

SUMMARY RESULTS OF THE ARCHAEOLOGICAL PROJECT AT KHIRBAT AN-NAWĀFLA/ WĀDĪ MŪSĀ

by

Khairieh 'Amr, Ahmed al-Momani, Naif Al-Nawafleh and Sami Al-Nawafleh

Introduction

Khirbat an-Nawāfla (JADIS Site 1997.071) is a multi-period site extending over an area of around 50,000m² in the northwestern sector of the town of Wādī Mūsā, at *circa* Palestine Grid coordinates 196550-196800E; 970970-970950N and elevation 1200m asl in the south up to 1225m asl in the north (Fig. 1, see also 'Amr *et al.* 1998: 519-520, Site Wadi Musa 9). The site was settled by the an-Nawāfla tribe at around 1870, when oral tradition describes it as "a deserted barren area with many stone clusters (*rujūm*)". Members of the tribe made use of the abundant building stones in constructing their village, which they in turn abandoned in 1975 when they built modern cement houses further uphill from the village. They kept, however, their lush olive and fruit orchards on the terraces surrounding their traditional village. Biewers (1993: 5,17) states that the village was established in 1934. Local people as well as architects working at the site, however, estimate that the earliest traditional houses there date back to the end of the 19th or beginning of the 20th century.

The abandoned traditional village drew

private investment to the site, in the form of a 45 dunum tourist village. Due to the construction of the tourist project, the Department of Antiquities conducted a salvage project at the site from 1 April to 30 December 1997 (Fig. 2), followed by further investigations and architectural consolidation during June 1998, and from 4 August 1999 to 31 January 2000.¹

In 1997, a total of 72 squares and sections in seven areas were excavated. The 1998 season concentrated on an open cistern near the entrance to the village (Area VIII), while the 1999-2000 season dealt with specific investigations and consolidation work in two areas (Areas V and VIII).

Khirbat an-Nawāfla merges with Iron Age Ṭawilān (Bennett and Bienkowski 1995) to the north and the Pre-Pottery Neolithic village of al-Basīṭ (Fino 1997; 1998) to the west.

Summary of the Archaeological Finds

The earliest remains found at Khirbat an-Nawāfla date to the Iron II (Edomite) period—although there are scarce indications of the Early and Middle Bronze Age as well, namely an EBIV "Canaan blade" and a few

1. The 1997 season was directed by Khairieh 'Amr; co-director Ahmed al-Momani; excavators: Sami Al-Nawafleh, Rula Qussous, Hanan Azar, Lina Arabiyat, Nazeh Fino, Naif Al-Nawafleh, Manal Natour, Ibrahim Zaben, Ibrahim Masha'leh, Ibtihal Hanandeh, Sa'ed Tweissi, Nidal Masha'leh, Hasan Al-Luwama and Hani Falahat; draughts persons: Hala Suyuf, Sofinaz Kabaja, Saleh Al-Nawafleh, Talal Al-Nawafleh, Ahmed Harb Al-Nawafleh, Luay Mohamadieh and Hamed Al-Nawafleh; surveyors: Luay Mohamadieh and Zeid Haddadin; photographers: Osama Jaber, Mohammad Fayez,

Salem Da'jeh and Adel Haddad; conservator and small finds draughts person: Qais Tweissi; metal conservation: Ibrahim Haj Hassan and Adel Turshan; object registrars: Hanan Azar and Rula Qussous. In 1998 Sami Al-Nawafleh supervised the project, while the 1999-2000 season was supervised by Naif Al-Nawafleh. The architectural consolidation was done in coordination with Archs. Leen Fakhoury and Akram Omeish, and the GTZ Petra Stone Preservation Project, conservators included Qais Tweissi and Tawfiq Huneiti.



1. The location of Khirbat an-Nawāfla within the town of Wādī Mūsā (base map courtesy of PRPC).



2. Khirbat an-Nawāfla during the 1997 excavation season (view to the west, towards Petra).

pottery sherds that may date to the MBII, with no associated structures. These Iron II remains consist of pits as well as terrace and division walls found in the northeast (Excavation Area VI), which may be connected with adjoining Ṭawilān. In one limited location in the same area, a small Hellenistic period pit and associated surface was also found (Fig. 3). Additionally, at the present entrance to the village in the southwest edge of the site (Area VII), substantial walls covered by deposits containing large amounts of first century BC pottery may also date to the Iron Age, but this cannot be confirmed until the wall foundations are reached.

The main occupation at Khirbat an-Nawāfla started in the Nabataean period, during the first century BC. Occupation at the site continued—with only a few gaps—up to the present. This long occupational sequence has not yet been discovered at any other site in the area, and it may be due to the fact that the site was a simple agricultural village throughout, therefore it was less affected by the turmoils and upheavals that swept southern Jordan at various times during the past 21 centuries than the more prominent centres, such as neighbouring Petra.

The long occupational history of Khirbat

an-Nawāfla produced excellent stratification of the material culture, resulting in very deep deposits going up to over six metres in some locations. The continual reuse of the same site, however, also meant that there was much destruction of the earlier periods while the later Islamic periods remained relatively well preserved (Fig. 4).

The continuity of the way of life at an-Nawāfla is strikingly evident in the architecture. Since its establishment in the first century BC, structures were built of stone blocks with mud mortar and roofs supported by stone arches, while the steepness of the slope was overcome by the building of terraces (Fig. 5). These terraces preserved parts of the earlier structures and other than serving to level the ground for construction, they supported the agriculture. Currently, the terraces surrounding the village are planted with walnut, pomegranate, apricot and mulberry trees, with vegetables in between, but most of all there are the olive trees, which gave the whole area its other name “Ḥayy az-Zaytūna” (the district of the olive tree). Remains of five olive presses were excavated (Nabataean in Area I; Late Umayyad/Early Abbasid, Ayyubid/Mamluk and early 20th century in Area V; and very badly disturbed but probably Early Islamic in Area



3. Khirbat an-Nawāfla, Sq. VI.02: Hellenistic pit dug into an Edomite field wall (view to the south).



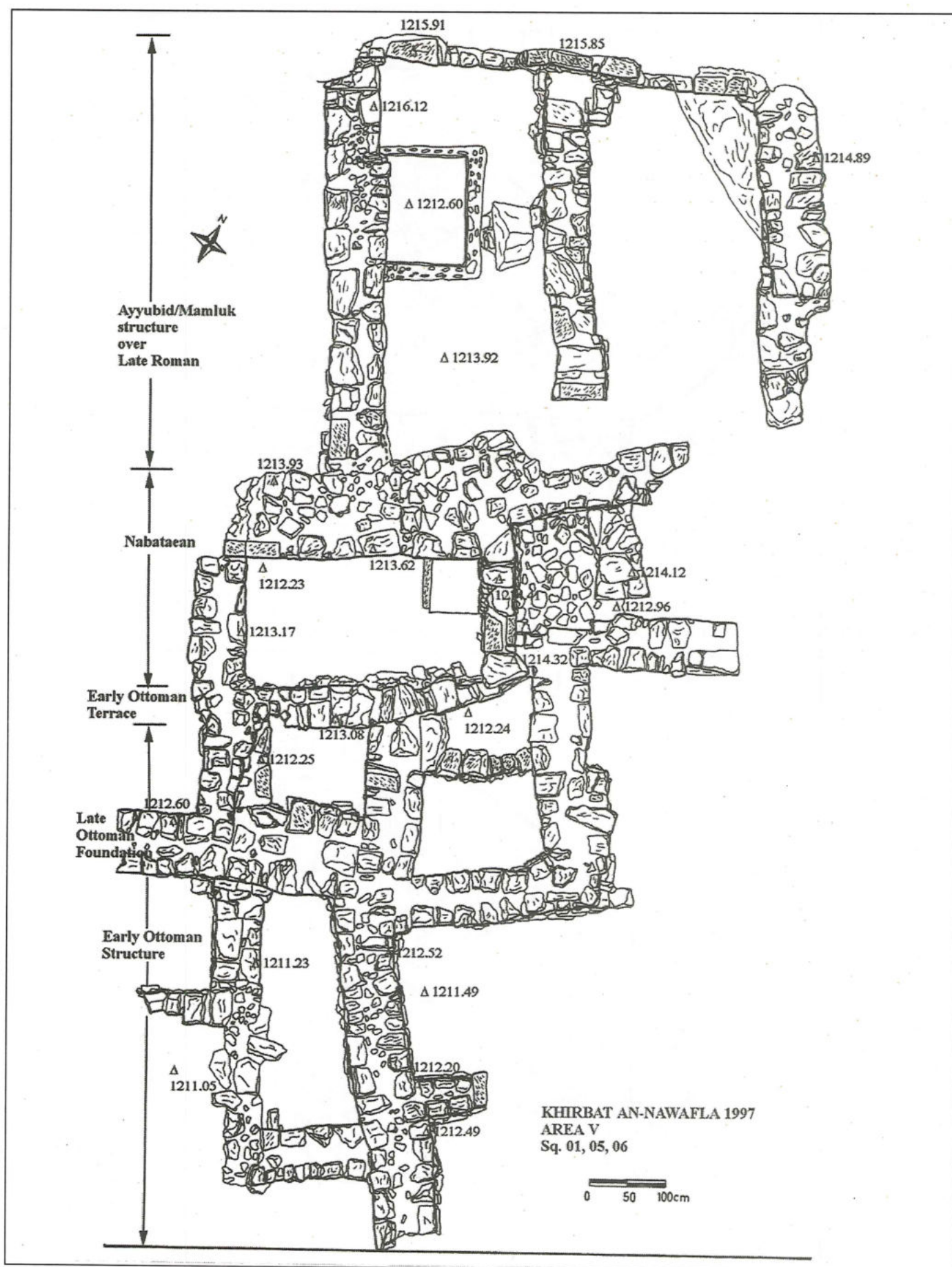
4. Khirbat an-Nawāfla, Sq. III.05: Nabataean water channel below a sequence of Byzantine, Early Islamic and Late Islamic structures.

II). The numerous olive press stones found scattered all over the village indicate that several more olive presses would have existed at the site, especially keeping in mind that it is highly probable that people built their presses where they had a supply of expensive, difficult-to-make-or-move olive press stones (Area V being a prime example of such a practice). The simple way of life at the village throughout the periods is further evidenced by the rarity of imported luxury goods.

