phrase for “in the month” is favored in E.P.A., the use of Roman month names is rare for E.P.A. dates (Meimaris 1992: 157). The dative Ἀπρίλιῳ (ἄπρίλιος) is attested (Meimaris 1992, E.P.A. no. 240). The genitive form, ἔτους is late and very rare, having been replaced by the dative (Meimaris 1992: 92). The mosaicist follows the standard convention of rendering the numerals in Greek letters in ascending order (units, tens, hundreds).

The era employed in the Abila Area G Church inscription is the Pompeian Era of 63 BC. This era is evidenced in the sixth-century Abila Water Tunnel Inscription and second-century Abila Pilgrimage Complex inscriptions (Smith *et al.* [forthcoming]). Thus, the Abila year 640 is the equivalent of the year 580 AD/43 BH (643 Abila Era – 63 = 580 AD).

The final clause of the line is a prayer directed to the Lord (vocative).

There are several interesting linguistic details in this inscription. Abbreviations appear in each line of this inscription. Most of the abbreviations involve nominal forms, but the conjunction καὶ is also abbreviated in the second line. There is a modified form of the genitive in the first and another modified form of a dative in the second line. Finally, there is a potential Semitic loanword in the second line.

Background and Secondary Proposal for “President Epiphanius”

The term “president/προέδρος” does not appear in the titles of congregational leaders found in the texts of the New Testament describing the primitive church. Congregational leaders who directed ecclesiastical activities called “president” appear in Justin Martyr’s

mid-second-century description of Sunday gatherings of Christians. In such meetings, the Scriptures were read and the assembled persons were exhorted to make application by the “president,” who subsequently led in Eucharistic prayer and supervised the collection and distribution of offerings to the needy (*First Apology* 1.67). Justin Martyr’s description fits with the shift in polity from the collegial, congregational leadership of multiple ἐπίσκοποι in the Apostolic Church towards the increasingly adopted mono-episcopacy of the mid-second- and third-century church. Eusebius of Caesarea in the fourth century occasionally refers to “presidents” in his writings. In ecclesiastical contexts, these references normally refer to persons consecrated as bishops over an eparchy. The term “president” could further refer to a bishop who led in a synod /assembly of other bishops, or it could be associated with bishops who may have been assigned an expansion of their jurisdiction. When the fifth-century historian Sozomen, from Palestine, described the biblical instruction of a Eusebius of Hims Emesa who came to be consecrated as a bishop embroiled in the Arian theological controversy, he asserts Eusebius of Emesa was taught by “Eusebius Pamphilus (of Caesarea) and Patrophilus, the president of Scythopolis” (Sozomen, *Church History* III.6.2).

In the early part of the fourth century, when the the education of Eusebius took place, Scythopolis was not a regional capital. By the turn of the fifth century, when Sozomen wrote, however, the city had become the metropolis of *Palaestina-Secunda*. Perhaps Sozomen retrojected a later title of the Bishop of the Metropolitan city of Scythopolis onto Patrophilus. Such a use of the term “president” is seen in the 39th Canon of the 692 AD Council of Trullo, in which John, the “president” of Cyprus, is given metropolitan authority over a new set of congregations and their bishops when his flock flees the island in the face of Islamic advance. This raises the interesting possibility that the Epiphanius mentioned in the Abila inscription could be the metropolitan bishop of Scythopolis who was serving either in the absence of a consecrated bishop of Abila or superseding the Abila bishop. The last attested Bishop of Scythopolis is Theodore in 553 AD

20. An even greater disparity exists between E.P.A. and P.E. inscriptions with the even shorter augmented form εν μ. Thirteen inscriptions use εν μ in E.P.A. but only one inscription (from Gaza #139) uses εν μ (Meimaris 1992: 426).

(Avi-Yonah 1963: 325326). If Epiphanius was not the bishop of Abila, as is most likely, it would be possible that he could have been the president of Scythopolis, the Metropolitan See.

Conclusion and Implications

The Abila Area G Inscription identifies the construction and outfitting of the related complex at a time when Emperor Tiberius II Constantine was embroiled in the long-term conflict with the Sassanid empire in the East. Local leadership promoted the continued expansion and adornment of ecclesiastical establishments undertaken at Abila following the mid-sixth century calamities. If the venerated presiding cleric, Epiphanius, mentioned in the inscription was indeed the Bishop of Abila in 580 AD, his name extends the line of local episcopal succession. If Epiphanius was instead the Metropolitan of Scythopolis, his name would extend the succession line of that city's bishops beyond Theodore, a survivor of the same Origenist controversy that had led to the exile of Abila's bishop Alexander.

The Abila Water Tunnel Inscription found in 1984 (Fig. 7) and the name of the Bishop who ordered that critically important public works project in 568 AD was not able to be discerned by the former excavation epigrapher Bastiaan Van Elderen (1989), or now by others who have scrutinized the deteriorating text. The lacuna in the first line of the inscription is long enough for a variety of possibilities, including "Epiphanius." Only the discovery of an additional dedicatory inscription at Abila is likely to absolutely resolve, first, whether the presiding Epiphanius under whom the adornments in the Area G Ecclesiastical Complex took place was the Bishop of Abila or the Metropolitan of *Palaestina-Secunda* from Scythopolis; and, second, if Epiphanius contributed to other significant projects such as the water-system restoration and the Area E Pilgrimage Complex enlargement that had taken place twelve years prior to the construction of the Area C Ecclesiastical Complex.

An interesting possibility raised by the inscription found in the Area G Ecclesiastical Complex is that the person who was buried in the grave found in the floor of the sanctuary could have been a venerated local cleric such

as "Epiphanius." If that were the case, it is possible that during the seventh and early eighth centuries, before the earthquake of 749 AD, the Area G Ecclesiastical Complex could have been known as "Saint Epiphanius Church."

The Area G Ecclesiastical Complex inscription discovery, like the results of previous seasons of work in the complex, raises questions for further exploration. A clear answer it gives is an absolute date for when the tessellated floor of the room in the Area G Ecclesiastical Complex was installed. The inscription also clearly adds to the names of local religious leaders of the sixth century.

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7. Abila Water Tunnel Inscription. (Photo by Sufyan Al Karameh)

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A PRELIMINARY REPORT ON THE 2018 SEASON OF EXCAVATION AT ABILA OF THE DECAPOLIS

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Abila was a Decapolis city just 12 Roman miles east of Gadara (Umm Qays). The site evidences its most substantial occupation in the Late Roman, Byzantine, and Umayyad periods. However, since the 1980s stratified remains have been excavated indicating nearly continuous habitation from the Early Bronze (EB I) to the Abbasid period (with some reuse of the site in the later Islamic periods as well)¹.

The central goals for the 2018 season of the Abila Archaeological Project were: (1) To deepen the excavation in key squares in Area AA on the North *tall* in order to examine how the Byzantine, Hellenistic, Iron Age, and Bronze Age habitations extended east and north on Tall Abīl; (2) to continue the excavation of two Byzantine churches (Areas G and E) in preparation for publication and for better presenting the churches for tourism; and (3) to excavate a presumed “marketplace” in the area adjacent to the basalt road in what we call Area B. The staff during our 2028 season consisted of 8 senior staff members, 24 student volunteers, and also two department representatives, four guards, and 60–70 local Jordanian workers, mostly from the village of *Ḥarthā*, where the team stays in the *Ḥarthā* Girls Secondary School at the kind invitation of the Ministry of Education office for the Banī Kinānah District.

Area AA (Fig. 1)

Area AA was supervised by Dr. Susan Ellis with the assistance of Mr. Kevin Morrow, who

was the Assistant Area Supervisor, as well as the following student volunteers, who were Square Supervisors: Lynn Khadija, Jed Scott, Abagaile Usselton, Brian Ediger, Haaron Ahmed, Noah Maxwell, Denver Lego, and Kari Miller. Area AA represents the history of Tall Abīl from the Abbasid to the Early Bronze period². Goals in Area AA for the 2018 excavation season included continued excavation of the Early Bronze period in Square 5 and further excavation toward understanding the relationship of the various walls in AA to determine the process of settlement, especially the two massive walls that run N/S that were uncovered during our 2016 season of excavation. Excavated areas are located at latitude 32.68251 and longitude 35.86842.

The fortified wall, which bisects squares 9, 10, 11, 16, 22, and 25, was uncovered and traced down through 2.3 meters, though the bottom of the structure was not reached. Further excavation and study during our 2020 season will hopefully give evidence of the use of the structure and the possible dates of construction. At present, pottery findings seem to indicate a date of construction during the Hellenistic period or possibly Iron Age; however, more excavation is needed to determine a firmer dating.

Excavation in Area AA also pursued our understanding of the early settlement of the

1. For an overview of the site see: W. H. Mare, “Abila (of the Decapolis),” *The Oxford Encyclopedia of Archaeology in the Near East* (New York: Oxford University Press, 1997).

2. The excavation of Area AA on the north *tall* has progressed every season since 1994. A history of the excavation of this area in the early seasons can be found in John Wineland, *Ancient Abila: An Archaeological History* BAR Intl. Series 989 (Oxford: Archaeopress, 2001), *ad. loc.*



1. Area AA.



2. Area AA bedrock.

site as revealed in Square 5. In this square, one plaster and one hard-packed soil floor surface were discovered, both of which were drawn, photographed, and removed. Our goal was to continue down to bedrock, which had been reached during our 2016 excavation season in an adjacent square, but we were not able to achieve that goal during this excavation season. We believe that we have approximately 70cm left until bedrock and are hopeful that this goal can be achieved during our 2018 season. Pottery from Square 5 was almost 100% Early Bronze, including some small pieces of KHirbat

Al Karak ware from the upper layers. Out of hundreds of sherds, 12 were intrusive Middle Bronze. Overall, our excavation in Area AA was successful and we were able to achieve most of our goals for this season. Seven members of the international staff worked in Area AA and an additional 14 Jordanian workers helped us in this work.

Area B

After a hiatus of 12 years, 2018 was our second season excavating in Area B, which was under the supervision of Ms. Cheryl Eaton, ABD. The Assistant Area Supervisor for this area was Dr. Blake Hartung, and student volunteers were Liz Bennett, Ethan Stafford, Nathan Wertjes, Olivia Waldron, Kat Caldwell, Rachel Jacob, Emma James, and Brooke Taylor. The excavated squares in this area are located at latitude 32.68098 and longitude 35.8689.

Excavation of Area B, which began in 1986 under the late Dr. Bastiaan van Elderen, was suspended after the 2004 season supervised by Maria Deutchmann and resumed in 2016 under the supervision of Cheryl Eaton. Although the theater cavea suggested by the semicircular shape of the northeastern slope of Umm Al 'Amad never materialized, excavation over the 10 previous dig seasons have uncovered installations representing several periods of occupation.

