

Cultural Identity and Wine Production in Northern Jordan

Introduction

A significant number of rock-cut wine presses were discovered in the hilly areas east of Pella (Ṭabaqat Faḥl) during the Pella Hinterland Survey of 1994-1996 (PHS)¹. Situated in the rising foothills on the eastern side of the north Jordan Valley, Pella has been settled almost continuously from the sixth millennium BC, while human activity in the vicinity dates back to half a million years ago (McNicol *et al.* 1992; Edwards and Macumber 1995). The findings of the hinterland survey reflect this long history of occupation, revealing a fluctuation in dominant site typologies depending on the period and the prevailing cultural conditions. This is apparently the case for the rock-cut installations identified as wine presses. Here the evidence points to a flourishing industry that emerges in the Roman period and disappears after the end of the Byzantine period (first century BC – seventh century AD). This paper will focus on the wine presses discovered in the survey, their distribution, quantity, typological variation and chronology. Such information can then be added to the growing corpus of knowledge of ancient viticulture in the Levantine regions east and west of the Jordan River. Seen in the context of associated settlement patterns certain socio-economic inferences can be drawn. Within an historical context, the flourish of this industry can be viewed as a practical expression of cultural identity during the period of Graeco-Roman hegemony.

Quantity and Distribution

The survey covered 36 km² around the urban centre of Pella, extending more to the hilly areas in the east (to a distance of 4km) than to the west (2km) where modern urban and agricultural developments on the valley floor have made survey difficult. As shown on the map of the

survey area (FIG. 1) the coverage was divided into three sectors, one for each season of work. The 1994 season dealt with the north east sector (1), the 1995 season with the south east sector (2), and the 1996 season with the west sector (3). The entire landscape was intensively surveyed, walking transect lines spaced at 20m apart, integrated with aerial photographs and topographic maps (Watson and O'Hea 1996: 63-4).