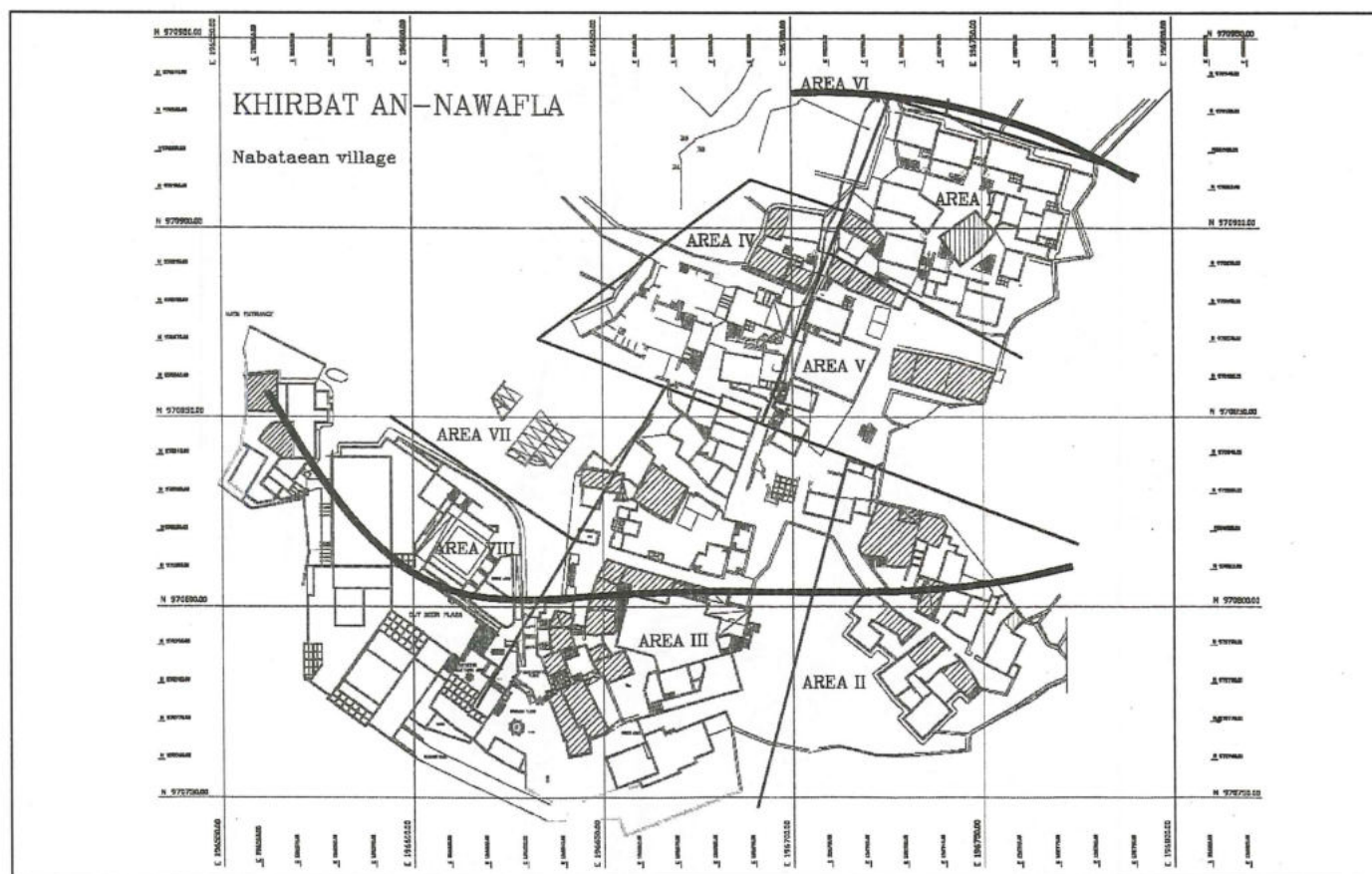
The Nabataean Period

The Nabataean village occupied most of the area of the modern village, except for part of the southern sector (Fig. 6a). From this period there are remains of hydraulic installations such as several channels and a water tank, other than the cistern at the entrance to the village which is Nabataean in origin (but modified at least during the Late Roman, Early Islamic, Ayyubid/Mamluk, Ottoman and modern periods). This cistern was the most distinctive feature of the site prior to the excavations, when it was used as a small garden to grow vegetables, next to several vines, a pomegranate and an apricot tree (Fig. 7a-b). It was decided not to disturb the trees and to limit excavation within the

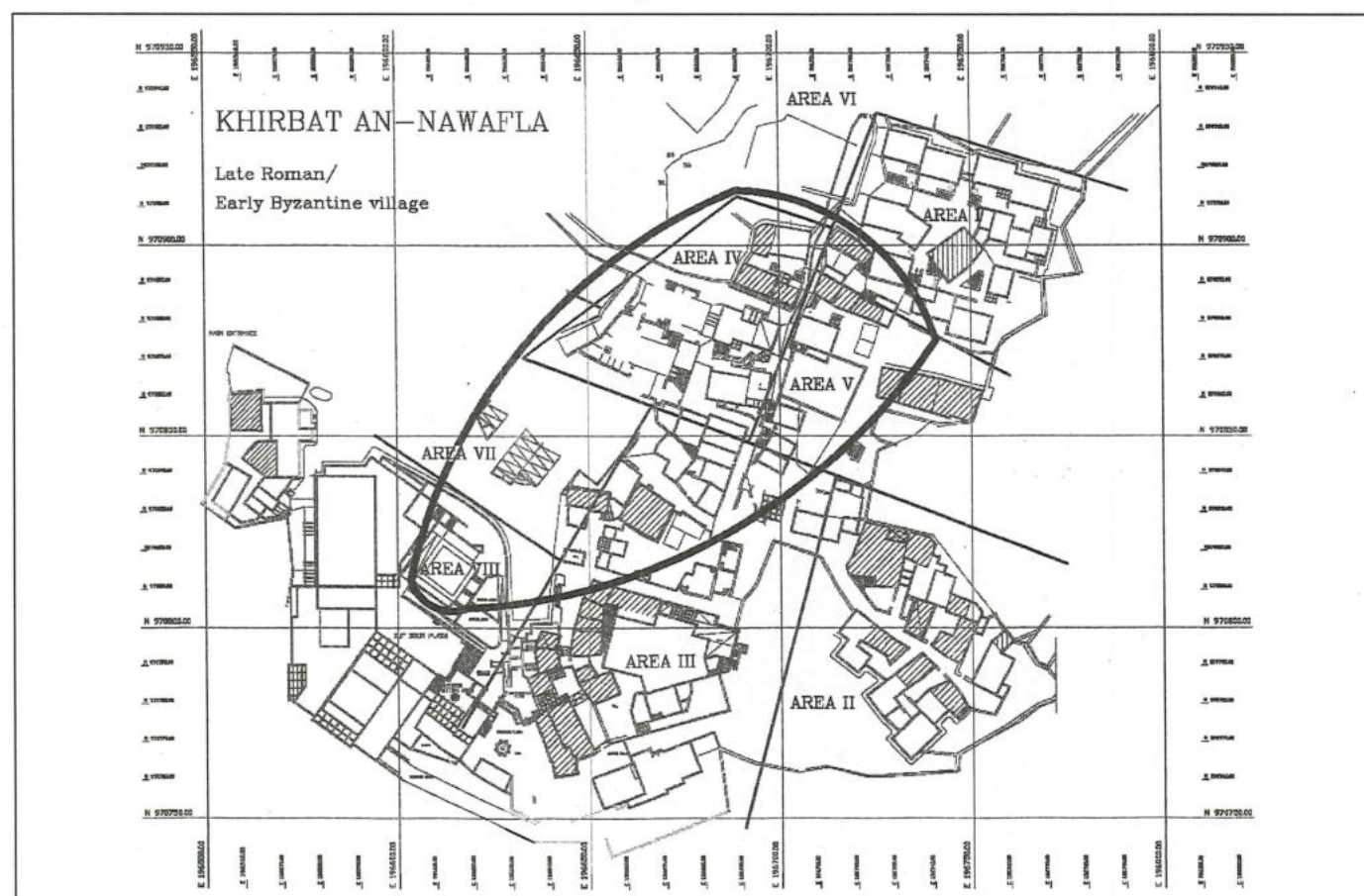
cistern to a minimum. The cistern is roughly square in plan, with external dimensions of around 15 x 15m and a capacity of over 530m³. The northern and eastern walls were cut into the mountain side, while the western and southern walls are free-standing with a width of 1.25-1.50m. The western wall has two phases of construction, as the present wall is constructed next to the exterior face of the original wall which was modified to serve as a staircase into the cistern from its southwestern corner. The similarity in construction and bonding of the walls indicates that the two phases are chronologically very close. The interior—which is lined with the same large hard limestone boulders as the exterior—was covered with hydraulic mortar, and the bottom paved with stone cobbles. The inlet had been disturbed prior to excavation but it was most probably at the northern side, where a paving of cobbles still exists. The outlet, at the western side, is quite impressive and features a round (11cm diameter) hole cut into a cylindrical stone inserted through a large hard limestone block, protected by two protruding walls (Fig. 7b). The exterior channel created by the walls starts at around 45cm width and opens up to 63cm at the preserved length of *circa* 125cm. This channel may have led to an-



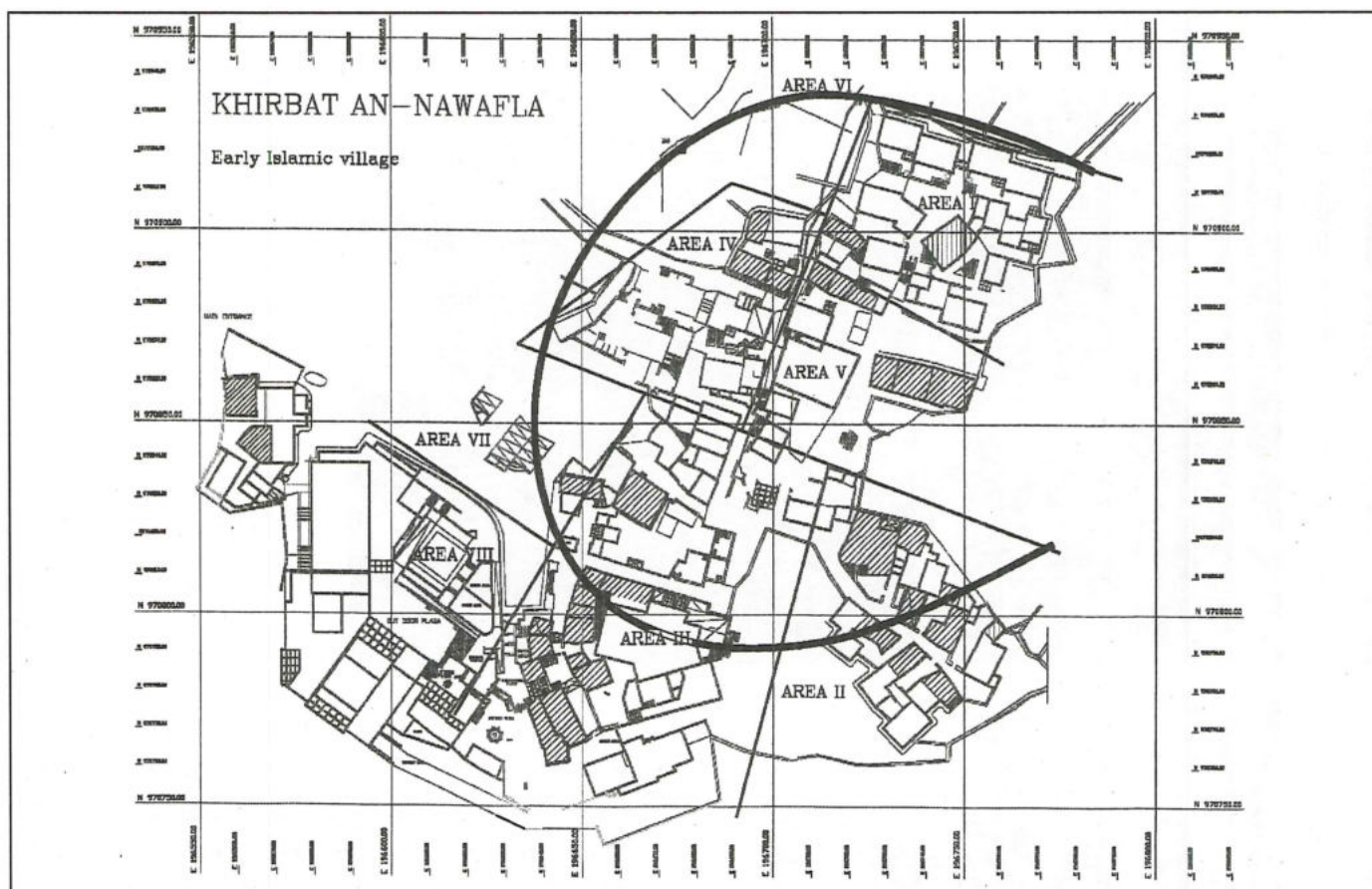
5. Khirbat an-Nawāfla, Sq. V.01, V.05 and V.06: top plan (drawing by Saleh Al-Nawafleh).