Seasons 1986–2004

Findings of previous dig seasons include: 1) a massive Roman facade on the northeastern slope; 2) a north-south limestone street, preliminarily dated to the Roman period, with adjacent walls and plaza extending from the hillside at the east side of the area; 3) a northwest-southeast basalt street overlying the limestone street and preliminarily dated to the Byzantine period; and 4) a large building immediately north and east of the northeastern slope of Umm Al 'Amad that was preliminarily identified as an Islamic structure of the Umayyad period but has an eastward-facing apse and other features indicative of monastic structures.

Season 2016

Excavation in 2016 opened three squares

(54, 55 and 56³) on the steeply sloping ground immediately west of the basalt street. The goal was to further explore the basalt pavement, even with the street curb and secondary east-west cross-walls (partially excavated in 1992), and further expose a well-built, north-south wall running parallel to the street and abutting the cross-walls on the west, all of which suggest a marketplace, with shops bordering the west side of the street. Probes in each square (given the brief dig season of thirteen days in the field with Jordanian workers) further exposed the east-west cross-walls and located the north-south wall and western end of the basalt pavement.

2018 Goals Fully Met

Left by necessity for the 2018 season was the goal of more fully exploring the suggested marketplace by completing the excavation of Squares 54, 55, and 56, located on the west side of the basalt street. The first two were expanded 5m east to reach the street, and a new square, 57, was opened immediately east of Square 56. This new square aligns with Squares 54 and 55, abutting the street. The goal to further explore the basalt pavement and well-built, north-south wall (described above) was fully met. Finds this season included a number of special objects that support the suggestion of a Late Byzantine/Umayyad marketplace, including a glass shard with a stamped Arabic inscription, an intact oil lamp, and an intact jug (see further, below).

Meanwhile, the basalt road was cleaned of soil, boulders, columns, and other accumulated debris to aid in interpretation and to help prepare the area for tourism. The columns, which had been removed from the street, and undamaged limestone ashlar, which were removed from the tumble in each square, were preserved and stacked on site for use in future reconstruction.

Assisting Eaton for the 2018 season were Supervising Assistant Blake Hartung and staff members (in alphabetical order): Liz Bennett,

Rachel Jacob, Emma James, Ethan Stafford, Brooke Taylor, Olivia Waldron, Nathan Wertjes, and 14 local Jordanian workers. Staff members Marissa Johns and Lexie Graft joined the Area B team to help on the two final days. Excavation of the squares occurred June 20–July 12.

Elevation Procedure

In 2016, beginning elevations of the squares were ascertained using as a zero-datum point the northeast corner of the slightly jutting basalt curb immediately east of the partially uncovered east-west cross-wall between Squares 54 and 55. The elevation for the northeast corner of the cross-wall was determined to be 171cm, with the northwest and southwest corners of Square 54 at 322cm and the southeast and northeast corners of the square at 250.5cm. Using the elevations for Square 54, the beginning elevations for Squares 55, 56, and 57 were also determined, with 45cm added to the elevation of Square 56 and the newly opened Square 57 to account for the slope of the basalt road up to Squares 55 and 54 using the zero-datum point. The accuracy of these elevations were confirmed this season using an optical level and stadia rod, and they will be reconfigured at a later date based on a base elevation for the site taken in a previous season.

Square 54

Supervising the excavation of Square 54 were Liz Bennett (returning from the previous season) and Olivia Waldron. Of the three squares opened just west of the Byzantine basalt street, Square 54 is located the farthest north, closest to the modern east-west access road, which is located about 6m north. In order to provide an eastern balk in the steeply sloped terrain, the north-south sides of Square 46 were laid out a half meter shorter than the 4m east-west sides. During the 2018 season, the square was expanded 5m east through the former eastern balk, a secondary north-south wall (with *loci* numbered for purposes of stratigraphical identification), to meet the basalt street.

Last season, the beginning elevations for the northwest and southwest corners of Square 54 were 322cm, with the southeast and northeast corners of the square at 250.5cm. Excavation of the original portion of the square ended with

3. The squares have been renumbered from season 2016 after the 2004 season records were located in early 2018 at the Mare Institute of Biblical and Archaeological Studies in St. Louis, Missouri, USA. (Squares numbered in 2016 have been renumbered as follows: 46=54; 47=55; 48=56.) Dr. W. Harold Mare was killed in a car accident in the middle of the 2004 excavation season, and the Area B 2004 season records had evidently been misfiled.

the discovery of closely fitted pavers (elevation 28cm) roughly level with the basalt curb to the east abutting the street. Ending corner elevations for this season (July 12) in the original square were 29cm northwest, 28cm southwest, 28cm southeast, and 29cm northeast; and those for the eastern extension were 26cm northwest, 28cm southwest, 21cm southeast, and 22cm northeast (**Fig 3**).

Highlights

Jug Discovered

On June 28, a largely intact jug was discovered, missing only two relatively small pieces of the neck (*locus* 019, elevation 170cm [this coincides with intact lamp discovered in Square 55; see below]; Special Object #007). Measuring 11cm from lip to base, the jug would be categorized⁴ as very short, with a thickened, everted lip, a rim-to-shoulder vertical strap handle, a ribbed 6cm-long neck, and an omphalos base. It has a minimum mouth diameter of 6cm and a maximum body diameter of 11cm. Its red-orange color is evident beneath heavy lime encrustation; thus it has characteristics of both Late Byzantine and Umayyad ware and is difficult to date⁵. Associated pottery includes potsherds dating from the Early Byzantine (7) and Late Byzantine (11) periods (**Fig 4**).

Other Items Discovered

Also discovered were (1) the carved end of a bone stylus measuring 5cm in length (*locus* 018; Special Object #003); (2) a partial (split semicircular) carved bone tool handle (*locus* 018) measuring 10.5cm in length and 3cm in diameter; and (3) a non-ornamental copper ring measuring 2.5cm in diameter (*locus* 024, Special Object #008).

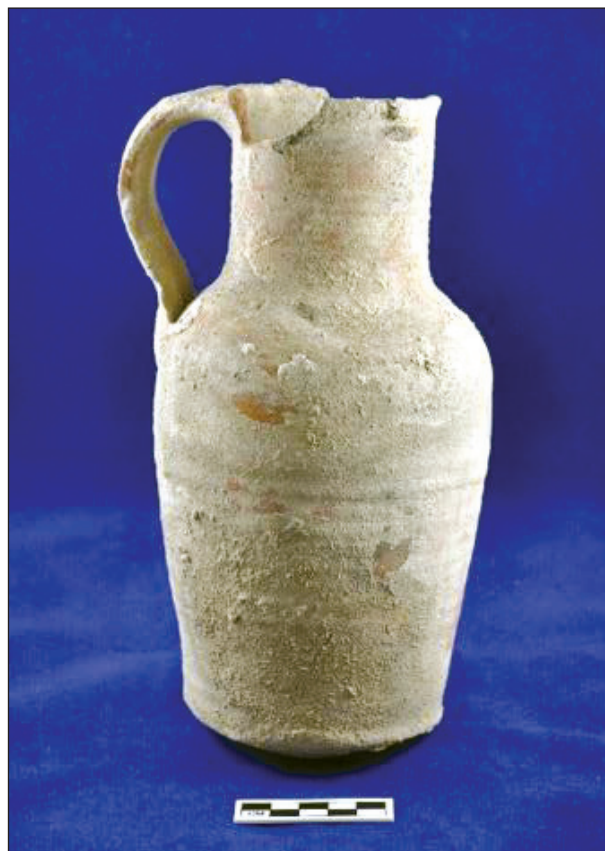
Curving Secondary Wall Uncovered

On July 28, a secondary wall constructed of boulders and pieces of limestone ashlar was

discovered (*locus* 017, elevation 170.0cm) running along what might be best described as the northwestern quadrant “border” of the original square, running east from the western balk and curving north into the northern balk, which abuts the east-west access road to the north. The relationship between the wall and basalt street would be more easily determined with excavation of the access road, which is not possible at this point in the dig for practical purposes, and with the opening of a square in the steeply slopped terrain immediately west of Square 54.



3. Square 54 from east with basalt street



4. Intact jug with omphalos base (B54019, S.O. #007).

4. Categorized based on descriptions given in Ralph E. Hendrix, Philip R. Drey, J. Bjørnar Storfjell, *Ancient Pottery of Transjordan: An Introduction Utilizing Published Whole Forms* (Berrien Springs, MI: 1996), 11–55.

5. The form, ware, and associated pottery indicate Late Byzantine, but characteristics of the two periods overlap and the jug is very similar to the artist's rendering and “very short” description of an Umayyad jug discovered at Jarash: No. 412 in Hendrix, *Ancient Pottery of Transjordan*, 264.

Square 55 (Fig. 5)

Supervising the excavation of Square 55 were Rachel Jacob and Brooke Taylor. The square, measuring 4m by 4m, is located just west of the Byzantine basalt street between Square 54, immediately to the north, and Square 56, immediately to the south (with a 1m balk separating each square). During the season, the square was expanded 5m east through the former balk, part of a secondary north-south wall that continues north into Square 54 (with *loci* numbered for purposes of stratigraphical identification) to meet the basalt street.

Beginning elevations of the square corners for the 2016 season were 323cm northwest, 365cm southwest, and 240cm for the southeast and northeast corners. Ending corner elevations of the original square (July 12, 2018) were 277cm northwest (top of north-south wall [see further below]; 16cm just east of wall), 12cm southwest (east of north-south wall), 20cm southeast and 27cm northeast; and for the eastern extension were 15cm northwest, 18cm southwest, 15cm southeast and 15cm northeast.

Excavation last season uncovered the top of a secondary north-south wall (*locus* 002, elevation 300cm) running parallel to the basalt street along the western balk and aligning with



5. Square 55 from east with basalt street.



6. Glass shard possibly from decanter with stamped Arabic inscription (B54024, S.O. #014).

the lower well-built north-south wall described above (see “Goals Fully Met”). The portion of this secondary wall that lies within the square was fully uncovered this season. Fashioned from boulders and repurposed limestone ashlar, it uses the well-built north-south wall as a foundation. Also fully uncovered was an east-west cross-wall discovered last season (*locus* 004, elevation 250cm) running through the center of the square and extending toward the northwest-southeast basalt street. The wall also appears to be secondary, given the use of boulders and repurposed limestone ashlar.

Highlights

Stamped Glass Shard Discovered

On July 5, excavation uncovered a glass shard featuring a 1.75cm long by 1.5cm wide stamp with an Arabic inscription (*locus* 024, elevation 54cm; Special Object #014) (Fig. 6). The stamp is located on the inwardly folded lip of what seems to have been a decanter with a straight, vertical rim, a partial conical v-shaped neck, and a minimum mouth diameter of 3.5cm⁶. The Arabic inscription may indicate the artifact dates from the Umayyad period. Associated pottery includes potsherds dating from the Early Byzantine (one), Late Byzantine (33), and Umayyad (nine) periods.