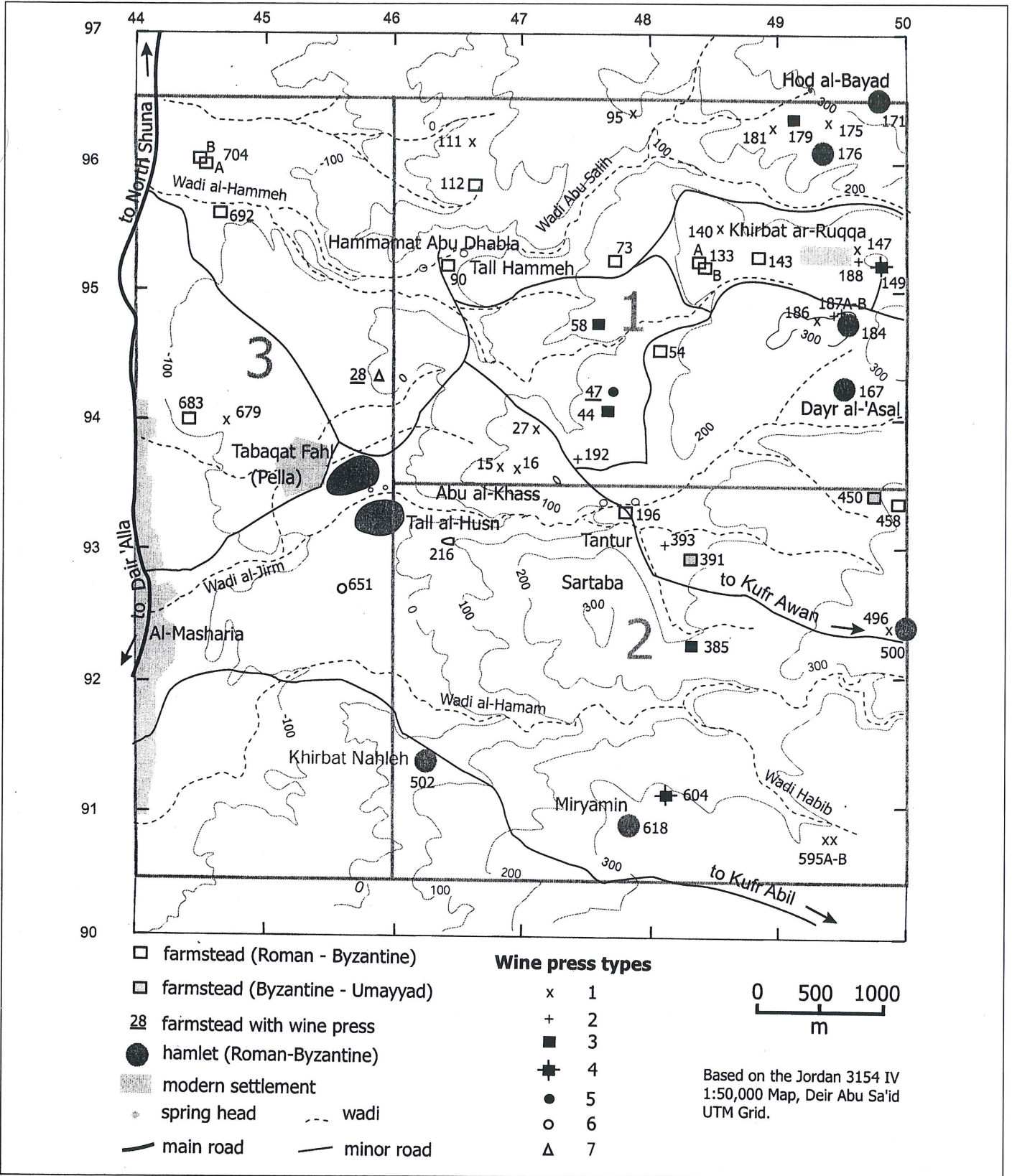
Sector 1 contains the majority of presses (nineteen, one of which is a tentative attribution), sector 2 contains six presses, and sector 3 contains two, possibly three presses, making a total of 28 in all. It seems that the majority of vines were cultivated in the northeastern area, although the terrain in the southeast is similar. It comprises a Mediterranean maquis of rising limestone hills with numerous bedrock outcroppings amid pockets of residual dark brown rendzin and occasional terra rossa soils, occasional oak trees and scrub, broken by narrow, sometimes deep wadis. They occur in altitudes ranging between 60-380 metres above sea level. The western sector is lower, comprising low bare hills and arable plateaus cut by steep wadis. Here, one press lies at minus 116m while the other two are just above sea level. The Jordan Valley floor on the western boundary of our survey area descends to minus 220m. The higher hilly terrain is more suited to vine cultivation, although the concentration in the north east rather than the south east must reflect factors other than geographical suitability, as the areas are physically similar.

Types of Wine Presses

The presses are, with one possible exception at Site 28, hewn out of the bedrock. Being predominantly limestone with considerable bedrock exposure, the countryside lends

¹ The Pella Hinterland Survey was supported by the British Institute at Amman for Archaeology and History (now the Council for British Research in the Levant) and the University of Adelaide. It was directed jointly by the author (BIAAH) and Dr Margaret O'Hea (Adelaide). For a discussion of the first season's findings, including a pre-

liminary interpretation of the wine presses, farmsteads and small forts, see Watson and O'Hea 1996. The number of identified wine presses for this sector has been reduced in the present catalogue (TABLE 1), removing some tentative attributions to Type 6 (discussed below).



1. Map of the Pella Hinterland Survey area.

itself to easy quarrying in most locations. The wine presses take a number of different forms, but there are certain basic requirements for the process: an impermeable flat floor of at least shallow depth for treading/pressing the grapes, sloping slightly towards a deeper vat to receive the juice, and a method of channelling the juice between the two features.

As this was a survey project employing only limited excavation for occasional clarification (small soundings and clearances), most of these presses and their surrounds were not excavated. In many cases they were heavily silted and potential features may have been obscured. Classification was based on broad morphology and immediately visible features. No two presses were ever exactly the same and each type incorporates a number of variations.