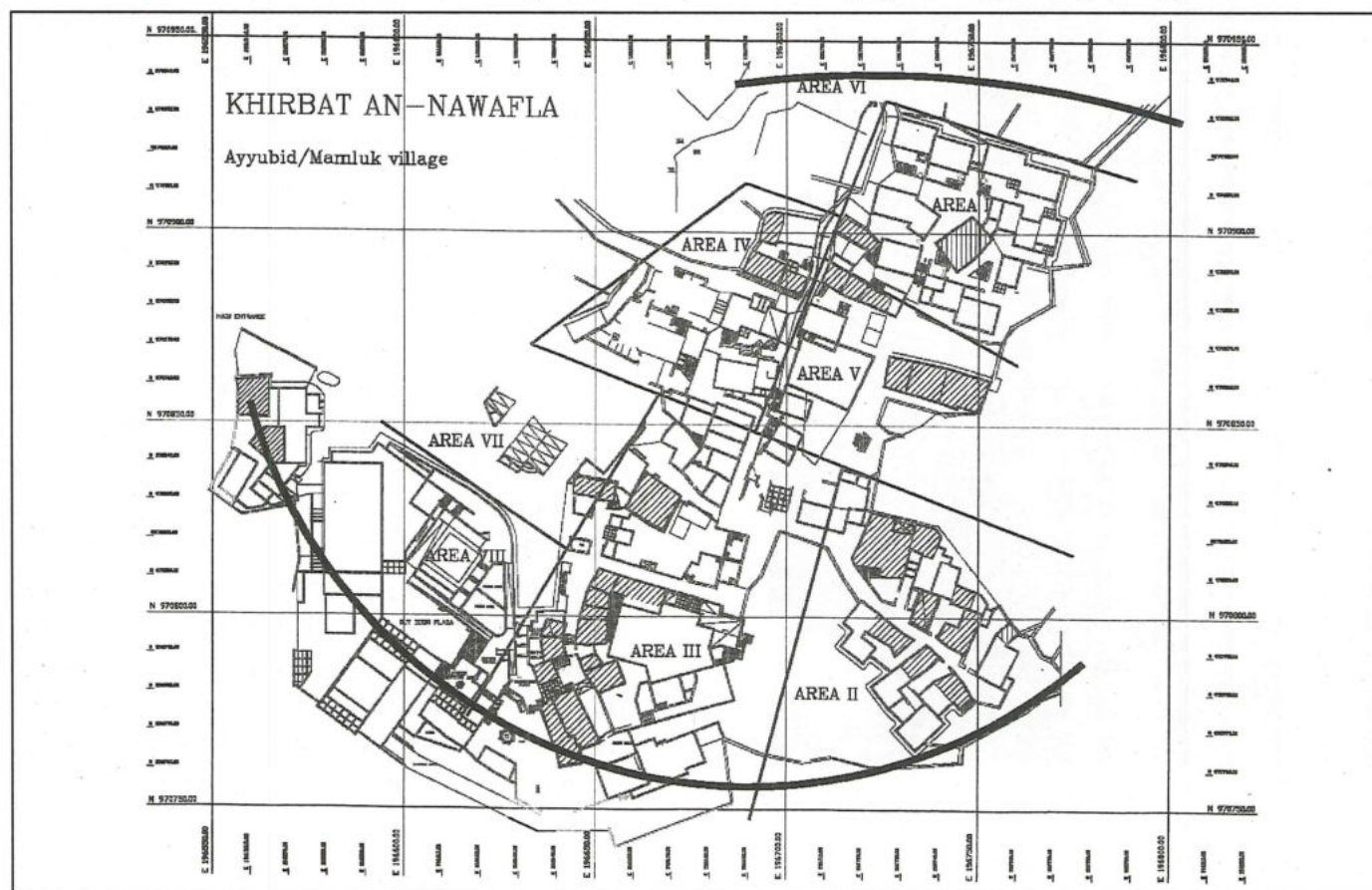
6a. Khirbat an-Nawāfla: Extent of the Nabataean village (base map courtesy of JTI).



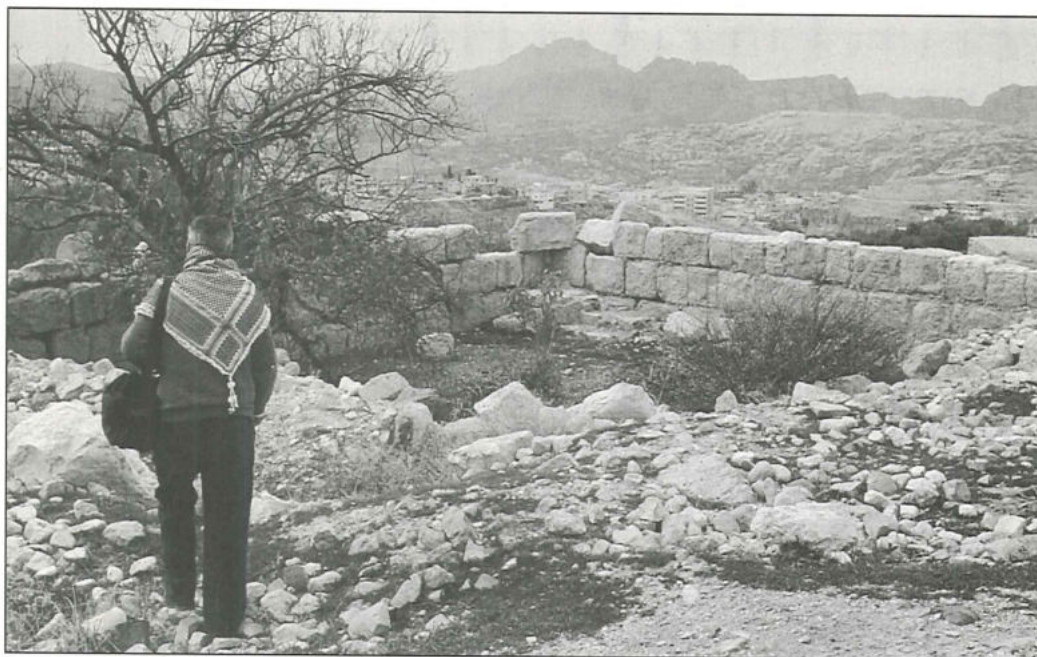
6b. Khirbat an-Nawāfla: Extent of the Late Roman/Early Byzantine village (base map courtesy of JTI).



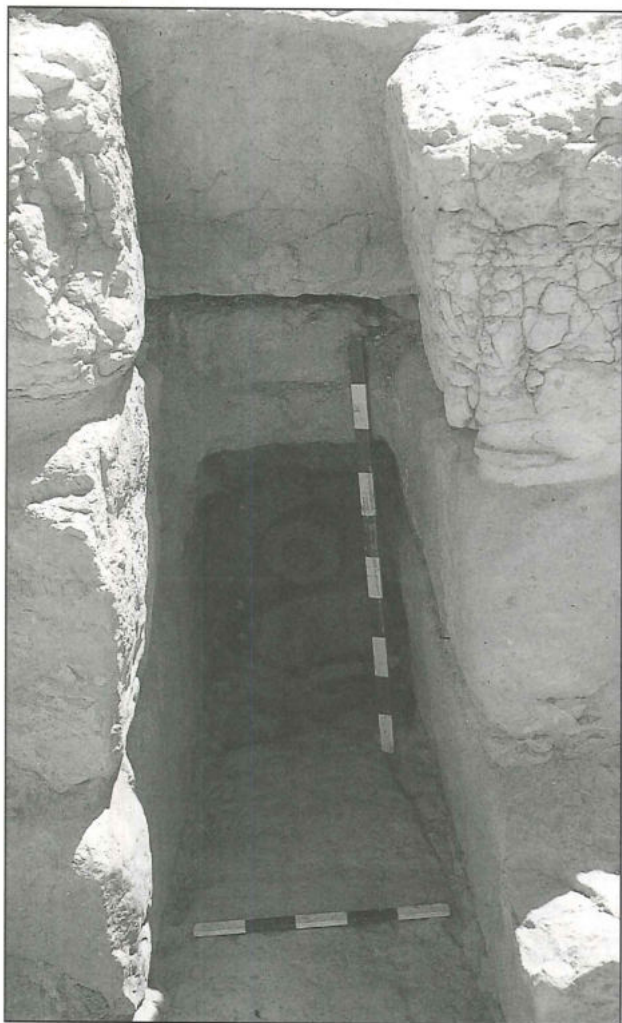
6c. Khirbat an-Nawāfla: Extent of the Late Byzantine/Early Islamic village (base map courtesy of JTI).



6d. Khirbat an-Nawāfla: Extent of the Ayyubid/Mamluk village (base map courtesy of JTI).



7a. Khirbat an-Nawāfla, Area VIII: The open cistern in March 1995 (view to the southwest).



7b. Khirbat an-Nawāfla, Area VIII: The open cistern after conservation, outlet in the western wall.

other cistern around 45m to the west, the presence of which is indicated by a substantial wall with hydraulic mortar, currently incorporated into the back wall of a traditional structure just outside the entrance to the tourist village. Still further west, excavation for a wastewater pipeline in 1999 revealed the presence of a 25cm diameter ceramic pipeline that may be connected with the Khirbat an-Nawāfla hydraulic system.²

Directly to the southeast of the village there are the foundations of a substantial Nabataean bridge crossing Wādī Khalīl/al-Madarr (Fig. 8), this being the only known remains of an ancient bridge within the town of Wādī Mūsā. The bridge may have lead to a temple, as a Nabataean inscription on a marble slab built into a traditional house at the southern edge of the village mentions an *ALAHAT*, a goddess, and several elaborate cornices that may have belonged to a temple were found scattered around the southeastern sector of the village. The existence of a Nabataean cemetery nearby is indicated by the discovery of two Nabataean tombstones, one bearing the name of the deceased.

2. This Nabataean ceramic channel was recorded during the work of the archaeological supervision of

the Wādī Mūsā Water System and Wastewater Project.



8. Khirbat an-Nawāfla: Foundations of the Nabataean bridge in Wādī Khalīl/al-Madarr.

The excavations revealed parts of several Nabataean houses and courtyards, including a small kitchen in Area V (Fig. 9; jug no. 6 was found inside the *ṭābūn* oven of the kitchen, obviously used for heating liquids). The relative affluence during this period is indicated by the fact that most of the excavated houses had flagstone pavements, and one room in the north (Area I) had hexagonal paving which is usually used for the more important structures during the Nabataean period.

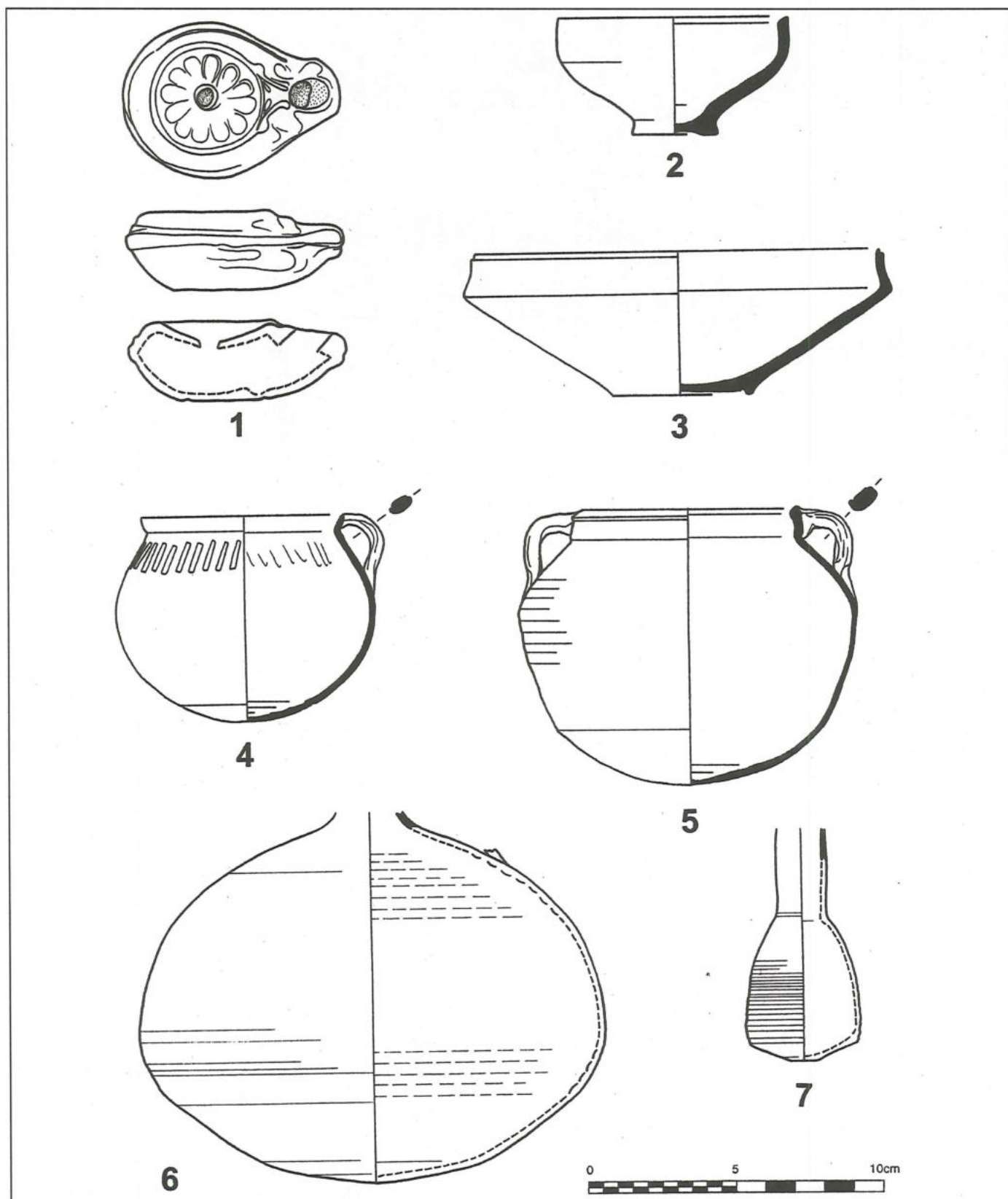
The most significant Nabataean discovery at the site was that of the—unfortunately much disturbed—remains of an olive press dating to the early first century AD in the northern part of the site (Area I, Figs. 10, 11:3, 5). This is the earliest known Nabataean olive press to date, as the only two other known olive presses at Khirbat adh-Dhariḥ to the north of aṭ-Ṭafila date to the late first/early second century AD (Villeneuve 1990). This discovery further negates Strabo, who claimed that the Nabataeans did not grow olives and only used sesame oil.