Kohl Applicator Discovered

On June 28, a 9.5cm bronze wand in two pieces with a 1cm flat, circular end was discovered (*locus* 020; elevation 105cm; Special Object #005). The object appears similar to applicators for *kohl* eye makeup discovered in Saudi Arabia⁷. Associated pottery includes potsherds dating from the Early Byzantine (two) and Late Byzantine (six) periods.

6. Note that the lip, rim, and neck profiles and inflections and the artifact interpretation given above are based on identifying characteristics of clay pottery in Hendrix, *Ancient Pottery of Transjordan*, 11–15, 20, 54–55.

7. Additional information concerning the Saudi Arabian artifacts mentioned above was not immediately available. Further research will be conducted to confirm identification tentatively made by an internet search that uncovered an article posted by Pitt Rivers Museum Virtual Collections, University of Oxford, “Applicators for *Kohl*,” n.p. [cited July 13, 2018]. Online: <http://web.prm.ox.ac.uk/bodyarts/index.php/temporary-body-arts/cosmetics/81-applicators-for-kohl-three-bronze-applicators-sudan-or-chad-silver-and-bronze-spoons-saudi-arabia.html>.

Coin Discovered

On July 10, a 1.5cm-diameter coin was discovered (*locus* 028; elevation 29.0; Special Object #018). Further cleaning and research may provide more information about the coin. Associated pottery includes potsherds dating from the Early Byzantine (67), Late Byzantine (114) and Umayyad (19) periods.

Intact Oil Lamp Discovered

On June 27, an intact oil lamp was discovered (*locus* 018; elevation 169.0 [this coincides with intact jug discovered in Square 54; see above]; Special Object #004). Measuring 10cm long by 6.75cm wide by 3cm high, its form and color (dark orange) indicate it dates from the Late Byzantine period⁸. Associated pottery includes potsherds dating from Early Byzantine (41), Late Byzantine (54), and Umayyad (2) periods, although it also contains those from the Abbasid (25) period.

Square 56 (Fig. 8)

Supervising the excavation of Square 56 were Blake Hartung (returning from last season to serve as Assistant Area B Supervisor) and Emma James. The square, originally measuring 4m by 4m, is located just west of the Byzantine basalt street, immediately south of Square 55 on the most steeply sloped terrain of the three squares excavated in 2016. During the 2018 dig season, the southwestern half of the square was expanded to the north by roughly 1m with the removal for safety reasons of a large, damaged ashlar and large boulders.

Beginning elevations for the 2016 season of the square corners were 426.5cm northwest, 424.5cm southwest, 239cm southeast, and 297cm northeast. Ending corner elevations (July 12, 2018) of the eastern half of the square (not including the well built north-south wall in the western half; see further below) were 48cm northwest, 48cm southwest, 43cm southeast, and 44cm northeast.

On June 26, excavation uncovered two closely fitted ashlars in the western half of the square, followed by a third on July 2, which further excavation revealed to be the top of the

well-built north-south wall (*locus* 019, elevation 108cm), originating south of the square. More of the wall was uncovered as excavation progressed throughout the remaining season and ended with the discovery of a ledge (*locus* 037, elevation 55cm) also featured in the portion of wall originating south of the square. Excavation ended July 12, after the discovery of a thin plaster floor (*locus* 034) laid over a series of pavers in the eastern portion of the square (*locus* 036, elevation 46cm at center).

The opening of two additional squares immediately south of Squares 56 and 57 in Season 2020 is expected to uncover more of the wall and provide better insight into the relationship between the two squares.

Square 57 (Fig. 9)

Supervising the excavation of Square 57 were Nathan Wertjes and Ethan Stafford. The square was opened at the beginning of the season to better understand the relationship of Square 56 to the basalt street. Beginning elevations of



7. Intact oil lamp found at level of jug in Square 54 (B55018, S.O. #004).



8. Square 56 from south with Square 57 and basalt street at right and above right, respectively.

8. Based on the interpretation of Abila ceramicist, Dr. Susan Ellis, though she noted the overlap between Late Byzantine and Umayyad form and ware.

the square corners were 381.5cm northwest, 379.5cm southwest, 194cm southeast, and 252cm northeast. Ending corner elevations of the full square (July 12, 2018) were 28cm northwest, 24cm southwest, 28cm southeast, and 24cm northeast. During the excavation season, the balk between Squares 56 and 57 was removed to reveal a poorly constructed, north-south secondary wall. Construction materials included broken ashlar, boulders, and half of a grindstone. Also uncovered was another secondary wall beginning at the southeastern edge of the square running north-south atop the basalt pavement and adjacent to the basalt street to the east. The wall, built of repurposed, broken ashlar, includes what appears to be a doorway on the northeastern edge of the square.

Excavation ended July 5 when the level of the basalt curb was reached. As with Square 56, it is believed that opening two additional squares immediately south of Squares 56 and 57 in Season 2020 will uncover more of the wall and provide better insight into the relationship between these two squares.

Interpretation

The excavation of Squares 54, 55, 56, and 57 has revealed a row of at least three adjacent installations abutting the basalt curb, with east-west cross-walls located between Squares 54, 55, and 57, though partially hidden in the balks. The layout is similar to that of Roman-, Byzantine- and Umayyad-period market areas, which have been excavated in neighboring Decapolis cities, such as Jarash and Umm Qays. This, coupled with the variety of items discovered in Squares 54 and 55—including a glass shard with a stamped Arabic



9. Square 57 from east with the basalt curb.

inscription, an intact oil lamp, an intact jug, a stylus, and a coin; a support the suggestion that shops were located along the basalt street dating at least (given the associated pottery) from the Late Byzantine/Umayyad periods. Further excavation is expected to confirm this interpretation.

Future Excavation

Continued excavation of Area B is necessary to advance the study not only of Abila and other Decapolis cities but also of other ancient city plazas and marketplaces. Moreover, further exploration of what appears to be an Umayyad-period monastic structure promises to make an invaluable contribution to our understanding of the relationship between early Islamic and Christian communities. As noted last season, careful planning and continued security during the off seasons could help Area B become a jewel in Abila's crown and a valuable asset among Jordan's already rich trove of archaeological treasures and tourist destinations. Recommended goals for the next dig season (summer 2020) are:

- Two new squares (58 and 59) should be opened immediately south of Squares 56 and 57 to further expose the well-built north-south wall and the relationship of the proposed squares to the adjoining basalt pavement and street to the east.
- The previously excavated square immediately south of proposed Squares 58 and 59 should be uncovered to fully expose the north-south wall and the suggested market place on the west side of the basalt street in Area B.
- The balks between Squares 54, 55, 56, and 57 and proposed Squares 58 and 59 should be removed.

Recommendations for more far-ranging goals include:

- A system to contain erosion and tumble from the steep northeastern slope of Umm Al 'Amad should be employed within the next two seasons, possibly using wire-mesh netting similar to that used at other sites prone to rockfall.
- With the above system in place, the Umayyad-period monastic structure should be fully excavated.
- The well-preserved basalt street, unique for

its winding character, should be uncovered across the modern east-west access road and through the Area C Roman Bath complex.

Area G

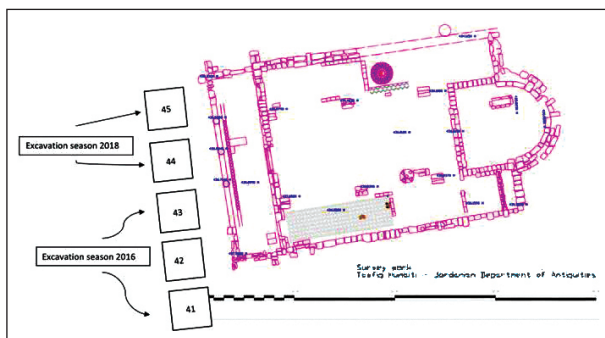
The church complex (Area G) (**Fig. 10**) located at the northeastern end of the southern *tall*, KHirbat Umm Al ‘Amad, was significant to the Christian community during the Byzantine period of Abila’s history. This area has been supervised by Dr. Adam Chambers, with the assistance of Assistant Area Supervisor Mr. Peter Hellman. Square Supervisors in this area were Josh Krontorad, Scott Turnbull, Marcos Wilson, Maroun el-Houkayem, J.D. Cory, Selena Fincher, Vashti Smith, and Elizabeth Pace. The 2018 season of excavation at Area G focused on the expansion of work to uncover the atrium or courtyard space at the western entrance of the basilica. The previous season of excavation opened Squares 41, 42, and 43 with the intent of identifying the nature of the flooring and architectural features that comprised the narthex, or entrance space, leading up to the basilica complex from the west. In similar basilica complexes in the region, such as those at Gerasa and Gadara, access to the inner areas of the church was limited to those initiated into the church through proper rites and rituals, allowing close proximity to the altar space where Eucharist was celebrated. Those who did not belong or who were in the process of being initiated into the local fellowship of the church were expected to remain in the outer, less sacred, areas of the facility.

The focus of this season’s efforts was to open two more squares to the north of those of the previous season to better understand the nature of this entrance space that has tentatively been identified as an atrium, or courtyard. A common

pattern encountered in previous seasons of excavation, particularly with the structures immediately adjacent to the south and west of the main sanctuary, was either extensive secondary construction or building that occurred after the original church was destroyed by an earthquake (probably in AD 747), by migratory occupants who utilized the fallen building debris from the church, and nearby structures, to construct rooms and other spaces.

Square 44 (Figs. 11, 12)

An excavation unit was opened to the north of Square 43, which had been excavated in the 2016 season. Square 44 was excavated under the supervision of Selena Fincher and J.D. Cory. The initial work involved the removal of several strata of fill and debris (001, 002) that had accumulated primarily from the erosion of the *tall* that rises directly to the west of the basilica. Pottery from these fill layers generally spanned a range from Roman to the Islamic periods, reflecting the predominant occupational periods of this part of the *tall*. The destruction stratum (003) was encountered following the removal of the fill layers with large picks and careful soil extraction. The matrix of this layer was characterized by fine sediment to large stone fragments, some with clear architectural features, including parts of columns that appear to have fallen from the bases uncovered in previous excavation in adjacent areas to the east. It was hoped that the remnant of a colonnade suggested the presence of an atrium or courtyard directly east of the church, but this remains to be seen in Square 44. Due to constraints of time, only the western half of the square was excavated down to the floor (011). Instead of tessellated flooring, as was encountered in adjacent spaces, only a plaster surface remains in the excavated portion. It appears that the fallen column debris and several limestone ashlar blocks that clutter the exposed parts of the strata were remains of the destruction of the basilica. At this point, there does not appear to be any secondary reconstruction in this space, as had been the case with much of the adjoining spaces to the south of the square.