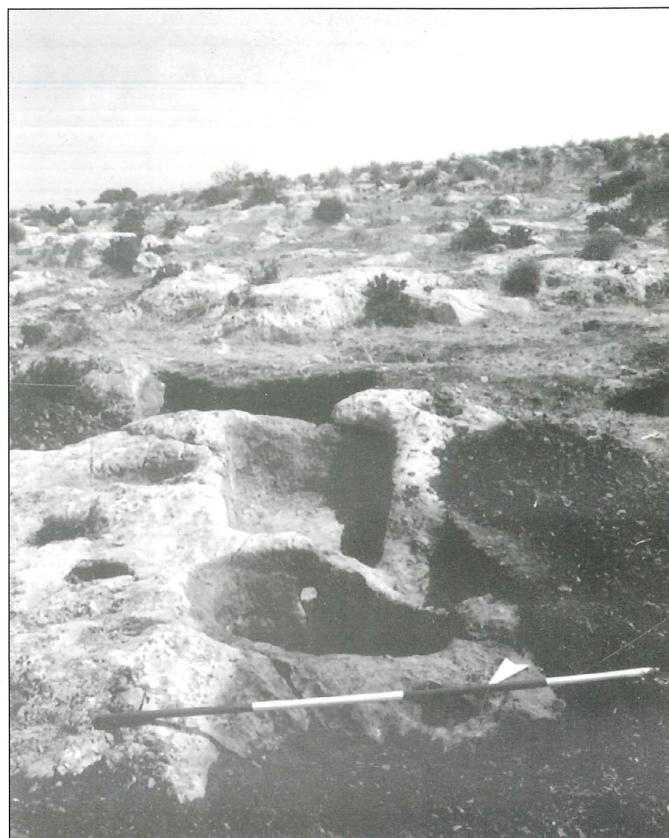
A table of the wine press types found in the Pella hinterland is presented in TABLE 1. The idiosyncrasies within each type are revealed in the list of associated visible features. Full excavation of each press would of course add to and refine this list, which serves rather as an indication than a comprehensive inventory. However any features that can be seen may provide information on the processing methods employed and are therefore significant. It is not the purpose of this paper to describe in detail the processes used in wine production as this has been amply presented elsewhere. Where some discussion is necessary, reference will be made to more comprehensive sources where further details can be found.²

Type 1

1a) This type comprises a small, rectangular rock-cut treading floor or basin channelling into an oval vat. It was the most common type of wine press encountered, amounting to 13 examples distributed throughout all sectors of the survey area (FIGS. 1-11).

1b) As above, but with an oval treading basin and square vat. The single example recorded (Site 496) has an enclosed channel between basin and vat.

None of the treading floors are longer than two metres or exceed one and a half metres in width. They range in depth from 10-90cm. The majority (ten) has an enclosed channel (subterranean rock-cut pipe or conduit) leading from the basin floor to the vat, three examples have an open narrow channel, and one has a simple wide drop to the vat. The vats are relatively smaller in size but deeper than the basins (35-120cm). One of the few vats that was excavated, Site 27 (see FIG. 2) (Watson and O'Hea 1996: 72, Fig. 8 plan), has a small circular depression in its floor, a feature known from other sites (for example, Dar 1986: Fig. 14). This would have been useful in separating



2. Site 27, Abū al-Khass, wine press of Type 1. View southeast, showing vat with basin behind. Cupholes and pole mortise are visible to the left of the basin.

the lees (sediment) from the clear juice.

Cupholes and small basins (Type 1): Cupholes (small round depressions in the bedrock, less than ca. 20cm in diameter, of varying depth) are generally present in the vicinity, as they are with most press types. Their function can only be surmised but was no doubt various (see discussion by Åhlström 1978: 44f.). By location and shape, some would be suitable for the insertion of upright poles; others may have supported round-bottomed jars (FIGS. 3-5). Site 175 has numerous examples; the cuphole on the treading floor in front of the channel may have served to collect sediment (FIGS. 6 and 7). Three sites have small basins (round depressions larger than cupholes) nearby. The oval basin (68 x 46cm) associated with Site 16 is connected by an enclosed channel to the far end of the basin away from the vat (FIGS. 8 and 9). This would have been used for holding grapes, with the facility to collect the juice from the natural pressure of their weight, prior to treading. Such juice was particularly valued (Forbes 1965: 115). Another example (Site 147, FIG. 10) has a treading

² Useful discussions of the technology and processes of ancient wine production in the Middle East can be found in Forbes 1965,

Åhlström 1978; Roll and Ayalon 1981; Hirschfeld 1983 and 1991, and Dar 1986.