In direct relationship to the extent of the villages, the objects dating to the Nabataean period recovered from the excavations form the second largest group after the Medieval Islamic. Other than the two tombstones and

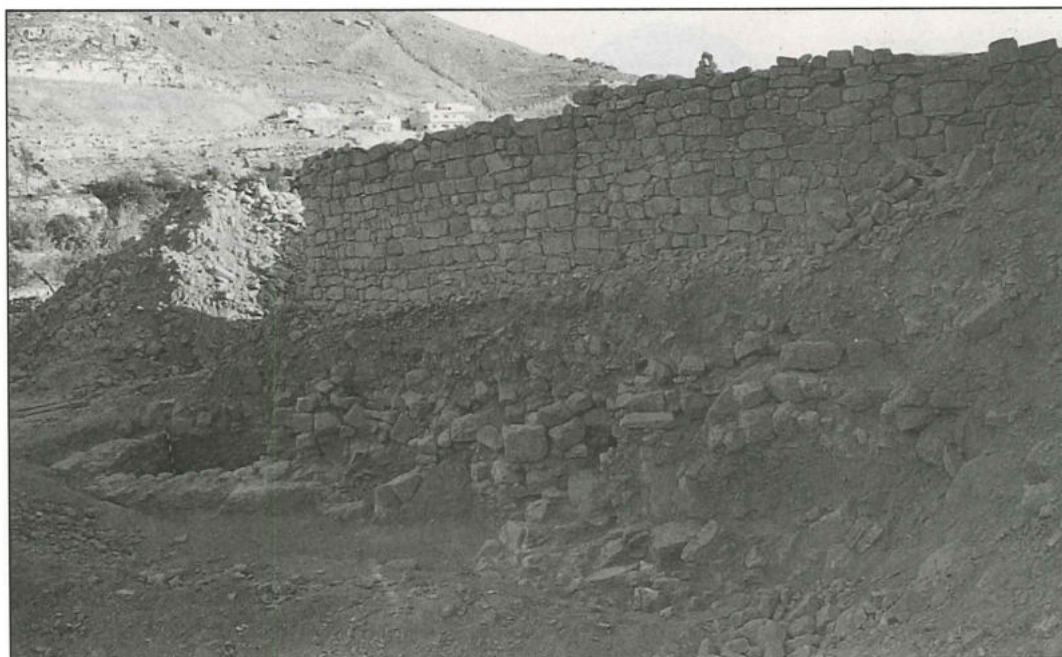
architectural elements, there is a variety of pottery vessels, as well as figurines (including a child's string-drawn toy horse, Fig. 12:1), coins and a beautiful delicate glass bottle.

The Late Roman and Byzantine Periods

The village seems to have reduced in size after the second century AD, and perhaps briefly abandoned in the late third century. After its resettlement in the early fourth century AD, the Late Roman village was much smaller than the Nabataean but still substantial (Fig. 6b). In the centre, the fourth century buildings had greatly damaged the earlier Nabataean structures, but the inhabitants rehabilitated much of the Nabataean hydraulic system as well as constructing their own small domestic cisterns (such as the one in Area V, see Fig. 5). In the western part of the village, the entrance to a Late Roman/Early Byzantine building with a staircase was excavated (Fig. 13). This structure is unique in that it does not use the terrace retaining wall as the back wall of the building, and has an entrance facing uphill. Unfortunately we could not determine whether there was another entrance facing downhill as the area was already bulldozed prior to the start of the archaeological



9. Khirbat an-Nawāfla, Nabataean pottery from the kitchen in Sq. V.05 (drawings by Q. Tweissi, H. Suyuf and S. Kabaja): 1. KN97.078 (V.05.34.29) lamp, ware reddish yellow, blackened nozzle; 2. KN97.106 (V.05.42.35) small bowl/cup with string-cut base, exterior reddish yellow, interior banded red and reddish brown; 3. KN97.073 (V.05.16.13) bowl, ware light red; 4. KN97.123 (V.05.42.35) "honey pot", rouletted decoration below rim, ware and exterior red, interior reddish brown; 5. KN97.075 (V.05.28.24) small cooking pot, ware light red, exterior pale yellow, interior light yellowish brown; 6. KN97.074 (V.05.28.23) jug, reused as cooking pot, ware light red, exterior white; 7. KN97.105 (V.05.42.35) unguentarium, ware and exterior light red, interior pinkish grey.



10. Khirbat an-Nawāfla, Section I.03: Rooms and basin associated with the Nabataean olive press (view to the southeast).

excavations.

Small finds from that era are few and other than pottery sherds mainly consist of some lamps (Fig. 14) and a few coins. However, despite the settlement gap in the late third century AD, the material culture at the site, be it pottery or construction methods, shows a clear continuity and development of the Nabataean traditions even as late as the sixth century AD. This continuity is also well attested at another major site in Wādī Mūsā, the az-Zurrāba pottery workshop ('Amr 1991).

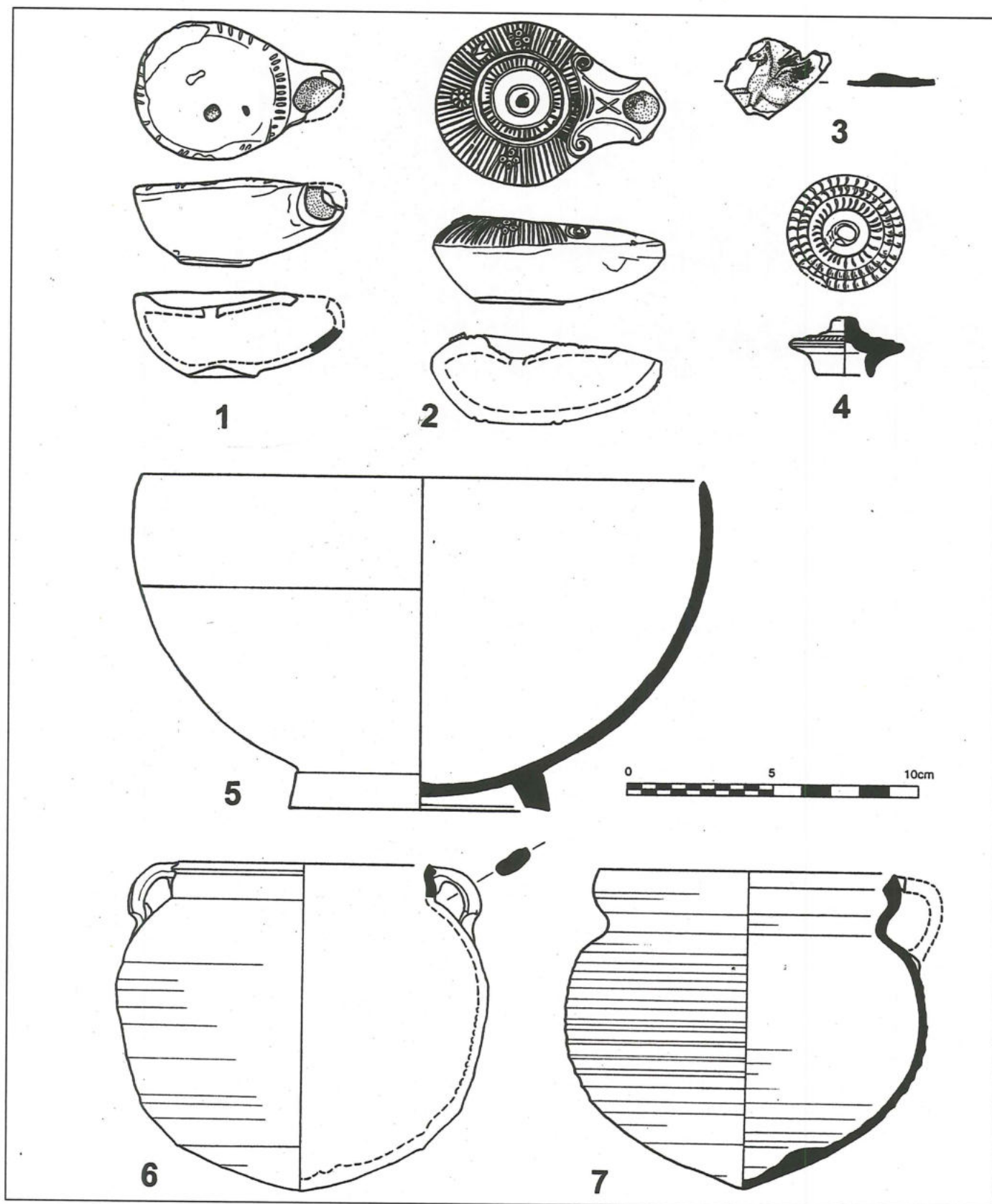
The village started to expand again during the Late Byzantine period, and the Christian population left many relics including crosses carved on stones. A monumental building in the south was constructed during this period (Area III), the function of which could not be determined as it extended under existing traditional houses. Probably it was the local church as several stones that may have been part of a church furniture were found reused in nearby traditional houses. The walls of the building—1.15m wide and partially founded on an earlier Nabataean structure—were well-constructed with cut limestone blocks. The structure continued to be used during the Early Islamic period, when an adjoining

building was constructed (during the Umayyad period and refurbished during the Early Abbasid period) thus forming a north-south street 1.0-1.20m wide.

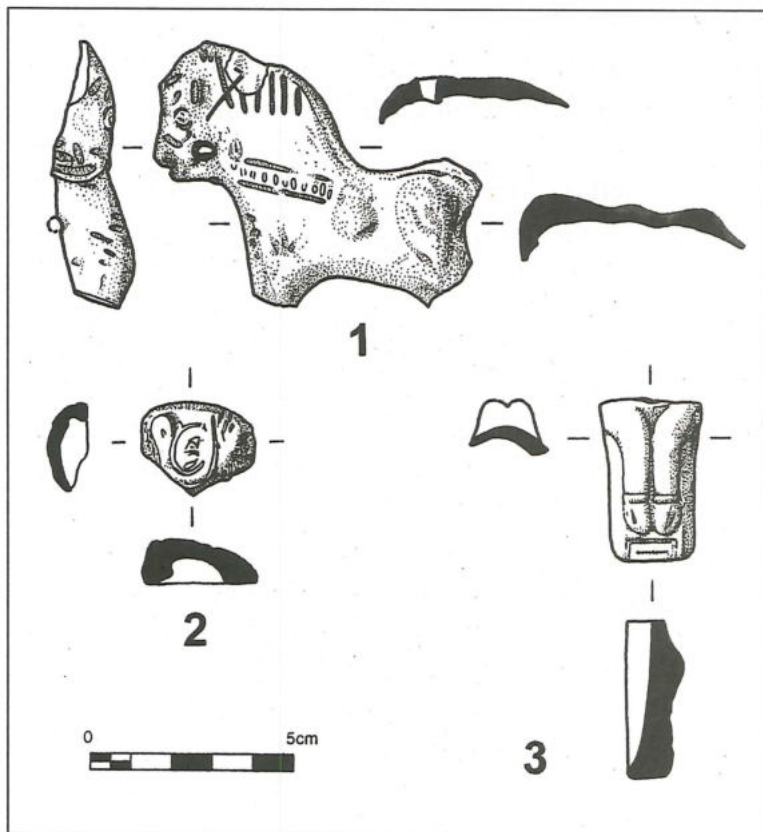
The Islamic Periods

The Early Islamic period is especially significant. The area of Petra was not mentioned in the annals of the Muslim conquests and only squatter occupation in earlier buildings is reported from archaeological excavations at Petra (e.g. Hammond 1978: 83; Schick *et al.* 1993: 59, 60). The Early Islamic village at an-Nawāfla was quite substantial (Fig. 6c) and a large building with cross arches (an *iwān*) was partially excavated in the southeast (Area II). The continuity of Christianity among the local population is indicated by the recovery from Umayyad and Early Abbasid levels of a lamp with crosses (Fig. 15: 4) and a stone "bread stamp" similar to those still used by the Eastern Church.