10. The church complex (Area G).

Square 45 (Figs. 13, 14)

Another excavation unit (45) was opened to the north of square 44, under the supervision of Vashti Smith and Elizabeth Pace. As with the adjacent square, the objective for this square was to further open up the space tentatively identified as an atrium or courtyard space leading to the basilica's western entrance. The first two soil layers encountered (001, 002) in the stratigraphy of the squares maintained the pattern observed in this area, which comprised a wide span of pottery washed down with the natural erosion of the *tall* above. It was composed of a soil matrix from sandy gravel mix to cobble-sized limestone fragments, with some vegetal debris. The third soil strata (004), comprising the destruction layer of the church, was encountered about 1m from the surface. The location of the excavation unit directly west of the narthex space featured a colonnade. Column fragments were discovered in Square 43 including an ornate Ionic capital with fluting

and floral-pattern decoration. Basalt drums were also uncovered, including one protruding from the northern balk with an architectural mark on the inside end in the form of a Greek letter *tau*, or "T". A large architectural fragment, possibly of a corner section of the colonnade's architrave, was also found lying on the plastered surface of the floor. It appears that this surface was missing the tessellated mosaic floor that was encountered in the narthex space directly to the east.

Squares 41, 42, and 43 Balk Removal and Clearance (Fig. 15)

An important objective of this season was to complete the removal of the remaining balks from Squares 41, 42, and 43, which were excavated in the 2016 season, to better understand the nature of the western access to the church. Along with balk removal, the western halves (2×4m) of the squares needed to be excavated to the floor. These unexcavated



11. Square 44.



13. Square 45.



12. Square 44.



14. Square 45.

sections belonged to the destruction layer of the ecclesiastical complex, the earliest occupational level encountered in Area G. These remaining unexcavated sections (43x, 42x, 41x) were exposed to weathering and accumulation of debris during the off-season, so the approach to their removal was the same strategy as for the balks. This work was completed under the supervision of Josh Kruntorad, Maroun El Houkayem, and Scott Turnbull. This project began with the removal of Square 43's eastern balk, revealing the presence of a column drum and capital that appear to belong to the colonnade in the church narthex. This balk was located in the northernmost Square 43 and continued to the south. Unlike Square 43, the eastern balks of Squares 41 and 42 were dominated by a wall that appeared to belong to the church. It was decided that this provided better access by workers and tools for the subsequent removal of the southern balk of Square 43 and to access Squares 42 and 41.

In the course of excavation that followed, the eastern and southern balks of Squares 43 and 42 were removed. In Square 43, a mosaic floor of red and blue geometric patterns was uncovered with the removal of the east balk and the previously unexcavated section in the western half. The removal of the east balk in Square 42 further exposed the rear (west) wall of the diaconicon. Further excavation revealed a lower course of the wall of fine-cut ashlar in a header-stretcher pattern consistent with those the earlier structures that were added to the main church structure. An area of mosaic flooring existed in the eastern and western parts of Square 43 that appeared to end at a threshold featuring an embedded column base. The tessellated flooring evidently continued to the south into another space (Square 42) but is preserved in only a small section south of the threshold. This flooring had almost completely disappeared in the space between the threshold and the east-west wall revealed with the removal of Square 42 south balk.

The removal of the south balk and the unexcavated western portion of Square 42 uncovered secondary walls, but the floor was not reached this season. The east-west wall encountered with removal of the Square 42 south balk had an area of tumble at its center, which

was removed to uncover a basalt threshold for an inward-swinging door. This also appears to belong to the original church complex, though the function of the space remains unclear. Excavators noted tesserae discovered at the floor level, which may indicate the presence of a mosaic floor, although this will remain unclear until further excavation of Square 41 (**Fig. 16**).

Preliminary Interpretations

The principal aim of this excavation season was to increase our understanding of the western access to the church in Area G. The squares opened this season (44 and 45) served to extend the north-south exploration of the atrium space that includes large column bases on a decorative mosaic floor. As excavation progressed, it became clearer that the destruction caused by the earthquake was quite significant, leaving gaps in the material remains, and was certainly exacerbated by the subsequent reuse of the structure, which creates a somewhat confused picture of secondary construction. In the recent excavations of Squares 44 and 45, it appears that much of the tessellated flooring was either destroyed or removed from the atrium space,



15. Squares 41, 42, and 43 balk removal and clearance.

leaving just a plaster subflooring. The presence of ornate capitals, including an ionic capital decorated with fluting and floral patterns, may provide some indication of the church's rather significant resources. In the space southwest of the main entrance, which was further uncovered with the balk removal and clearance of Squares 42 and 43, a familiar pattern of reconstruction was evidenced with the reuse of architectural material to create various domestic spaces, as did the pattern in the rooms directly south of the church's main sanctuary. The room entrance encountered in Square 41 may prove to be more connected to the original ecclesiastical structure and function, but this remains to be seen.

Recommendations for Future Excavation

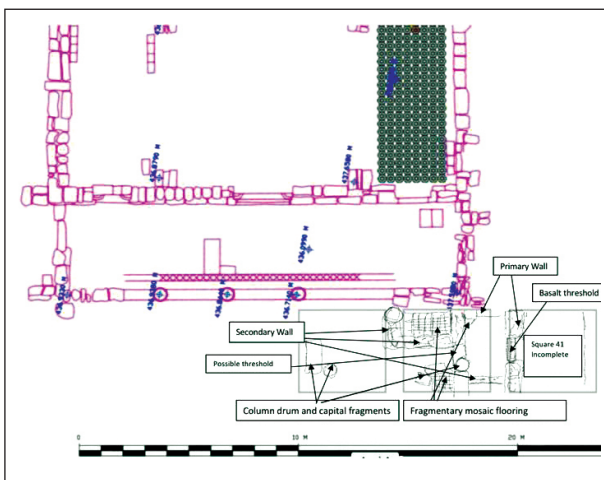
Several objectives for the 2020 excavation season should include the continued clearance of the western entrance to the church to determine the nature of its relationship to the ecclesiastical structure directly to the west. Another excavation unit should be planned (46) immediately to the north of Square 45, in order to determine if there is any pathway or structure that connects the northwest end of the narthex to the complex to the west. A main goal for the season should be to uncover the overall atrium area, as it has been excavated to this point, in order gain a better understanding of the function of this space and to consider the reconstruction of the colonnade that creates a dramatic entrance to the church. As with previous seasons, due to time constraints one square (44) was left with an unexcavated section (2×4m) in the western half that will need to be removed in the next

season's work. As part of this clearance process, work should continue to the floor of Squares 41 and 42 and remove the soil covering the mosaic floors extending throughout this area. Finally, a square should be considered in the northeast of the church, outside the north aisle, near the entrance of the water tunnel, to determine if there was direct access here from the church itself. It would be advisable to rent a bulldozer to clear the accumulated fill and construction debris that has accumulated over a number of excavation seasons.

Area E (Fig. 17)

In Area E, excavations were conducted as proposed in the dig design, with excavation units on the north side of the area following the mosaic paved processional passage exposed in 2014 and partially excavated in 2016. This area was supervised by Dr. Robert Smith, with Assistant Area Supervisor Daniel McCarley. Square Supervisors for this area were Marissa Johns, Eathan Devine, Andrew Bohlender, Keegan Case, Anyelca Dubon, Lexie Graft, Jane Mulkey, and Ana Rodriguez. The squares excavated this season lie at latitude 32.68201 and longitude 35.87013. These excavations have revealed information that points to the worship activities of pilgrims in the complex that involved the use of a significant amount of water. The excavations also exposed the frequent adjustment of the structures.

In the northeast section of the area excavated during our 2016 season, a large wall that joined with what appears to be an apse structure was encountered. Work this season focused on the west side of this wall. Our hope was to find a baptistry in this area, but excavations were inconclusive due to the extensive reuse of the area in later periods. Work in the excavation units inside this structure did not succeed in exposing all the architecture. The doorway (005) has a threshold that steps from the mosaic-covered processional passage in Square E98 down into a long stone-paved room that is *ca.* 3m wide and 7m. long (Fig. 18). The excavator was surprised that the interior of the building was not furnished with a more ornate floor. Cracks between the stones suggest that there is a water channel below. At the east end of the room, the walls evidence modifications.



16. Squares 41.



17. Area E.



18. A long stone-paved room in Square E98.

The most significant is the closure of a door to the east. The plaster surface (010) on that wall was found to contain a black painted inscription on the surface that contained at least three lines and, when interpreted, may give further understanding of the installation. At the northeast corner of the room, a narrow passage extends towards the apse to the north. At the threshold a carefully sealed ceramic pipe descends the wall. Its purpose remains to be seen. Such a pipe could have carried water from the terrace wall to serve a fountain.

In addition, the northwest corner of the atrium was cleared and exposed down to a well-preserved mosaic floor that continues from squares excavation in 2016.

Excavation in the future should focus on the area encompassed by the area west of the mosaic paved walkway and should expose the area within the apse found during the 2016 excavation season.

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THE PETRA HINTERLAND TOMBS PROJECT (PHTP): PRELIMINARY REPORT ON THE 2012 SEASON

Lucy Wadeson, Fawzi Abudanah and Lindsay Holman

Acknowledgements

The first field season of the Petra Hinterland Tombs Project (PHTP) took place between November 5th and November 15th, 2012. The project was directed by both Dr. Fawzi Abudanah and Dr. Lucy Wadeson and was supported by al-Hussein Bin Talal University and the University of Oxford. Lindsay Holman (University of North Carolina at Chapel Hill) was responsible for the preliminary study of the pottery collected during the survey. We would like to thank the former Director General of the Department of Antiquities of the Hashemite Kingdom of Jordan, Faris al-Hmood, for granting the survey permit and the Department of Antiquities representative, Riyadh al-Majali. We are also very grateful to the American Center of Oriental Research (ACOR) – in particular Christopher Tuttle and Elena Ronza – for providing accommodation and equipment, and to the following individuals for their assistance with the project: Ahmad Hasanat, Youssef Nasarat, Abu Emjed, Abu Rama, Abu Elias and his brother Mohammad Nuimat.

Introduction

During his previous surveys in the areas to the north-east, east and south-east of Petra (*e.g.* Abudanah 2004: 51-69; 2006), F. Abudanah noted several ancient tombs which he believed belonged to the late Nabataean – early Roman period (1st-2nd centuries AD) according to the architecture and associated pottery sherds. These tombs, which had not been recorded or studied before, had been recently robbed and faced the threat of ongoing illegal excavation

and looting. For this reason, the Petra Hinterland Tombs Project (PHTP) was set up for their urgent documentation and study, with the following specific aims:

- To record crucial data before the tombs are further disturbed or robbed and to subsequently assess whether any conservation is required for their future preservation;
- To establish the date of the tombs through a typological study and analysis of the ceramics;
- To determine the relationship between the tombs inside Petra and those in its hinterland through exploring factors such as urban versus rural settings, socio-economic status and tomb type, and the effect of the natural environment on funerary architecture and practices¹;
- To enhance knowledge of ancient funerary architecture and burial customs in the south of Jordan;
- To shed light on life and society in Petra's hinterland during the Nabataean and Roman periods.