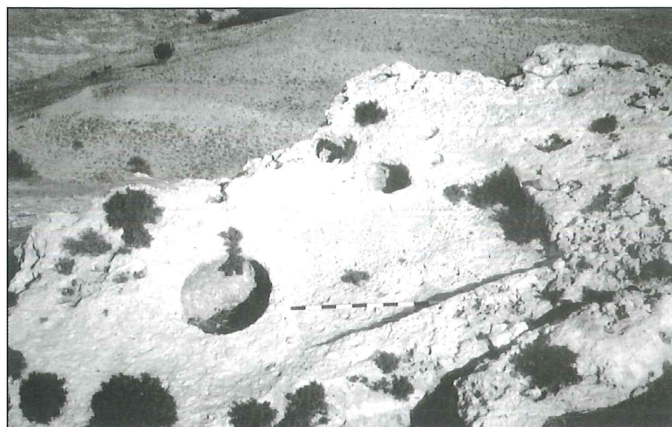
TABLE 1. Table of wine press types.

Pella Hinterland Survey: Table of Wine Press Types

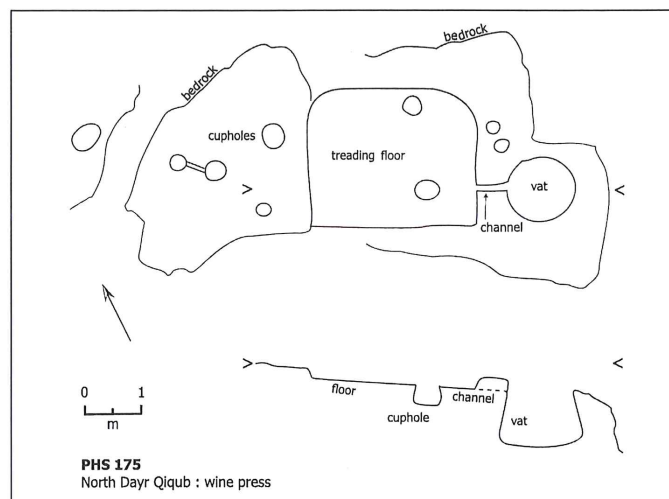
Type	Description	Site No.s	*Visible Features	Floor (cm)			Main Vat (cm)		
				L	W	D	L	W	D
1a	Rock-cut rectangular treading floor / basin with oval vat	15	< ‡	200	110	?	>45	>80	?
		16	< ‡ §	175	100	60	100	85	?
		27	< ‡ ©	210	125	55	112	98	70
		95	© ‡	175	88	33	100	95	57
		111	< © →	200	125	75	115	95	?
		140	‡	150	77	43	110	70	60
		147	‡ §	115	68	23	58	48	45
		175	© →	120	100	10	50	46	40
		181	© →	180	102	12	70	64	50
		186	© ↓	185	150	90	174	95	35
		595A	< ‡	120	70	60	86	73	75
		595B	< ‡	134	110	56	128	112	120
		679	< © ‡?	145	135	22	110	92	>40
1b	Rock-cut oval treading floor with square vat	496	‡	250	175	45	110	110	80
2	Shallow natural bedrock treading floor with oval vat	187A	§ ↓	100	100	<10	100	100	66
		187B	© ↓	200	100	<10	100	100	?
		188	→	175	150	12	104	93	60
		192	© →	400	200	5	60	60	>23
		393	↓	120	100	15	120	94	65
3	Square rock-cut treading floor, sometimes tessellated°, with oval vat	44	Π →	386	368	26	137	135	>96
		58?	Π	300	300	4	-	-	-
		179	© →	110	140	20	70	70	>50
		385	§ →	120	140	10	70	70	35
4	Square rock-cut treading floor, tessellated, with multiple vats and basins	149	Π ✕ → ‡	369	356	24	?	?	?
		604	Π ✕ ‡	310	275	65			
5	Circular rock-cut treading floor, tessellated, with central square vat and multiple vats	47B	Π © § < ‡ →	500	500	50	80	65	60
6	Small oval hand pressing basin with channel to rectangular vat	651	→	45	40	20	70	30	46
7	Wine pressing installation in built structure	28?	Π	-	-	-	-	-	-