The relative affluence of the Early Islamic period is also attested by houses having fine arches and flagstone pavements (Fig. 16). A significant Early Abbasid inscription dated to "Sunday of Jamāda al-Ākhir of the year 170" (AH 170 = AD 787) was recovered from the site (Fig. 17, Karim



11. Khirbat an-Nawāfla, Nabataean pottery from Area I (drawings by Q. Tweissi, K. 'Amr, S. Kabaja and H. Suyuf): 1. KN97.126 (I.10.26.27) "apprentice lamp", ware light red, slip red, blackened nozzle; 2. KN97.192 (I.E.00) lamp, ware light red, slip yellowish red; 3. KN97.200 (I.E.00) lamp disc fragment with the representation of a winged horse, ware pink, slip light red; 4. KN97.133 (I.12.22.34) small lid with all-over concentric rouletted design, ware red; 5. (I.OP) bowl, ware light red, band at exterior rim white; 6. KN97.146 (I.14.55.51) cooking pot, ware light red; 7. KN97.212 (I.E.00) closed bowl, ware light red.



12. Khirbat an-Nawāfla, Nabataean terracotta figurines (drawings by Q. Tweissi): 1. KN97.188 (VII.01.04.15) part of a horse figurine, moulded and incised, perforated at head behind mouth, ware light red; 2. KN97.171 (VI.07.05.05) head of a camel figurine, ware light red; 3. KN97.141 (III.05.43.47) fragment of a "seated nude goddess" figurine, ware red-dish yellow.



13. Khirbat an-Nawāfla: Sq. IV.01 (view to the east).

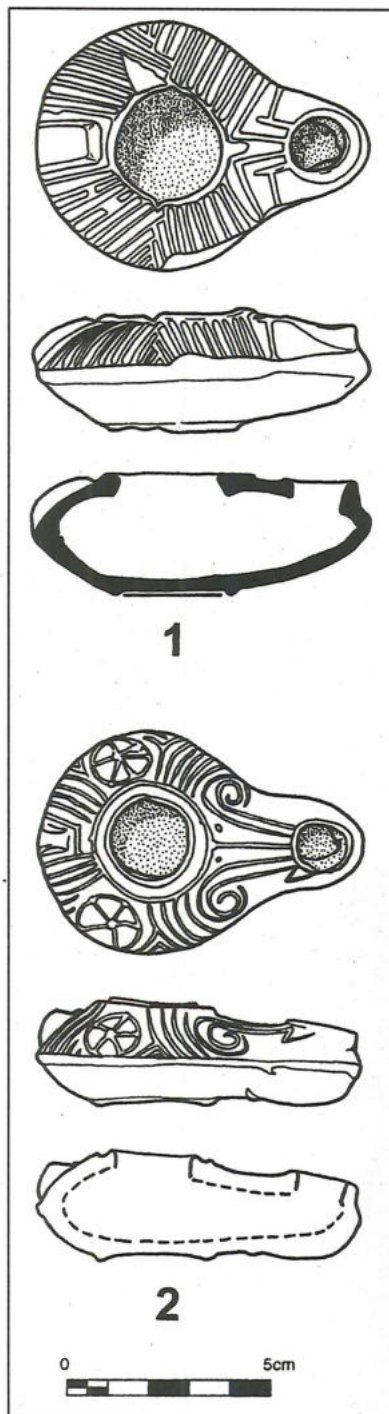
1999).³ This is—up till now—the only known inscription dated to the Early Abbasid period (132-264AH/AD 750-878) from the southern Bilād ash-Shām (Jordan

and Palestine).

The later Islamic periods, starting with the Fatimid, are the richest in terms of recovered artifacts. Numerous examples of an

3. This inscription was found prior to the arrival of the archaeological team at the site. We are grateful to Jadallah Al-Nawafleh who noticed its im-

portance and presented it to us on the first day we inspected the site.



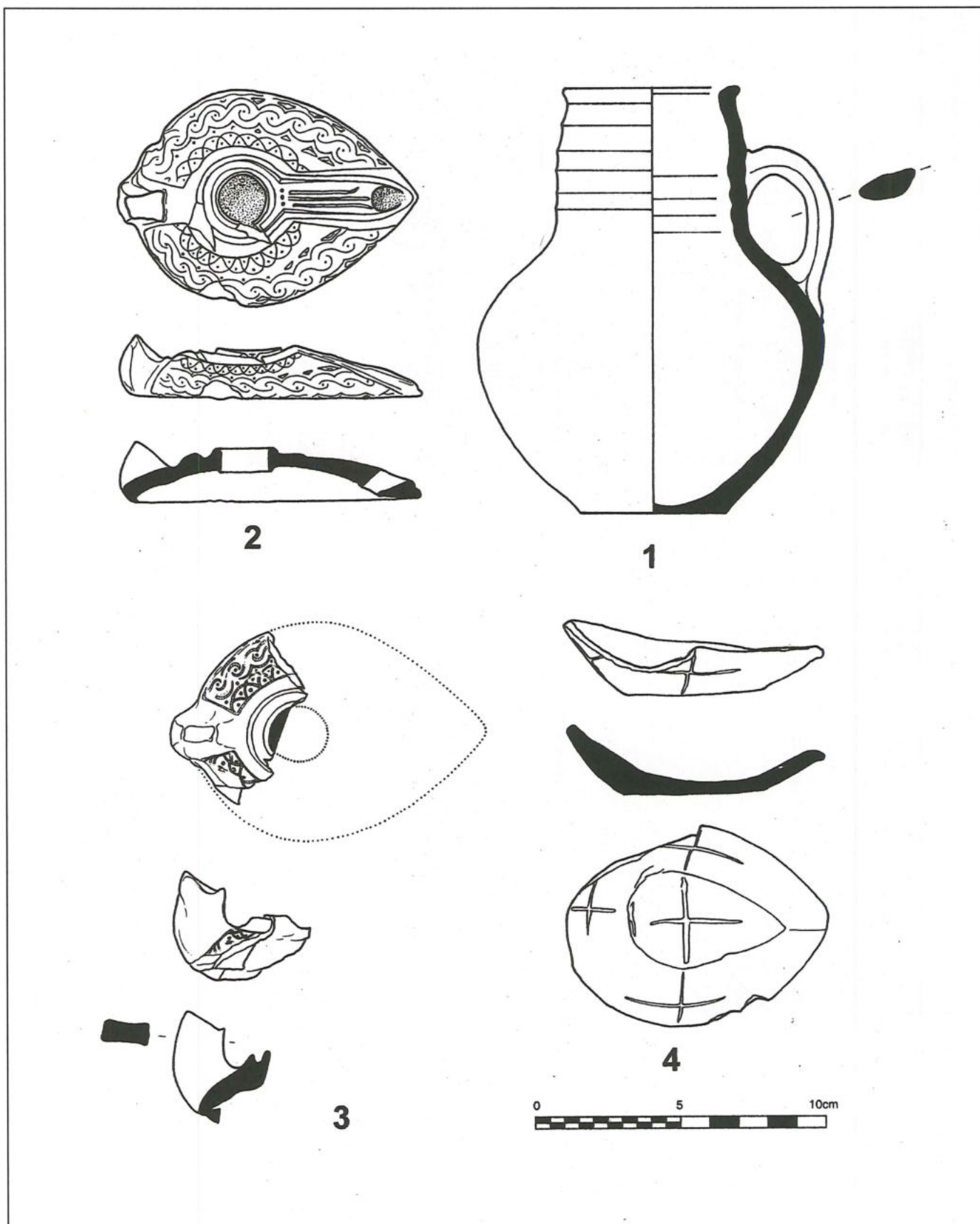
14. Khirbat an-Nawāfla, Late Roman/Early Byzantine lamps (drawings by Q. Tweissi and S. Kabaja): 1. KN97.125 (I.12.13.23) lamp, ware reddish yellow; 2. KN97.012 (IV.00.00) lamp, exterior pink, blackened nozzle.

early handmade pottery production tradition were recovered (Fig. 18). One group of “Late Islamic” pottery discovered at the nearby Khirbat al-Mu‘allaq (the decorated lids, Lindner *et al.* 1996: Fig. 24:1-7) may belong to this tradition. At Khirbat an-Nawāfla, the stratigraphic evidence indicates that this ware pre-dates the 12th century “Linear Painted”—which in turn predates the “typical Ayyubid/ Mamluk Geometric Painted” (Brown 1987: 284; 1988: 232;

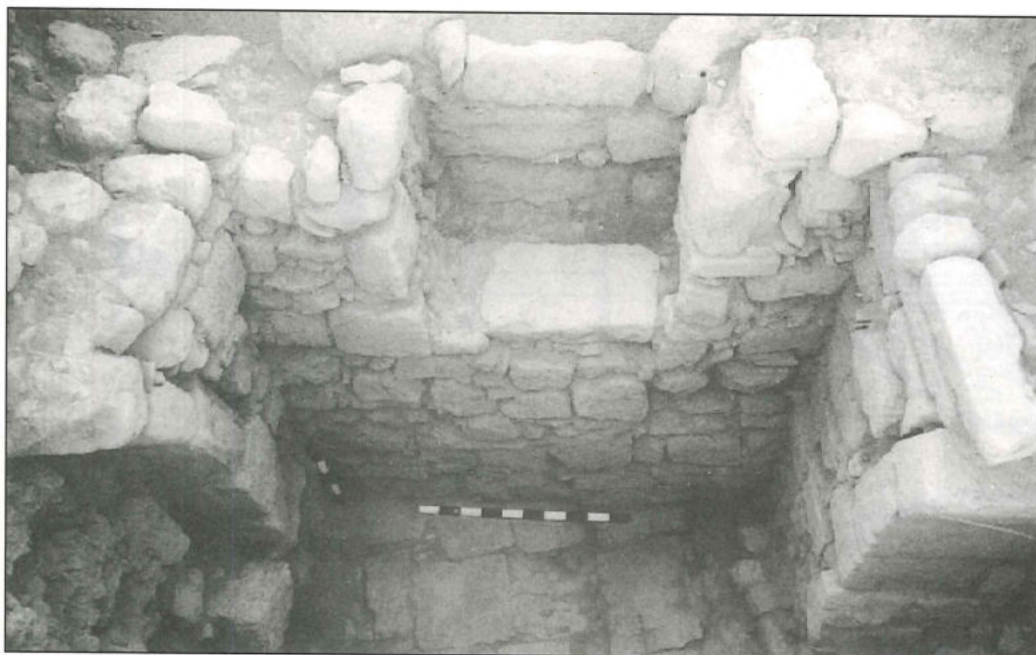
Vannini and Vanni Desideri 1995: 535; but see also Vannini and Tonghini 1997: 380 for indications that the “Linear Painted” may be contemporary with the “Geometric Painted”). The ware is clearly distinct from the hand-made Fatimid period “Tupperware” of Ayla/al-‘Aqaba (Whitcomb 1988: 212 and Fig. 5), and as noted at Gharandal (Walm-sley *et al.* 1999: 468, 472), these early hand-made wares display intense regional differences. A date within the 11th century is the most probable for the an-Nawāfla assemblage.

The Ayyubid/Mamluk village at an-Nawāfla was the most expansive at the site (Fig. 6d). Many of the excavated structures were domestic houses and courtyards. A well-preserved olive press was exposed close to the location of a modern traditional olive press at the site (Fig. 19). Other than the stone installations, remains of olive waste were recovered from a basin there. This press extends for a length of just over 39m north-south, reusing part of a monumental Nabataean structure for its western wall, as well as parts of an earlier Umayyad/ Early Abbasid olive press—the basins of which were left intact directly to the south of the Ayyubid/Mamluk remains (Fig. 20). We could not determine the full east-west extent of the press due to the destruction of the eastern edge by a wastewater trench and its extension under traditional structures, but it would have exceeded 22m. A number of Neolithic round hammer stones, from the nearby site of al-Basīṭ, were found at this olive press. Local people explained that these were “olive weight stones”, as they were also used for weighing the olives to be pressed at the two traditional olive presses at the site (one of which is still preserved, see the Architectural Conservation section below).