The potential importance of these tombs was suggested by the discovery and subsequent excavation of the isolated, monumental tomb at KHirbat Sabūr (near At Tayyibah) by Abudanah in collaboration with the Department of Antiquities in 2007 (Abudanah *et al.* 2011: 1-10). This underground, vaulted tomb, located in the centre of an enclosure and linked to an

1. The study of these tombs provides valuable comparative material for understanding the tombs inside Petra that have been the focus of much scholarship (for example, see Wadeson 2012: 99-125; 2013: 18-24).

ancient road by a monumental approach, was intended for the burial of one individual – clearly one of significant importance given the monumentality and prominent location. The excavators believe this tomb should most likely be dated to the Nabataean period and proposed that the enclosure demarcated the sanctity of the space which was dedicated to activities related to ancestor worship (Abudanah *et al.* 2011: 7-8). Its unique layout and structure, but obvious links to Nabataean funerary customs, such as demarcating sacred space and providing a monumental approach (Wadeson 2011: 5-8), provides us with a wealth of new information on funerary traditions in rural areas of the Nabataean kingdom (or the later Provincia Arabia, depending on the dating).

Methodology and Fieldwork Strategy

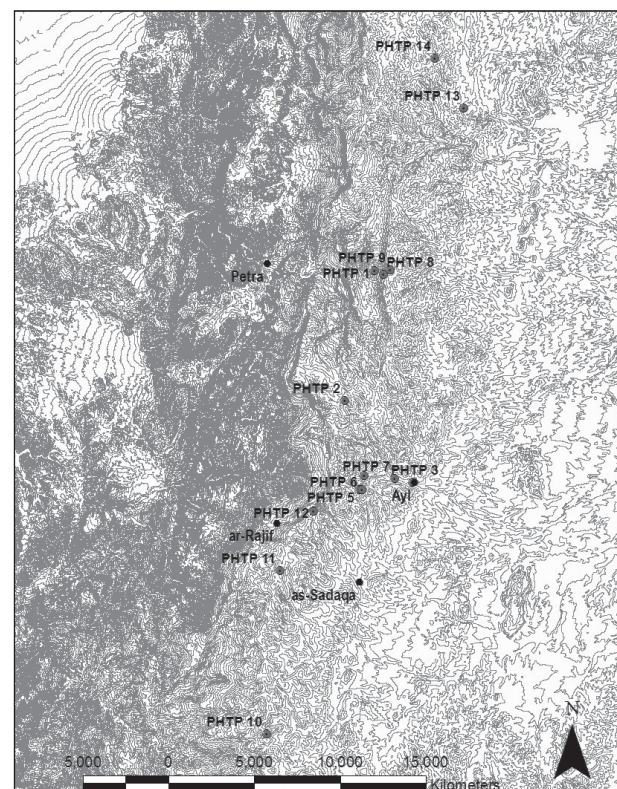
The first fieldwork season of the project, which took place over eleven days in November 2012, involved locating and recording the tombs previously seen by Abudanah and seeking potential new tombs through the aid of Google Earth and local knowledge. It ought to be noted that, ironically, it was the modern disturbance and looting of the tombs that in fact made them more visible in the landscape and thus brought them to our attention. During the eleven days, we managed to locate and record eleven previously unstudied ancient tombs in the area between Ash SHawbak in the north, Petra in the east and Rās An Naqab in the south, along the Jibāl Ash Sharāh ridge (**Fig. 1**). A further three ‘possible’ tombs were recorded, the situation of which was unclear due to them being less disturbed than the other structures.

The study area belongs to the Jibāl Ash Sharāh range. It comprises contiguous rocky hills, often intersected by small valley systems and occasionally by great ravines extending north-south. On the hilltops the elevation ranges from 1500 to 1700 metres above sea level. However, it gradually decreases from west to east.

With the aid of carefully designed documentation sheets, we catalogued each tomb according to a new numbering system (*e.g.* PHTP Tomb 1, PHTP Tomb 2 *etc.*) and recorded the following information: the location and surroundings of the tomb (including details of the landscape, orientation, related structures

and features, such as roads, settlements *etc.*), the UTM coordinates through use of a hand-held GPS (Garmin *etrex* with an accuracy of 3-4m) and the measurements (where possible) of the burial chamber and any visible monument above-ground. We also documented the tombs thoroughly by making sketch-plans, drawings and photographs. We collected visible pottery sherds that were either inside the tomb or in its immediate surroundings (though not exhaustively), which have undergone a preliminary study by ceramicist Lindsay Holman. Furthermore, the coordinates of all tomb sites were cross-checked against sites recorded in previous intensive surveys of this area (for *e.g.* Tholbecq 2001: 399-405; 2013: 295-312; MacDonald *et al.* 2011; 2012). Only one tomb (PHTP Tomb 13) was within an area previously recorded by MacDonald as a cemetery (Site 245, Al Qulayb Al GHarbī) (MacDonald *et al.* 2011: 369, table 2).

In some cases, sites which we initially expected to be tombs, turned out to be other features, such as walls, houses or simple caves. We noted this information on our documentation sheets and took the GPS points of any structures that were



1. Map showing location of tombs documented by the PHTP (F. Abudanah).

particularly significant (again cross-checking with sites previously surveyed by Tholbecq and MacDonald). It must be noted that the survey of the areas was not exhaustive – instead we only visited each site that was potentially a tomb, as observed either through Google Earth, or communicated by local inhabitants in the areas. For comparative purposes we also visited previously published Nabataean-Roman tombs at Aṣ Sadaqah (Kurdi 1972: 85-87) and Sabūr (Abudanah *et al.* 2011: 1-10), a Nabataean cemetery (JSS 80) recorded to the east of ‘Ayn Mūsā (Tholbecq 2001: 399-405) and a recently robbed cemetery at Al Qaranah in the Rās An Naqab area (Musil 1908: 229-230; Glueck 1935: 62; Kennedy 2004: 188-190).

List of Tombs Recorded

The tombs recorded in our survey are listed in **Table 1**, which includes the following information: their assigned number, location, UTM coordinates, elevation, tomb type and indication whether a surface structure was visible. As previously mentioned, all the tombs had been disturbed and robbed to varying degrees, meaning that the floors of accessible chambers were often blocked with rubble and large stones (potentially blocking lower levels of burials). Nevertheless, human remains and

ceramics were still visible in many cases. A brief description of each tomb is provided below, together with a short summary of results from the preliminary study of the ceramics [The ceramics report was prepared by Lindsay Holman]. A discussion then follows on the typology of the tombs, their general characteristics, and possible date.

PHTP Tomb 1

UTM coordinates: 0741121/3357327

Elevation: 1447m

Tomb 1 is located approximately 1.5km east of ‘Ayn Mūsā, on top of a ridge enclosed by valleys that has a clear view towards the mountains of Petra. An ancient wall running east-west is clearly visible just to the south of the tomb (**Fig. 2**). There is no visible settlement associated with this tomb, but agricultural fields exist in the vicinity and a cave is situated at a higher point on the ridge to the east. This tomb may be the same tomb (JSS 159) visited by Laurent Tholbecq and Hani Falahat during Tholbecq’s survey of the Jibāl Ash SHarāh (2001: 404, fig. 7), according to the published photo. However, the location of the tombs does not correspond exactly and since the tomb has not been properly documented before, it is difficult to verify.

Table 1: Tombs recorded in PHTP Season 1.

Tomb No.	Location	UTM Coordinates	Elevation	Tomb Type	Visible Surface Structure
PHTP 1	East of ‘Ayn Mūsā	0741121; 3357327	1447 m	<i>Hypogeum</i> with built <i>loculi</i>	Yes
PHTP 2	East of At Tayyibah	0739395; 3349737	1711 m	<i>Hypogeum</i> with built <i>loculi</i>	Yes
PHTP 3	KHirbat Ayl	0743340; 3344981	1462 m	Rock-cut (subterranean) with cist graves	No
PHTP 4	West of Ayl	0740514; 3345365	1544 m	Rock-cut (subterranean) with <i>dromos</i>	No
PHTP 5	West of Ayl	0740239; 3344536	1631 m	Rock-cut with carved <i>loculi</i>	No
PHTP 6	West of Ayl	0740391; 3344568	1639 m	Unknown	Yes
PHTP 7	West of Ayl	0742303; 3345191	1497 m	Rock-cut with carved <i>loculi</i>	No
PHTP 8	East of ‘Ayn Mūsā	0741662; 3357125	1555 m	Rock-cut (subterranean)	No
PHTP 9	East of ‘Ayn Mūsā	0742047; 3357387	1575 m	Unknown	Yes
PHTP 10	Northwest of Rās An Naqab	0734832; 3330296	1691 m	<i>Hypogeum</i> with built <i>loculi</i>	Yes
PHTP 11	Southeast of Ar Rajīf	0735613; 3339813	1703 m	<i>Hypogeum</i> with carved and built <i>loculi</i>	Yes
PHTP 12	Northeast of Ar Rajīf	0737555; 3343300	1677 m	<i>Hypogeum</i> with built <i>loculi</i>	Yes
PHTP 13	Northwest of Al Manshiyyah	0746344; 3366816	1436 m	Rock-cut with built entrance	No
PHTP 14	Southeast of Bīr Ikhdād	0744639; 3369732	1576 m	Unknown	Yes

The tomb consists of an underground chamber constructed of irregularly sized limestone ashlars. The chamber is almost square (2.57×2.42m) and originally had a vaulted ceiling as demonstrated by the remains of springers of two arches spanning the north and south walls (Fig. 3). Twelve square-shaped (0.50×0.50m; depth: ca. 2.20m) *loculi* for burial are visible in the west wall of the chamber, arranged in three rows, while one larger, rectangular *loculus* is visible in the opposite east wall (Fig. 4). The *loculi* are constructed of limestone slabs with small stones filling the gaps. The floor of the chamber is blocked by rubble and large stones displaced when the tomb was looted, but it is possible to see that the original floor level is considerably lower, as the bottom row of *loculi* in the west wall is partly blocked and the south-east corner contains deep holes between the rubble. Much of the tomb's construction material is scattered on the surface as a result of its looting. The size of

some of the blocks suggests that they may have formed a surface structure or monumental marker for the tomb.

The pottery sherds collected from this tomb site were mostly found in the debris scattered on the surface, with a primary date range of between the late 1st through 3rd centuries AD. One body sherd of a possible Iron Age vessel was recovered. The fabric is much cruder than the typical Nabataean and Roman period coarse wares, with many organic voids and quartz inclusions. For the diagnostic Nabataean and Roman vessels, jugs and jars dominated the assemblage (Fig. 5). Among the Nabataean fine wares were two carinated bowls of the 1st century AD (Schmid 2000: figs. 44-56) and one *unguentarium* base. Coarse ware cooking vessels were also recovered, including one 2nd/3rd century AD cooking pot with a deeply grooved rim.