*** Key to Features**

- < treading basin has mortises for insertion of a pole
- © cup holes nearby
- § adjacent basin/s
- ‡ enclosed channel or conduit between treading floor and vat
- open channel between treading floor and vat
- ↓ wide drop from treading floor to vat
- ✕ central hole in treading floor
- Π mosaic floor



3. Site 181, Umm al-Khanāzir, wine press of Type 1. View west, showing basin, vat and cupholes. The bedrock slab has broken off from a cliff to the right of the picture frame, and lies tilted towards the viewer.



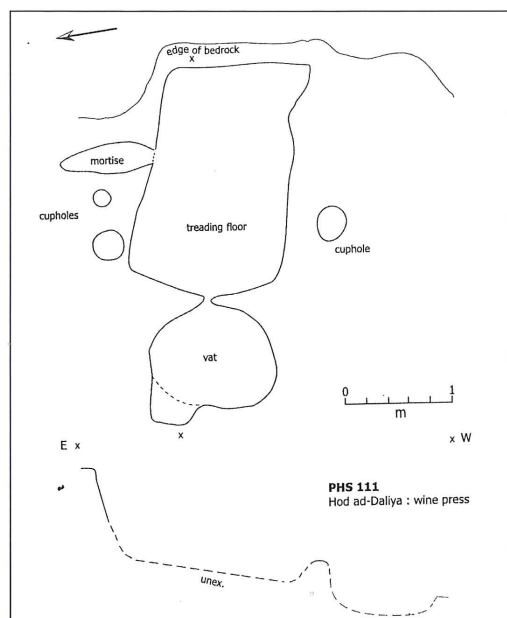
6. Plan of Site 175, wine press of Type 1.



4. Site 111, Hawd ad-Dāliya, wine press of Type 1. View northeast, showing silted vat and basin, with cupholes and long pole mortise beyond.



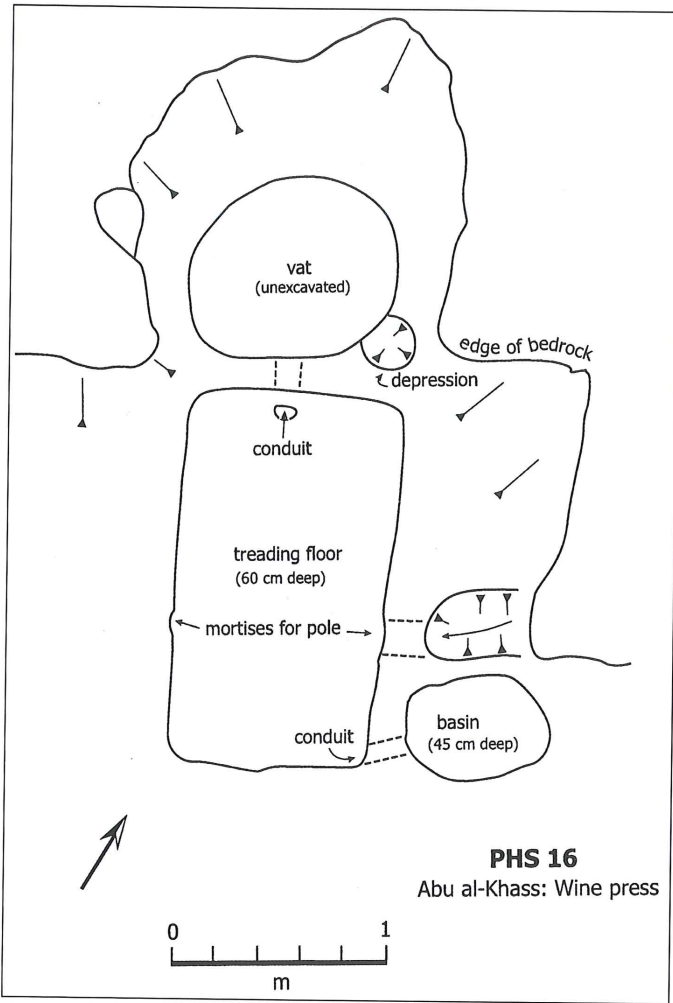
7. Site 175, Dayr Qiqub north, wine press of Type 1. View east, showing basin and cupholes. The vat is beyond the metre rod.