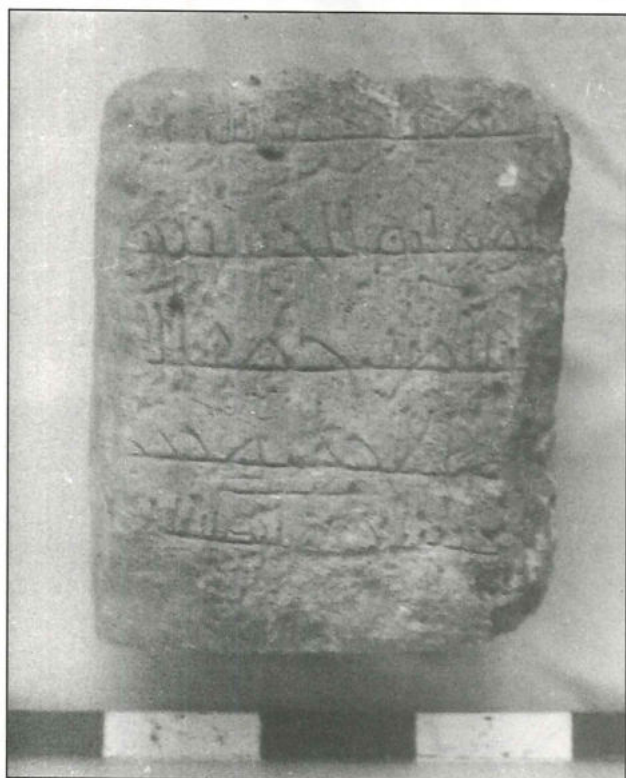
Other indicators for the daily life of people at the time included large amounts of marine fish bones, many grinding stones (some again being reused PPNB tools from



15. Khirbat an-Nawāfla, Early Abbasid pottery (drawings by Q. Tweissi and S. Kabaja): 1. KN97.118 (III.03.26.19) jug, ware: pink; 2. KN97.176 (III.07.28.21) lamp, ware pink, surface white-very pale brown, blackened nozzle; 3. (IV.03.25.22) lamp fragment, ware light reddish brown, surface very pale brown; 4. KN97.039 (II.09.06.06) base of a lamp decorated with incised crosses, ware and interior pink, exterior light reddish brown, blackened nozzle.



16. Khirbat an-Nawāfla:
Sq. III.07 (view to
the east).



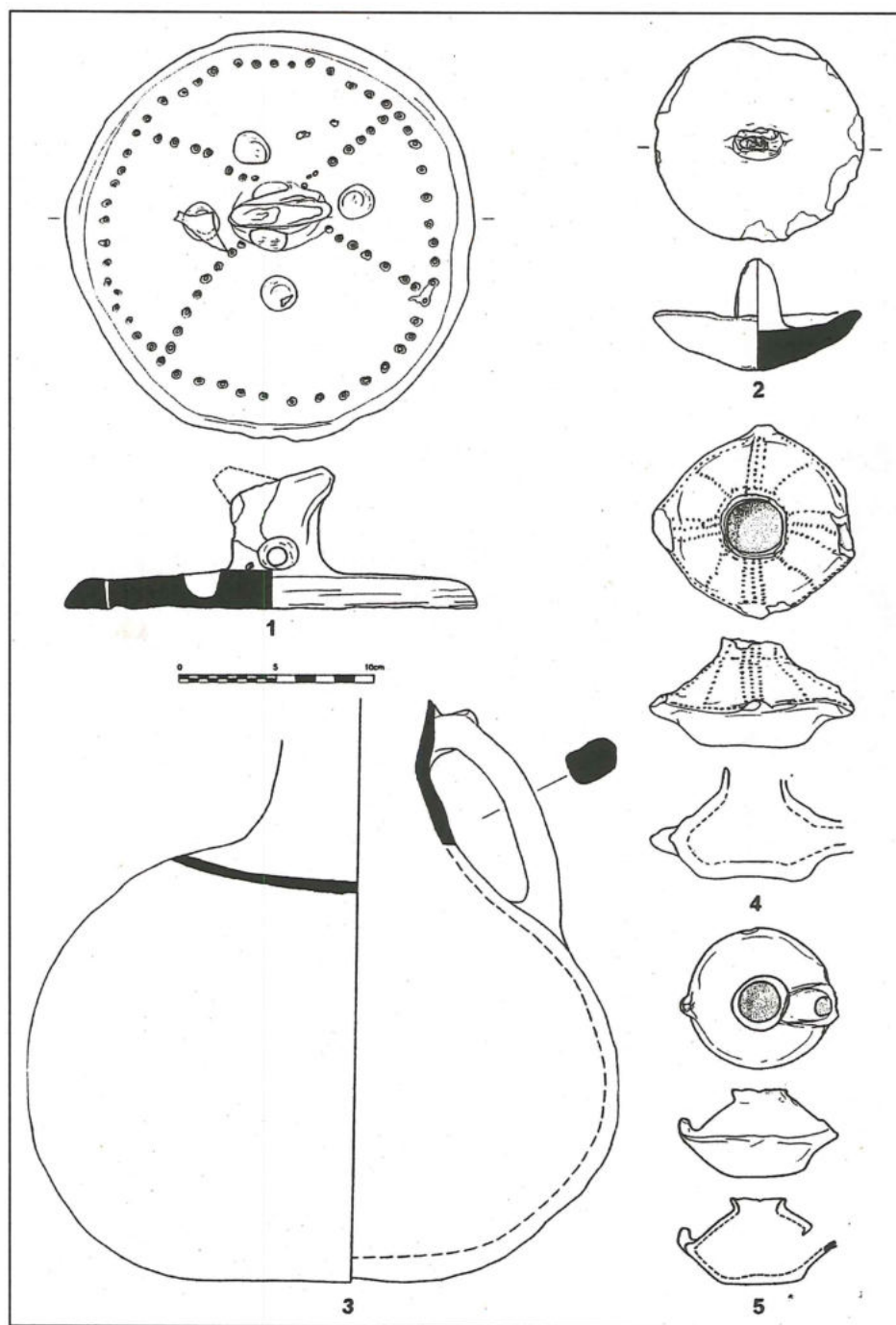
17. Khirbat an-Nawāfla: Kufic inscription dated to
Jamāda al-Ākhir 170 AH/AD 787.

the nearby site of al-Basīṭ), and agricultural tools including a complete iron sickle (Fig. 21: 2). On the industrial side, substantial amounts of iron slag were found which seem to be the result of blacksmiths forging utensils for daily use rather than arms. Several complete pottery vessels were found, many of which are jugs of varying sizes (Fig. 22).

The majority of vessels were of local production, but a few imported glazed wares as well as glass vessels were also found (Figs. 23; 24).

The evidence from the Ayyubid/Mamluk period at an-Nawāfla makes the site a prime candidate for the location of the village of al-‘Udmal, mentioned by Al-Nuwairi as a resting place for Sultan Baybars during his trip from Cairo to al-Karak in AD 1276 (Zayadine 1985). The name “al-‘Udmal” is still used for a (now dried up) water spring in the wādī directly below Khirbat an-Nawāfla (‘Amr *et al.* 1998: 519-520). It should be noted here that another Ayyubid/Mamluk village existed at the modern Wādī Mūsā town centre, just over a kilometre away from an-Nawāfla, but it was more modest and of less importance at the time.

Also from the Ayyubid/Mamluk period were two cemeteries, one in the south (Area III) and another in the northwest (Area IV). The northwestern cemetery is exceptional in that all the discovered skeletons belonged to small children, except for one adult which was a female buried with a baby *above* her arms (Fig. 25). The tradition of having a separate cemetery for children continues among the families of Wādī Mūsā up to the present.



18. Khirbat an-Nawāfla, Fatimid handmade pottery (drawings by Q. Tweissi, A. al-Momani and S. Kabaja): 1. KN97.121 (III.04.16.20) large lid with central perforated knob handle, body has lines of small round perforations and four grooves, ware unevenly fired red-pink-white-light grey, blackened at bottom; 2. KN97.122 (III.04.16.20) lid, ware unevenly fired reddish yellow-pink-brown; 3. KN97.120 (III.04.16.20) jug, ware light red-red with patches of very dark grey, remnants of slip white-very pale brown-yellowish red, interior reddish brown, painted line on shoulder weak red; 4. KN97.063 (II.06.19.15) lamp, top decorated with radiating lines of small round grooves, ware unevenly fired pale brown-greyish brown; 5. KN97.079 (I.11.21.23) lamp, ware top reddish yellow-light reddish brown, bottom reddish yellow, blackened nozzle.

The Early Ottoman period is archaeologically the least known period in Jordan. The site produced extensive evidence for this period with several terraces and houses with arched roofs, above the Ayyubid/Mamluk and directly below the present traditional buildings (which start during the late 19th century). In the houses, we excavated two kitchens, one of which had a *ṭābūn* oven. They produced a large number of pottery vessels which indicate a continuity of the earlier hand-made traditions (Fig. 26).

This is a brief summary of the evidence offered by Khirbat an-Nawāfla. The processing of the finds is still at an elementary stage but should prove an important contribution to the understanding of the material culture of the area during the past 21 centuries. Special significance lies in the stratigraphic sequence of the Islamic handmade pottery.

Architectural Conservation

In coordination with the owners of the



19. Khirbat an-Nawāfla, Sq. V.07, V.08, V.09, V.10: The Ayyubid/Mamluk olive press (view to the south).

tourist project, several excavated architectural features were designated for presentation within the tourist village. Intervention was kept to a minimum, in the form of wall and paved floor consolidation by grouting and re-pointing, consolidation of ancient mortar/plaster where it was preserved, and the addition of stone elements only where essential for wall stability or where stone loss had occurred during the intervening period between excavation and conservation (using excavation photographs and plans for the replacement of the missing elements). All restored stone elements were marked by distinctive deep oblique marking on the surfaces of the stones. The one exception to restoration was the rebuilding of a collapsed arch at the Ayyubid/Mamluk olive press in Area V.

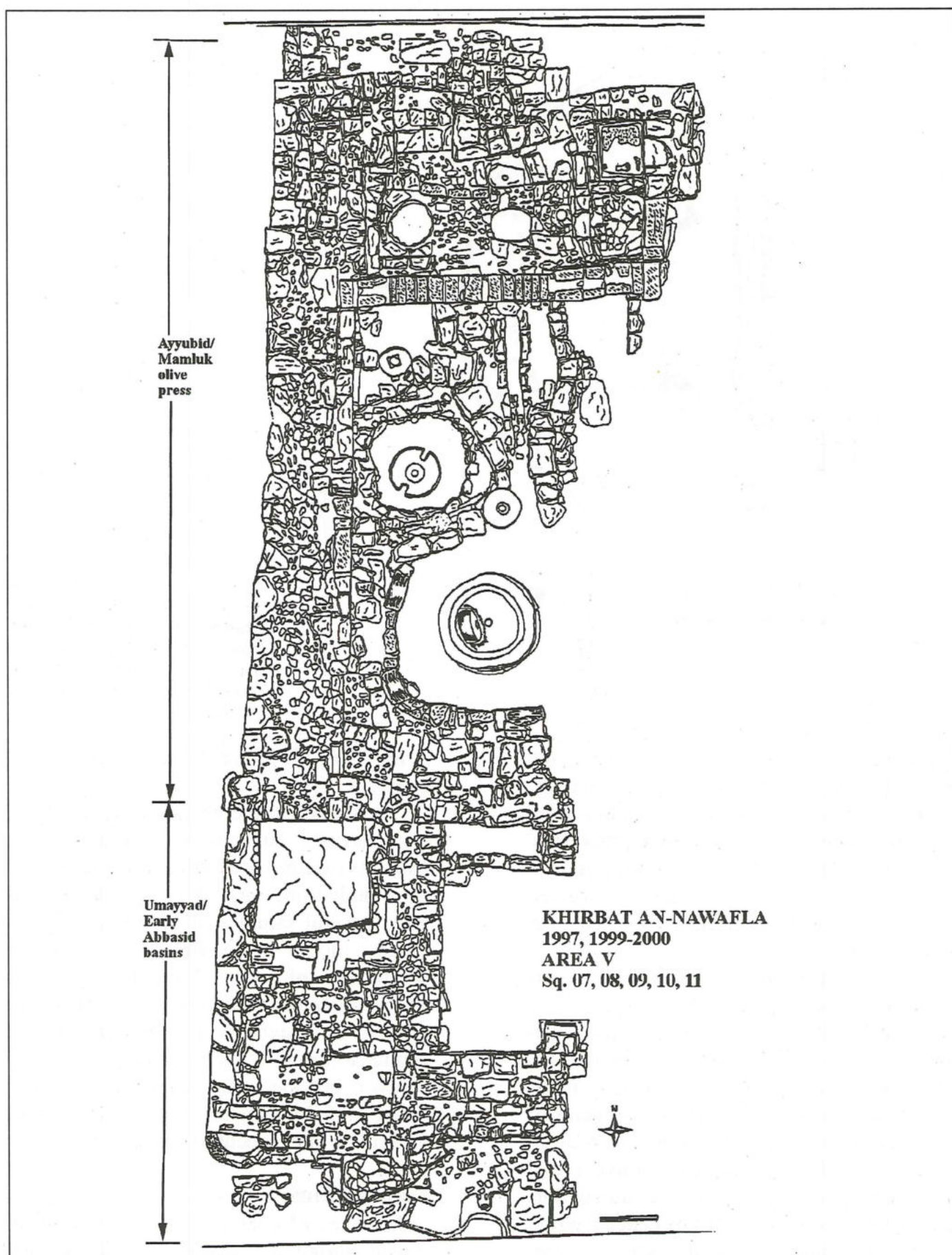
By January 2000, conservation work was carried out in two excavation areas (V and

VIII).