2. PHTP Tomb 1, with wall and view towards Petra in the background (L. Wadeson).



4. Loculus in east wall of PHTP Tomb 1 (L. Wadeson).



3. Loculi in west wall of PHTP Tomb 1 (L. Wadeson).



5. Diagnostic sherds from PHTP Tomb 1 (L. Wadeson).

PHTP Tomb 2

UTM coordinates: 0739395/3349737

Elevation: 1711m

Tomb 2 is situated approximately 2km east of Taybeh (south-east of Petra) on a flat but relatively high ridge that commands views in all directions. There is an irregular enclosure around the site of the tomb and an ancient settlement 350m to the east, along which runs an ancient road. The area is surrounded by agricultural fields. This tomb is similar to



6. View down into PHTP Tomb 2 (looters' hole) (L. Wadeson).



7. Loculi in west wall of PHTP Tomb 2 and surviving arch (L. Wadeson).

Tomb 1, in that it consists of a subterranean vaulted chamber with built walls and *loculi* (Figs. 6-7). However, the chamber is much smaller (2.5×1.5m) and the east and north walls are partly rock-cut and partly built, displaying an effective use of mixed construction. There are six visible *loculi* built in the west wall, and eight in the south wall, arranged in three rows. On average they are approximately 0.55m wide, 0.85m tall and 2.30m deep. The bottom rows of *loculi* are blocked by rubble and large stones displaced when the tomb was looted, and it is clear that the original chamber floor is much lower. The *loculi* are constructed from large slabs of limestone and the gaps between the slabs are sealed with small stones and mud.

The looters disturbed this tomb by cutting a hole down in the east end, right through the roofing system (Fig. 6). Thus, the west side of the roofing system remains intact and it is possible to observe layers of irregularly sized stones and earth supported by an arch that is still *in situ* (Fig. 8). The well built arch extends between the middle of the south and north walls. When viewed from within the chamber, a neat line of well-cut ashlar can be seen lying directly across the arch. This offers a valuable insight into the construction of the tomb.

On the surface, four walls constructed of large, irregular ashlar form a square structure (ca. 5×5m) above the tomb (Fig. 9). Three courses of the one-metre thick walls survive (best preserved on the west side with an external height of 0.75m) and the mound of scattered blocks suggests that they supported some type of funerary monument (Fig. 10).



8. Section of roofing of PHTP Tomb 2 (facing west) (L. Wadeson).

The area around Tomb 2 yielded pottery primarily of the late 1st century AD. None of the sherds recovered have production periods that begin later than the 1st century AD. Nearly half of the sherds recovered (24 of 49) belong to Nabataean fine ware fabrics, including one Nabataean painted fine ware sherd from Phase 3b (70/80-106AD) (Schmid 1996: 207, fig. 701). Among the Nabataean fine ware sherds there are seven carinated bowl fragments and one possible unguentarium neck. Of the twenty-five coarse ware sherds recovered, seventeen are unidentifiable body sherds. Three triangular rim cooking pots of the mid-1st to mid-2nd centuries AD (Gerber 1994: pl. 16: B, E; 2008: 336, fig. 22:1) and one rounded cooking pot base were found. The remaining diagnostic coarse ware sherds were jar forms of the 1st century AD. From the enclosure around Tomb 2, three coarse ware sherds were found. Two are 'strap' jar handles and the remaining sherd is



9. Remains of walls of surface structure, PHTP Tomb 2 (facing west) (L. Wadeson).



10. Scattered remains of surface structure of PHTP Tomb 2 (L. Wadeson).

an unidentifiable closed form body sherd. This material also dates to the 1st and 2nd centuries AD. The ceramics collected from the settlement associated with Tomb 2 are not as diagnostic as the sherds from the tomb, but are of a similar date (1st to 2nd centuries AD). Three Nabataean fine ware ring bases (two bowls and one jar) and one coarse ware ring bowl base were identified.

PHTP Tomb 3

UTM coordinates: 0743340/3344981

Elevation: 1462m

Tomb 3 is located at Khirbat Ayl and associated with the ancient settlement that lies under the modern village. It is accessed through an opening in a limestone threshing floor and appears to have been a large, natural cave that was modified to become a burial chamber (**Fig. 11**). Access to this tomb was difficult as the opening and the chamber were heavily blocked with debris and rubbish. Measurements were therefore impossible to take. Evidently the tomb was reused for various domestic and agricultural purposes over the centuries, and the walls have begun to be quarried, giving the chamber an irregular shape. A variety of unidentifiable features are carved in the floor and walls. However, three pit graves are visible in the back left corner, two of which have been re-cut and connected by channels to serve another function. Other dips in the blocked floor could signify further graves. It is of course possible that the cave/chamber served another function before being used as a tomb. No pottery was collected from this tomb.



11. Entrance to PHTP Tomb 3 (L. Wadeson).

PHTP Tomb 4

UTM coordinates: 0740514/3345365

Elevation: 1544m

Tomb 4 is located almost three kilometres to the west of Tomb 3, also in a flat limestone platform that was used as a threshing floor. The site is on a low ridge, bound by valleys to the north and south and surrounded by high hills. There is a small ancient settlement *ca.* 300m to the north-east and a spring approximately one kilometre to the north-west. Immediately to the south-east of the tomb are the remains of architectural structures, including a massive wall of three courses built near a natural cave.

The tomb has been cut down vertically into the limestone floor and is accessed from the north end by a *dromos* (l. 2.90m; w. 0.90m) with at least four carved steps (**Fig. 12**). The chamber is large and deep (l. 6m; w. 2.5m) with irregular, curved walls, suggesting that it may have originally been a natural cave (**Fig. 13**). There are no features carved in the walls, and the floor is blocked with debris. Despite the lack of evident burial installations, the size, location and form of the chamber suggests that it is a tomb. Furthermore, F. Abudanah had seen human remains in the chamber on a previous visit.

On the surface, a few metres to the south of the tomb opening, a rectangular receptacle (l. 0.60m; w. 0.16m; d. 0.13m) is carved in the limestone floor (**Fig. 12**). Since this is on the same orientation as the chamber of the tomb (SW–NE), we considered that it may have been a marker for the tomb's location. Otherwise, it may have held a funerary stele. There are two more such receptacles to the north-west of the tomb – perhaps suggesting that more (blocked) tombs lie in this area. This seems likely given that next to one of them are the beginnings of a blocked hole. In that case we would be dealing with a cemetery, rather than an isolated tomb. Carved cup-holes are also visible in the limestone platform in association with the tomb(s), indicating ritual activities aboveground.

Most of the pottery recovered from Tomb 4 came from the surface and surroundings. There was a notable concentration of Nabataean painted fine ware sherds around the architectural structures south-east of the tomb. Overall, the

material collected is primarily dated from the 1st through 4th centuries AD. However, five sherds are of a cruder fabric with many organic voids, and are thus thought to be produced during the Iron Age. These have been retained for further study. Eight Nabataean painted fine ware sherds were recovered, two of which are Phase 3c (Schmid 1996: 209, figs. 702-704) and the remaining six are Phase 3b. One sherd of a Nabataean fine ware carinated bowl was also recovered. Among the coarse wares, one fragment of a triangular rim cooking pot was identified. The latest dated sherd is of a cooking pot with a slight groove on the rim produced from the late 1st through 4th centuries AD (Fellmann Brogli 1996: 244, figs. 734-735; Erickson-Gini 2010: 115, fig. 2.65). Several jar and jug forms were also identified among the corpus, but are awaiting further analysis.



12. Entrance to PHTP Tomb 4 and receptacle to the south (L. Wadeson).



13. Rock-cut chamber of PHTP Tomb 4 (L. Wadeson).

PHTP Tomb 5

UTM coordinates: 0740239/3344536

Elevation: 1631m

Tomb 5, also to the west of Ayl, is a rock-cut tomb carved into the slope of a ridge, overlooking a valley (**Fig. 14**). There are ancient settlement sites and a spring nearby, a military site to the east (Abudanah 2006, Site No. 264) and ancient roads to the west and south-west. The entrance to the tomb is partly blocked by large fallen boulders, thus access is somewhat difficult. The tomb has a t-shaped plan, with three large *loculi* (l. 2.20-2.80m; w. 0.90m; h. 1.10-1.25m) opening from the sides of a small vestibule (l. 1.20m; w. 1.30m) (**Fig. 15**). The floor is blocked by rubble and looters have even cut into the chalky rock, destroying part of the floor and the western *loculus*. No human remains or potsherds were visible. The tomb was originally accessed by a door, as indicated by the recessed space for a lintel in the north-eastern corner of the entrance.



14. Semi-blocked entrance of PHTP Tomb 5 (L. Wadeson).



15. View into PHTP Tomb 5 towards loculus in back wall (L. Wadeson).

In a previous visit to this tomb, F. Abudanah noted a sketch of its plan on a nearby rock. However, we were unable to locate this again. It is possible that more tombs are carved along the same ridge, but are not visible due to fallen rocks and boulders. Cup-holes carved on a small platform to the north-east of the tomb suggest that it was an area for funerary activities.

PHTP Tomb (?) 6

UTM coordinates: 0740391/3344568

Elevation: 1639m

Approximately 130m to the east of Tomb 5, on a high, flat ridge, is a mound scattered with ashlar blocks. A looters hole is visible on the top of the mound, but it is blocked with stones (**Fig. 16**). Given the similarities in appearance to the surface structures of PHTP Tombs 1 and 2, it is possible that this structure is also a tomb that has not been as heavily disturbed inside. Only excavation would confirm this hypothesis. The structure also seems to be surrounded by a stone enclosure and has a commanding view of the area like the other tombs recorded. Only three sherds of pottery were recovered from the surrounding area – all of which are undiagnostic body sherds. The quality of the fabric suggests that they are most likely dated to the 1st through 3rd centuries AD.

PHTP Tomb 7

UTM coordinates: 0742303/3345191

Elevation: 1497m

This tomb is approximately two kilometres to the north-west of Ayl, and one kilometre to the north-west of PHTP Tomb 3. It is a rock-cut tomb in the side of a small ridge, prominently located just above the modern road which follows the line of Wādī Ayl. It appears to be a natural cave that has been modified for use as a tomb. In front of the entrance to the tomb is an open area, which perhaps functioned as a small courtyard (**Fig. 17**).

The entrance is 4.20 metres wide, but this size is due to extensive erosion. The chamber is large (l. 7m; w. 5.10m; h. 2.20m) and almost square but not particularly well-carved. There is one *loculus* carved in the left part of the back wall and two carved in the right wall (**Fig. 18**). The *loculi* were impossible to measure as they were blocked with sand and debris. The floor of

the chamber is also blocked, but there are many holes that have been dug by looters. We were informed by locals of Ayl that pit graves are indeed carved in the floor, hence the attempts made by the looters. The ceiling of the tomb is blackened from fire, indicating reuse of the chamber for habitation.