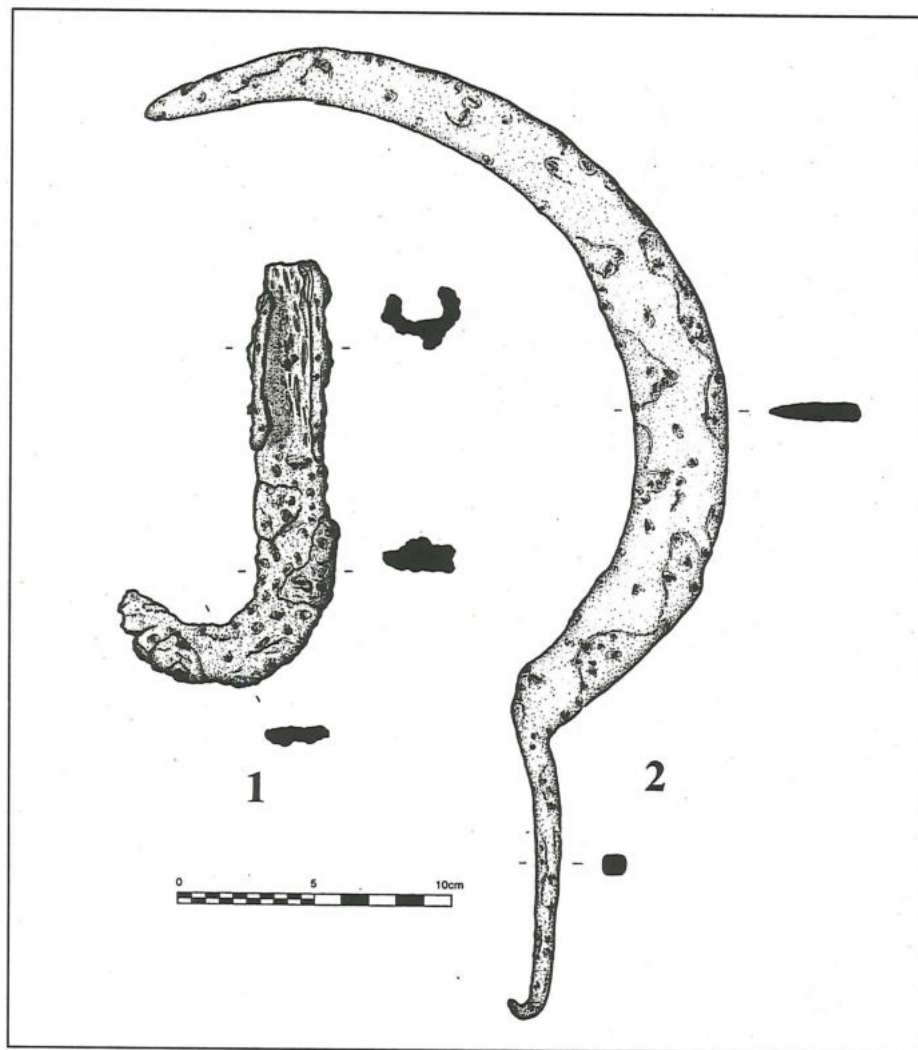
Area V (The Olive Press and “Terraces”) (see Figs. 5 and 20)

All walls in this area (whether dating to the Nabataean, Late Roman, Early Islamic, Ayyubid/Mamluk or Early Ottoman periods) were constructed of stone blocks and mud mortar. The old, loose mud mortar was removed from the wall faces and tops, the joints and stones were cleaned and wetted, and the mortar was replaced by a mixture of hydrated lime and washed red sand (ratio 1:2 by volume) that was coloured—when still wet—with soil from the immediate vicinity. Both the strength and colour of this mixture proved acceptable for consolidation work (this procedure proved acceptable even at the less-protected environment of al-Ḥumayma, see Oleson *et al.* 1999: 446-447). The same procedure was applied for the stone pavements.

The other architectural element at Area V is the mortar-lined basins and channels. The lower “Terraces” sector has one small Nabataean basin and a larger Late Roman basin, while the upper “Olive Press” sector has several Umayyad/Early Abbasid and Ayyubid/Mamluk basins and channels. The mortar-lining of all these installations, however, is surprisingly similar in that it contains substantial amounts of smooth quartzite gravel and sand, making it quite rough. The mortar-lining and supporting walls and floors were cleaned, then the supporting walls were consolidated in the above-described manner. In several areas, the bottom parts of the ancient mortar-lining were eroded, therefore the remaining parts were supported with the lime-sand consolidation mixture with an added volume of sifted dirt. The lining was subsequently consolidated with an aquatic solution (25% by volume) of a commercial water-based stone consolidant (Polybond). This solution was injected through tiny holes drilled through the lining as well as applied with a brush to the surface. After drying for



20. Khirbat an-Nawāfla, Sq. V.07, V.08, V.09, V.10, V.11: top plan (drawing by Saleh Al-Nawafleh).



21. Khirbat an-Nawāfla, Ayyubid/Mamluk iron agricultural tools from Area III (drawings by Q. Tweissi): 1. KN97.239 (III. 09.08.130); 2. KN97.148 (III. 03.26.20).

24 hours, the upper edges were consolidated with the lime-sand consolidation mixture. Finally, when the edging consolidation mixture was dry, the lining was further consolidated with a 50% (by volume) aquatic solution of (Polybond), again injected through the lining as well as brushed over the surface.

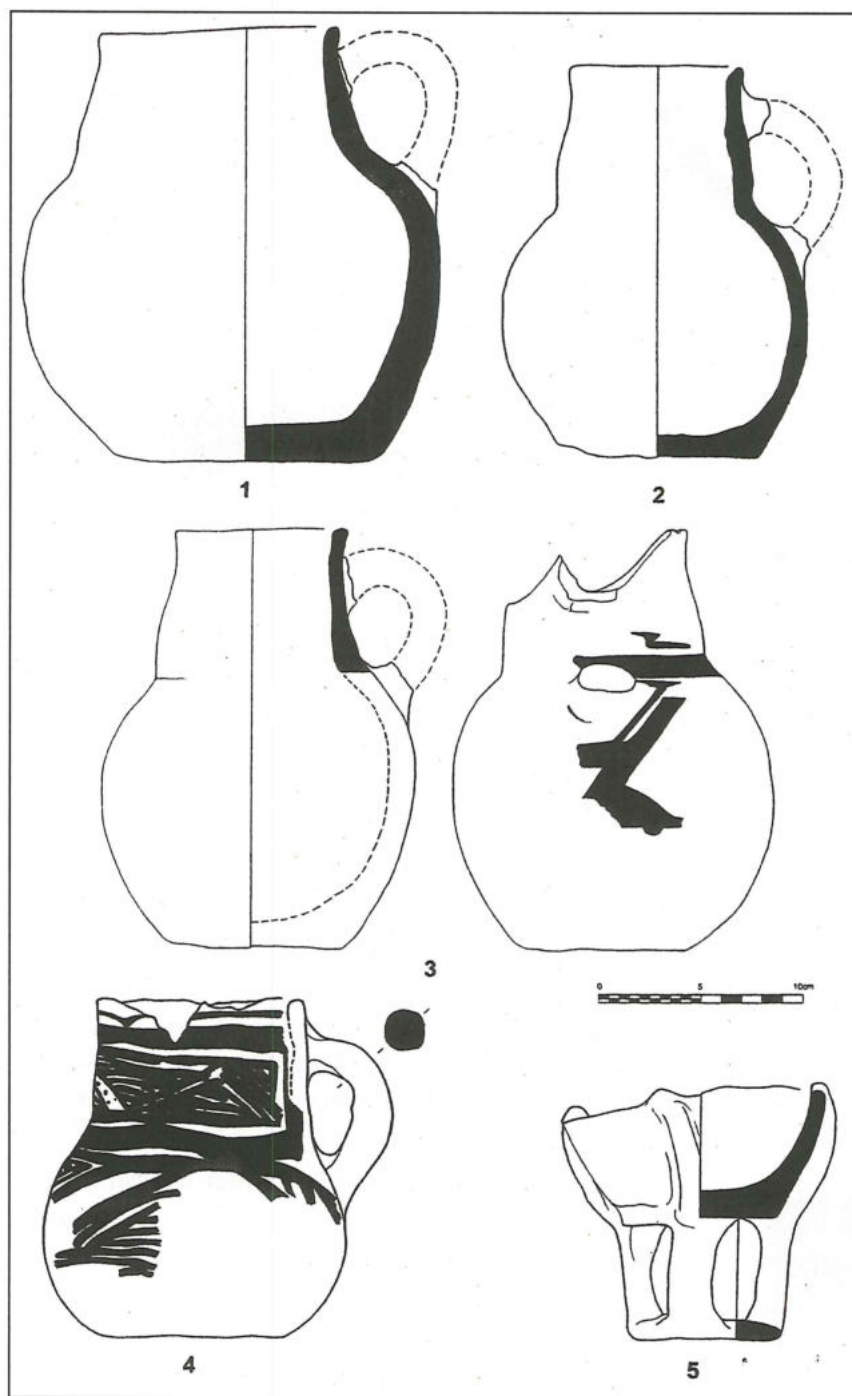
In addition to the conservation of the archaeological olive press, the archaeological team restored a traditional olive press (dating to the early 20th century). This modern olive press was originally in a nearby traditional structure (Fig. 27). The constituents of the press were moved to a flat "green area" adjacent to the archaeological olive press, and the wooden elements were restored, thus also giving the viewer a better understanding of the operation of the press, which is similar to that of the ancient olive press.

Area VIII (The Open Cistern) (see Fig. 7a and b)

The cistern at the entrance to the village was partially cut into the mountain-side, while its external southern and western walls were built using large hard limestone boulders. Several samples of the remaining hydraulic mortar were analysed at the laboratories of the Natural Resources Authority and the University of Jordan. The walls of the cistern were treated in a manner similar to those of the structures of Area V (above), but the consolidation mortar consisted of 5vols sand: 1 vol hydrated lime: 0.25vols white cement: 0.25vols ash.