16. PHTP Tomb (?) 6 facing south-west (L. Wadeson).



17. Entrance to PHTP Tomb 7 (L. Wadeson).



18. Burial chamber of PHTP Tomb 7 – view towards back wall (L. Wadeson).

In terms of the ceramics, Tomb 7 yielded limited diagnostic sherds; yet, based on the forms of the diagnostic pieces and the fabric of the eight coarse ware body sherds collected, the material dates from the 1st through 3rd centuries AD. Two Nabataean fine ware sherds were collected, including one ring bowl base with rouletting along the interior of the ring. A coarse ware rounded rim jar was also identified.

PHTP Tomb 8

UTM coordinates: 0741662/3357125

Elevation: 1555 m

Tomb 8 is located on a ridge to the east of ‘Ayn Mūsā and *ca.* 600 metres to the east of PHTP Tomb 1. There is an ancient wall to the west of the tomb and a cave to the south-west. The ridge is flat and elongated and slopes down to the west, with a clear view towards Petra. The tomb is a shaft tomb, entered via a small hole in the bedrock (**Fig. 19**). Access was difficult (no measurements possible), but we could see that the tomb consisted of a short corridor leading to a small, circular chamber. Deposits of stones and earth are visible around the entrance, on the surface, as a result of the looting of the tomb. However, no large blocks are visible that might suggest a built structure above the tomb. A short distance to the north-west of the tomb, cup-holes are carved on rock platforms.

All the pottery collected from Tomb 8 came from outside the tomb. The material primarily consisted of jug forms. Two 1st century AD jug rims and two jug handles were recovered. One possible *unguentarium* neck was also identified. There was one flat jug base of an



19. Entrance to PHTP Tomb 8 (L. Wadeson).

unknown period recovered. One triangular rim cooking pot was recovered. One ring bowl base with rouletting on the interior of the ring was the only sherd of Nabataean fine ware collected from the area. All the material, except for the unidentifiable jug base, had production periods dated from the 1st through 3rd centuries AD.

PHTP Tomb (?) 9

UTM coordinates: 0742047/3357387

Elevation: 1575 m

Almost 500 metres to the north-east of PHTP Tomb 8, on a higher ridge, is a prominent mound with scattered ashlar and lines of walls. In the middle is a looters' hole that is blocked with well-cut ashlar (**Fig. 20**). Similar to the situation for PHTP Tomb 6, we suggest that this may also be an underground tomb topped with a monument, especially since the possible roofing system bears remarkable similarities to PHTP Tomb 2. However, only excavation could



20. PHTP Tomb (?) 9 (L. Wadeson).



21. General view towards PHTP Tomb 10 with wall on the left (facing south) (L. Wadeson).

confirm this. Other structures are visible in the vicinity, for example the walls to the south-east. The site yielded ceramic material of the 1st through 3rd centuries AD. One *tegula* was also recovered. Of the diagnostic pottery recovered there was one flattened rim cooking pot, as well as two coarse ware jugs and one wide-mouthed coarse jar.

PHTP Tomb 10

UTM coordinates: 0734832/3330296

Elevation: 1691m

Tomb 10 is located *ca.* 14km north-west of Rās An Naqab, by the modern road that runs between Petra and Al 'Aqabah. It is situated on a slope that has a commanding view over the landscape to the south, where there are two ancient settlements. An ancient road is visible to the west of the tomb. Immediately to the south-west of the tomb is a rock outcrop, while a possibly ancient wall runs along the east side of the tomb towards the top of the slope in the north (**Fig. 21**).

The tomb is of the same form and construction as PHTP Tombs 1 and 2, consisting of a subterranean chamber with *loculi*. The chamber is almost square (2.60×2.55m) and the layout is symmetrical, with four *loculi* (two rows of two *loculi*) in each wall (**Fig. 22**). The average size of each *loculus* is 2.50 m in depth, 0.60m in width and 0.55m in height. The floor is blocked with looters' rubble, thus it is not clear if there are further rows of *loculi* or cist graves below. Some of the *loculi* are built with large ashlar and small stones filling the gaps, while others have walls that are only constructed with small



22. PHTP Tomb 10 with rock outcrop to the south-west (L. Wadeson).

stones. The *loculus* in the top left corner of the south wall exhibits both techniques in its walls. Large amounts of plaster remain on the chamber walls, particularly on the east wall (Fig. 23). In addition, human remains can still be found inside several of the *loculi*.

An arch springer is visible in the middle of the western wall, suggesting the roof was vaulted like the other examples. The roof itself seems to have been constructed of irregular stones and packed earth. Many blocks are scattered on the surface, perhaps from a superstructure. The few diagnostic sherds that were collected from Tomb 10 date from the 1st through 3rd centuries AD. One Nabataean painted fine ware Phase 3b sherd was identified. Also collected were one coarse ware storage jar handle, one coarse ware jar, and one coarse ware ring bowl base.

PHTP Tomb 11

UTM coordinates: 0735613/3339813

Elevation: 1703m

Tomb 11 is located almost 10 kilometres to the north of Tomb 10 and is south-east of the town of Ar Rajīf. It is situated on the high point of a flat ridge, directly to the east of an ancient road (running N-S) (Fig. 24). Further to the north (1.4km), along the same road, is an ancient settlement. Another ancient settlement lies just to the south (‘Ayn Jawāyizah east and west: Glueck 1935:72). The tomb has been constructed beside a rock outcrop, from where the building material was extracted.

This is another subterranean tomb with *loculi*, but it is larger than the previous examples. The chamber (4×3.30m) is blocked from the recent pillaging of the tomb, with much debris heaped up on the east side. The original floor is at a much deeper level than is visible. One row of *loculi* is visible, including three in the west wall, one in the south wall and two in the east wall, and it is likely that further rows exist below (Fig. 25). The construction technique of the chamber, like PHTP tombs 1, 2 and 10, is ashlar masonry, but notably the *loculi* are rock-cut at the back and built at the front. The *loculi* (h. 0.70-1.20m; w. 0.70-0.85m; d. 1.00-2.70m) in this tomb in fact present some other peculiarities. Firstly, the two *loculi* in the right part of the west wall appear to be unfinished since they are half as deep as the

others. Or it may be that they were used for the burial of children or served another purpose. Secondly, the *loculus* in the right part of the east wall, which is still half sealed at the bottom, has a small opening at the back in its right wall (Fig. 26). This opening leads to a small,



23. Remains of plaster on east wall of PHTP Tomb 10 (L. Wadeson).



24. PHTP Tomb 11 with ancient road in the distance (facing north) (L. Wadeson).



25. Loculi in west wall of PHTP Tomb 11 (L. Wadeson).

concealed side chamber (*ca.* 1.50×1.50m) that still contains human remains (**Fig. 27**). Apart from a built wall on the right side, the chamber is rock-cut. A similar arrangement may also exist in the south wall (**Fig. 25**). Although the *loculus* in the south wall is blocked with rubble and inaccessible, a similar opening is visible at the back of its left wall. This may explain why looters began to break the wall in the south-east corner of the chamber in order to reach these hidden rooms. It also explains why no *loculi* are carved in that part of the south wall. A large amount of human remains, including skull fragments, are visible in the *loculi*.

There are no *loculi* built in the north wall of the tomb, but there is an opening in the middle, which is now blocked with rubble (**Fig. 24**). We propose that this was the entrance to the chamber and probably contained a stairway leading down from the surface. The tomb is in fact oriented according to the cardinal points. Arch springers are still *in situ* in the south-



26. Loculi in east wall of PHTP Tomb 11 (L. Wadeson).



27. Entrance to concealed chamber inside loculus of PHTP Tomb 11 (L. Wadeson).

west and north-east corners of the chamber, indicating that arches spanned the east and west walls to support the roof. Massive stone blocks once covered this tomb and possibly formed a superstructure, according to the surviving sections of roofing and surface remains.

The pottery recovered from the area around Tomb 11 dates from the 1st through 3rd centuries AD. Among the 35 sherds collected, six are of Nabataean fine ware, including one carinated bowl rim and one jug rim. The remaining 29 coarse ware sherds include three jar handles, one ring jar base, one jug handle, and one folded rim jar all dating from the 1st through 3rd centuries AD. One neckless, everted rim cup with a vertical loop handle, which is manufactured between the 1st and 3rd centuries AD, was also recovered (Gerber 1994: pl. 16: Q; Schmid 2000: figs. 343-344; Negev and Siran 1977: 125, fig. 6.44).

PHTP Tomb 12

UTM coordinates: 0737555/3343300

Elevation: 1677m

Tomb 12 is situated north-east of Ar Rajīf and south-east of Petra, and is approximately four kilometres to the north-east of Tomb 11, to which it is connected by an ancient road. It takes a dominating position on a high ridge that has a direct view towards the mountains of Petra, in particular Jabal Hārūn to the north-west (**Fig. 28**). There are other structures in the surroundings of this tomb, such as a cave, walls and a rock platform with possible cup-holes.

The tomb consists of a square structure (6.45 × 6.45m) built with massive ashlars (**Fig. 28**).



28. PHTP Tomb 12 with Jabal Hārūn in the distance to the north-west (L. Wadeson).

The walls of the tomb are best preserved in the south-west and south-east corners. The inside of the tomb is heavily blocked with stones and rubble, thus it is difficult to determine the arrangement of the chamber. However, some sections of built *loculi* are visible on the west side beneath the rubble (**Fig. 29**). These are notably situated around ground level and not subterranean as the previous examples. Furthermore, if we reconstruct them to their typical depth, little space is left for the chamber itself, suggesting it was more like a corridor or shaft and thus different from the plan of the other *loculi* tombs we recorded. An outer wall or enclosure may have surrounded this tomb, as suggested by the line of ashlar just beyond the south-east corner.

Tomb 12 yielded sherds dated from the 1st through 3rd centuries AD. Among the diagnostic coarse ware sherds recovered there was one jar with a ribbed neck dating from the 1st to 3rd centuries AD (Gerber 2008: 336, fig.22.15), one



29: Built loculus inside PHTP Tomb 12 (L. Wadeson).



30. Looters' hole leading down to PHTP Tomb 13 (L. Wadeson).

jar with a folded rim, two jar ovular handles, and two jar ring bases. Two cooking pot forms were identified: one triangular rim cooking pot and one collared rim cooking pot produced from the mid-1st to the early 2nd century AD (Gerber 2008: 336, fig. 22:5). Among the Nabataean fine ware diagnostics identified, there were two carinated bowl rims and one hemispherical bowl (Schmid 2000: 9, fig. 60; Erickson-Gini 2010: 117:8).

PHTP Tomb 13

UTM coordinates: 0746344/3366816

Elevation: 1436 m

Tomb 13 is located north-west of the village of Al Manshiyyah, and south-west of the site known as Umm Kuwayz (MacDonald *et al.* 2011: 369, Table 2, Site 242), in the south slope of a small hill. Approximately 300 metres to the east of the hill is an ancient road and settlement. Several structures are visible on the summit of the hill, while at its base (to the south-west of the tomb) are massive scattered ashlar and two circular structures. This site seems to have been recorded by B. MacDonald during his survey in this area as Site 245/(Al Qulayb Al GHarbī), which is described as 'cemetery (?); enclosures; cistern (?)' (MacDonald *et al.* 2011: 369, table 2). However, we await a more detailed description in future publications to determine whether PHTP Tomb 13 was also noted.

The tomb we recorded is accessed via a looters' hole, which cuts through 2-metre deep layers of deposit in the slope of the hill (**Fig. 30**). It is a natural cave that has been modified with the addition of a built facade (w. 3.50m; d. 0.16m) and entrance (w. 0.75m) (**Fig. 31**). The chamber is heavily blocked with rubble and is



31. Built facade and entrance of PHTP Tomb 13 (L. Wadeson).

thus inaccessible. Despite the use of a torch at the entrance, we could not see the back wall of the chamber so we presume that it is relatively deep. The entrance to the tomb is only 0.90m high, bound by a built threshold and the top of the cave. Looters have dug holes in the built facade either side of the entrance. It is likely that more tombs exist in the slope of this hill, but are blocked by the deep deposits.

Pottery was abundant at this site (**Fig. 32**). Fourteen sherds of imported ware were recovered, but have been retained for further study. Of the pottery produced in Petra, the latest dated sherd is a cooking pot with a groove on the rim similar to the one found at PHTP Tomb 4. Six triangular rim cooking pots were also identified. One unidentifiable Nabataean painted fine ware sherd was recovered. The majority of the sherds recovered were coarse ware jar and jug forms. One Nabataean fine ware cup with a beaded rim was recovered (Erickson-Gini 2010: 119:25; Gerber 2008: 338, fig. 23: 21). The material identified has production periods dated from the 1st through 4th centuries AD.

PHTP Tomb (?) 14

UTM coordinates: 0744639/3369732

Elevation: 1576 m

Approximately 270 metres to the south-east of the village of Bīr Ikhdād is a large built square enclosure (32×32m). This lies 90 metres to the east of an ancient road and 1-2km to the north of two ancient settlements. This took our attention on Google Earth since there seemed to be a slightly off-centre structure with signs of disturbance. On the ground this turned out to be a mound with scattered ashlar and the beginnings of a robbers' hole in the centre, similar to the situation with the possible PHTP tombs 6 and 9 (**Fig. 33**). The presence of the well-cut ashlars, the enclosure and the position by an ancient road are factors that lead us to believe the structure may be a subterranean tomb. Remains of other structures are visible on the east side of the enclosure. Unfortunately due to extreme weather conditions at the time of our visit, we were unable to achieve a detailed documentation and study of this site and no ceramics were collected.



32. Diagnostic sherds from PHTP Tomb 13 (L. Wadeson).

Discussion

Typology

The tombs we recorded in the first field season of the PHTP primarily belong to two principal types. The first is the rock-cut tomb type, of which we have six examples. Rock-cut tombs are common throughout antiquity in this region, especially given the rocky and mountainous landscape that was available to exploit. In some cases natural caves were modified for use as tombs. Within this group we have two sub-types –tombs carved down into the bedrock, *i.e.* subterranean, (*e.g.* PHTP tombs 3, 4, 8) and tombs carved into the slope of a hill (*e.g.* PHTP tombs 5, 7, 13). The chambers of these tombs vary in size, and the typical sort of burial installations include *loculi* and cist graves. Apart from the built facade on Tomb 13, the rock-cut tombs recorded by the PHTP are simple, with no surviving traces of decoration, unlike the decorative, monumental examples at Petra.

The second type of tomb we recorded is a monumental, subterranean *loculi* tomb. These tombs typically have a square chamber built with irregular ashlar, and rows of built *loculi* in the walls. They also usually have vaulted ceilings that supported some type of superstructure or monumental tomb marker. We recorded five tombs of this type (PHTP tombs 1, 2, 10, 11, 12). Tomb 12 is slightly different as it seems to have higher rows of *loculi* and a narrow central space, rather than a chamber. Tomb 11 also presents some peculiarities in that its *loculi* are both rock-cut and built and are attached to concealed chambers. We also recorded three other possible tombs that may

be of this type (PHTP tombs (?) 6, 9, 14) due to their location and surface remains. However, without excavation this cannot be confirmed.

The same type of tomb has already been discovered in our survey area, but has not received much attention. During building works in Wādī Mūsā in 1998, Tomb WM 25 (“An Naqlah” cemetery) was discovered and excavated by the Department of Antiquities, and consequently built over (‘Amr *et al.* 1998: 526; ‘Amr and al-Momani 2001: 268). It is located on the eastern edge of Wādī Mūsā, above the site of KHirbat An Nawafrah. The report has not yet been published, but from available photos and the unpublished report on the skeletal remains, kindly provided by Megan Perry (Perry, n.d.), it is clear that we are dealing with the exact same type of tomb. The photo shows that after clearance, cist graves were evident in the chamber floor, which may very well be the case for some of the PHTP tombs.

The other example in the area is the tomb at Aṣ Sadaqah, 26km south-east of Petra. This was also excavated by the Department of Antiquities (Kurdi 1972: 85-87) and presents identical characteristics to PHTP Tomb 12. For example, it has a square superstructure of *ca.* 6×6m built of massive ashlar, and built *loculi* that are close to the surface and take up most of the central space. The Aṣ Sadaqah tomb in fact had a vertical shaft providing entrance to the *loculi*, which allows us to understand the plan of Tomb 12 and why there was no central chamber like the other tombs.

Comparable, built *loculi* tombs are also known in other sites further afield, such as Jarash (Smadeh *et al.* 1992: 271), and Umm Al Jimāl (Cheyney *et al.* 2009). However, those examples have a much higher standard of construction and are more monumental, which is unsurprising given that they are located in urban centres.

General Characteristics

The PHTP tombs are all found in rural contexts, but tend to be located in prominent positions, such as by roads and on hill-tops, where they had a commanding view over the surrounding landscape and where they could also be seen from afar. When we observe their position on the map (see **Fig. 1**), it becomes clear that they



33. PHTP Tomb (?) 14 (L. Wadeson).

are situated roughly in a line along the top of the Sharāh ridge that extends north-south, to the east of the mountains of Petra. This location is significant as it is the highest point in the area and often has direct views towards Petra, as was noted especially for Tomb 1 and Tomb 12.

Apart from some of the rock-cut tombs (e.g. PHTP tombs 4, 5, 8, 13), which may belong to a necropolis, the remainder of the tombs we recorded are isolated. These tombs are often associated with a nearby small settlement – either a farmstead or hamlet. In some cases, they are situated by walls or within enclosures, such as tombs 1, 2 and 10. These factors suggest that the tombs may have also functioned as territorial markers of family-owned property. In particular, it ought to be remembered that the hypogea with *loculi* held multiple interments, and were thus likely intended for extended families or several generations of the same family.

The tombs with evidence for a superstructure would have been highly visible in the landscape. They served to display the status of the family buried in the tombs and the property owners. The idea of a monumental marker for a tomb, separate from the burial chamber, is common in Nabataean funerary architecture (Wadeson 2012: 107).

This concept is expressed in inscriptions (e.g. a Nabataean funerary inscription from Mādabā, CIS II 196; Healey 1993: 247-248), and well-known examples of such tombs include those at DHāt Rās and KHirbat Adh DHarīh (Zayadine 1970: 117-135; Lenoble *et al.* 2001: 85-191). The monumental part or *nephesh* (*npš*) of the tomb memorialised and commemorated the soul of the deceased (Wenning 2001: 87-88; Kühn 2005: 136-228), while the actual burial chamber held the physical remains.

It is at present unknown to what extent ritual activities took place around the site of the tombs we recorded. However, cup-holes were noted near several of the rock-cut tombs, such as tombs 4, 5 and 8. Clearance of the deposits around the surroundings of the tombs would shed light on this matter. In terms of the ceramics, jars and jugs represented the most common vessel form recovered at the sites. Cups were a rare form at the sites (with only two sherds identified among the diagnostics). The most frequently identified bowl form was the carinated bowl.

Date of the Tombs

Use of the ceramics in dating the tombs is of course limited at this stage of the project, given that all the sherds were unstratified and many were found outside the burial chambers in the looters' dumps. Nabataean coarse and fine wares dominated the assemblage, but this does not necessarily mean that the tombs are Nabataean. It does mean that there was activity at the site during the period in which Nabataean pottery was produced. According to the ceramics, the primary date range for all sites surveyed was the 1st through 3rd centuries AD, with only Tombs 1 and 4 possibly yielding earlier material. Tombs 4 and 13 also had a common cooking pot form that was produced from the late 1st through 4th centuries AD. Among the Nabataean painted fine ware, Phase 3b was the most frequent type recovered.

Nevertheless, the ceramics from the hypogea with built *loculi* were relatively consistent and Tomb 2 has a homogeneous corpus of 1st century AD material. A 1st century AD date for these tombs is likely because this was the date ascribed to the same types of tombs at Wādī Mūsā (WM 25, "An Naqlah"; 'Amr *et al.* 1998: 526; 'Amr and al-Momani 2001: 268) and Aṣ Sadaqah according to the excavated ceramics (Kurdi 1972: 87). Thus, these tombs coincide with the carving of the monumental Nabataean tombs inside Petra (Wadeson 2010: 48-69). The rock-cut tombs are more difficult to date, since this type of tomb is simple in design and common throughout antiquity. The presence of *loculi* does narrow the time frame down to the Greco-Roman period when we know they were in vogue. However, the PHTP rock-cut tombs without any characteristic burial structures, such as Tombs 4 and 8, could in fact have been carved in earlier periods and later reused. Future clearance and excavation of these tombs aims at establishing a more precise chronology for them.

Conclusions and Future Work

The first season of the PHTP has recorded previously unknown rock-cut and built tombs in the hinterland of Petra, particularly in the areas to the north-east, east and south-east of the city, along the Jibāl Ash SHarāh range. Among these tombs, a significant type has emerged which

consists of a monumental *hypogeum* with built *loculi* and possible superstructure, prominently positioned in the landscape. These tombs possibly date to the 1st century AD. Only two such tombs were previously noted in the area and have received little attention in scholarship. It may be that these tombs served as territorial markers in this rural landscape.

The tombs documented by the PHTP are a valuable source of information on life and society outside Petra during the Nabataean and Roman periods. Our results are at this stage preliminary, but through the analysis of our collected data and further field seasons, we hope to be able to date these tombs more securely, reconstruct their associated funerary practices, and establish their relationship to funerary architecture and customs in other parts of Jordan and neighbouring regions.

Our survey highlights the fact that these tombs need protection against further damage from robbers and illegal looting – especially the monumental built tombs which have suffered the most damage. In future seasons of the PHTP, we would like to clear and excavate several characteristic examples, such as Tombs 10 and 11, in order to preserve the human remains, seek further dating material and conserve the built architecture. The cleaning of these tombs would also make them excellent sites for tourists to visit on the voyage between Petra and Wādī Ramm/Al ‘Aqabah, providing them with a valuable insight into rural sites of this region in antiquity.

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