Future Plans

Work at Khirbat an-Nawāfla will be resumed during the second half of the year 2000 with the architectural conservation of



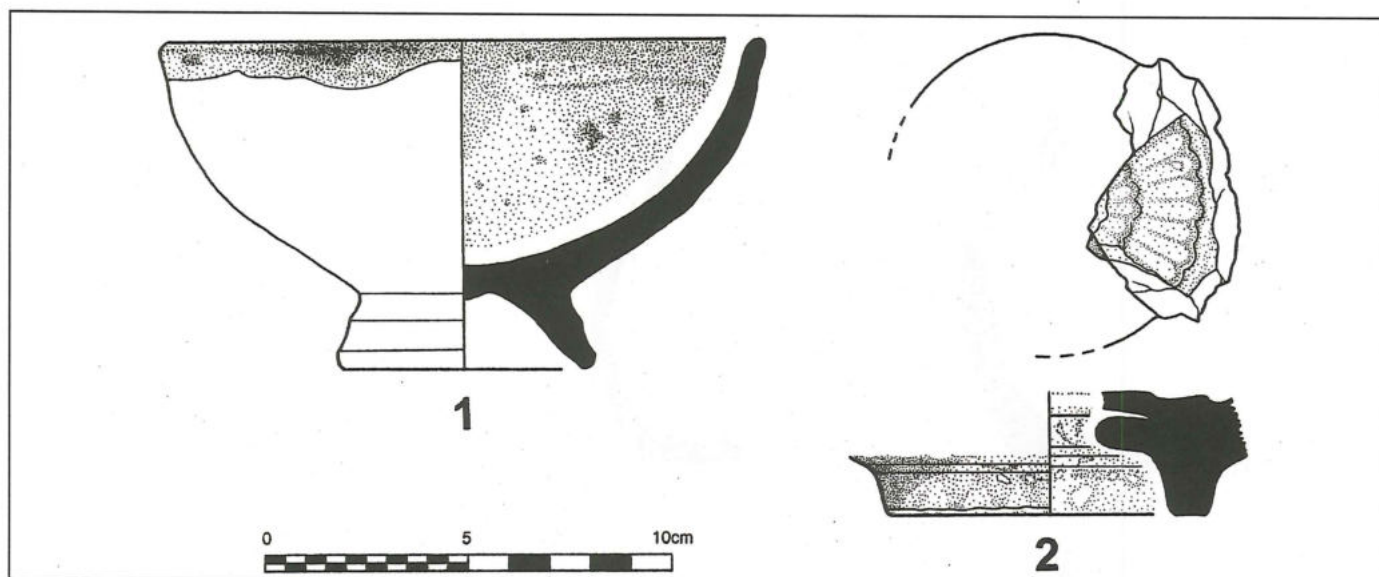
22. Khirbat an-Nawāfla, Ayyubid/Mamluk handmade pottery from the storage area in Sq. V.01 (drawings by Q. Tweissi, A. al-Momani and S. Kabaja): 1. KN97.117 (V.01.01.06) jug, ware light red, exterior dark grey, remnants of thick slip white; 2. KN97.114 (V.01.01.06) jug, unevenly fired ware (burnt?) light reddish brown-dark reddish grey, remnants of slip very pale brown-pinkish grey; 3. KN97.116 (V.01.01.06) jug, ware yellowish red, exterior fired dark brown, slip very pale brown-reddish brown, paint red-dusky red; 4. KN97.111 (V.01.01.06) jug, ware light red, slip white, paint dark reddish grey; 5. KN97.113 (V.01.01.01) tripod chalice, ware light red, surfaces dark brown-dark grey.

two more sectors of excavation in Area III, which will be presented within the reception and administration areas of the tourist village.

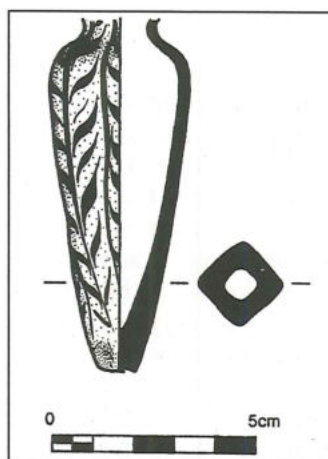
A site museum is also planned to house the finds from the excavations. The museum will be within three renovated traditional buildings and two joining courtyards at the entrance to the tourist village. One of these structures used to be the *maḍāfa* or guest house of the village.

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23. Khirbat an-Nawāfla, glazed Islamic pottery (drawings by Q. Tweissi and A. Omeish): 1. KN97.205 (III.09.12.17) bowl, glazed on the interior, wheelmade, ware reddish yellow, exterior very pale brown, glaze olive at rim-olive yellow at interior base; 2. KN97.244 (VI.11.11.07) imitation celadon bowl base fragment, wheelmade with moulded peony motif on base interior, ware red-light yellowish brown, glaze light olive grey.



24. Khirbat an-Nawāfla, Mamluk glass vessel (drawing by Q. Tweissi): KN97.186 (III.09.02.03) black with brown, cream and grey variegations.



25. Khirbat an-Nawāfla, Sq. IV.02: "Mother and child" burial (view to the north).

gineers), as well as the contractor (Samerco) site team, most of whom became personal

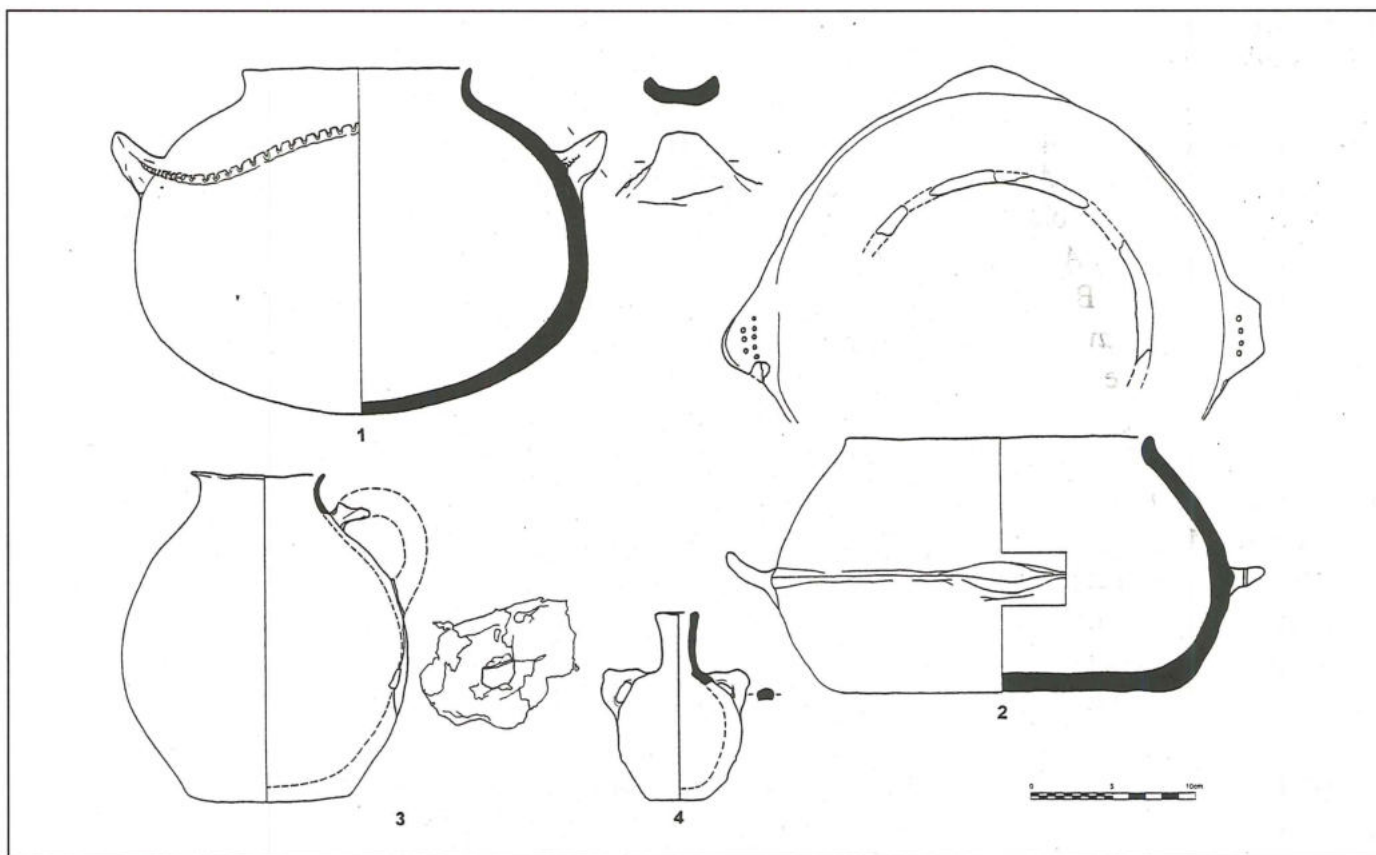
friends. Foremost, we would like to thank the "Al-Nawafleh", the generous people who built the village, and worked hard during the process of recovery of its history.

Jadallah Al-Nawafleh is a special person who vigilantly watched the bulldozers for long hours throughout the construction of the tourist village. Without his persistent efforts and keen involvement, we would not have been able to recover much of the information and finds from the site.

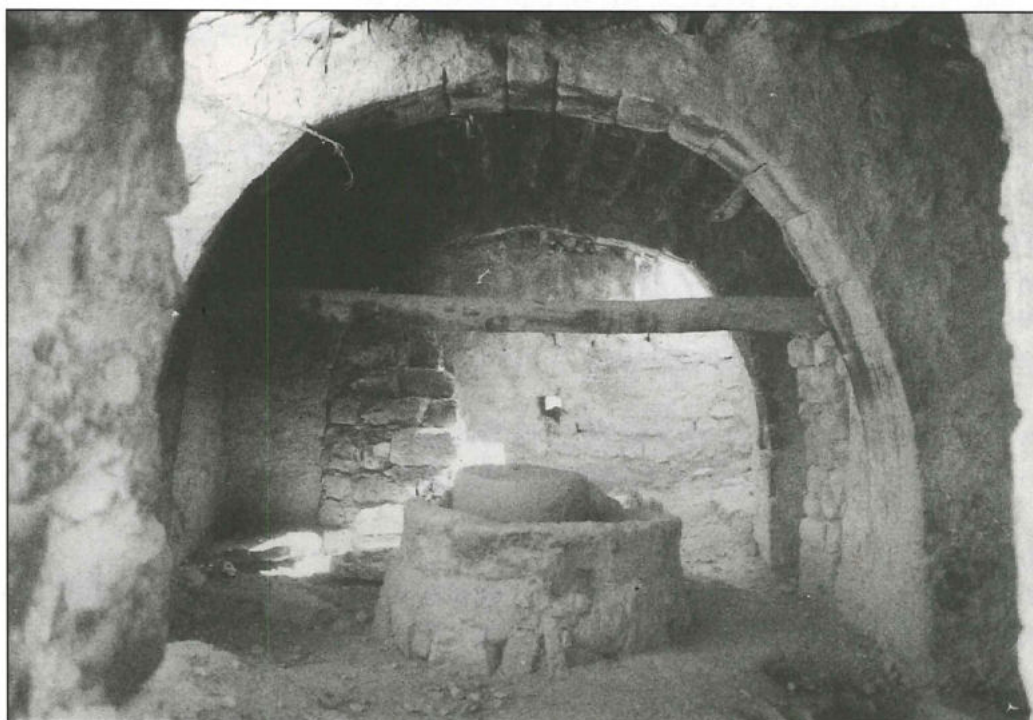
Special thanks to Dr Kamel Mahadin, ex-director of the PRPC, for without his support the 1997 season would have ended in July instead of December.

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K. 'Amr,
A. al-Momani,
N. Al-Nawafleh,
S. Al-Nawafleh,
Department of Antiquities,
Amman and Wādī Mūsā - Jordan.



26. Khirbat an-Nawāfla, Early Ottoman handmade pottery (drawings by Q. Tweissi, A. al-Momani, K. 'Amr and S. Kabaja): 1. KN97.127 (V.05.49.39) cooking pot with elephant ear handles and rope decoration, handmade, ware light reddish brown, exterior much blackened; 2. KN97.197 (II.13.18.21) cooking pot with four ledge handles (two perforated), exterior light red-reddish yellow-grey, interior reddish yellow-grey; 3. KN97.107 (I.11.20.21) jug, parts of body spalled during firing, one with hole through the body mended by a small stone plug and plaster, unevenly fired ware light red-pink with large patches of reddish grey and grey; 4. KN97.066 (I.11.11) small jar with two handles, has remains of grey plaster used to mend areas of the body that had flaked off due to spalling during firing, surface lightly polished, unevenly fired ware brown-reddish yellow-greyish brown.



27. Khirbat an-Nawāfla: Traditional olive press in its original structure.

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