5. Plan of Site 111, wine press of Type 1.

floor whose far end drops away 13cm along its width to a lower basin, possibly for holding more grapes while others are being pressed. It would also have collected the juice from static pressure. Other examples are simple broad basins located to one side with no connecting channels, useful to contain the grapes waiting to be processed.

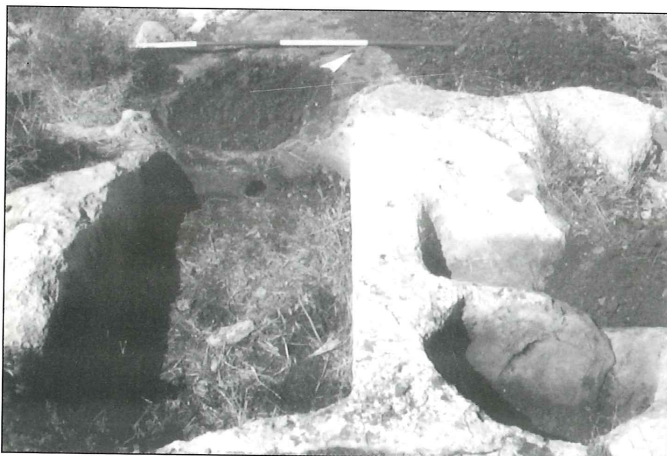
Pole Mortises (Type 1): Over half of the Type 1 presses have mortises on either side of the treading basin, presumably for the insertion of a horizontal pole. In five instances, these take the form of a long open channel on one side, semi-circular in section, which then tunnels through the basin wall, presumably for insertion of the pole from the side. The end of the pole is then pushed into a round depression in the opposite wall of the basin. They are located just over halfway along the basin away from the vat (FIG. 8). Two presses (595A and B) are different in that the mortises are positioned towards the end of the basin, set in the bedrock back from the rim, forming two semi-circular channels into which the pole would



8. Plan of Site 16, wine press of Type 1.



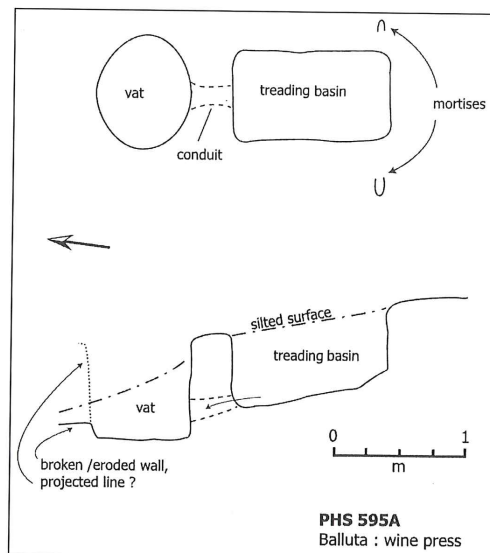
10. Site 147, Khirbat ar-Ruqqa, wine press of Type 1. View southeast, showing holding basin, treading basin and vat.



9. Site 16, Abū al-Khass, wine press of Type 1. View northwest, showing silted basin and vat. The secondary basin and pole mortise are on the right.

have slotted from the top (FIG. 11).

The function of this feature is uncertain. In these small installations the grapes were initially pressed by the time-



11. Plan of Site 595A, Ballū a, wine press of Type 1, showing pole mortises to rear of basin.

honoured method of treading with the feet (Forbes 1965: 138f.). In order to maximise the amount of juice extracted, a second pressing of the crushed grape skins was desirable. The Greeks invented a simple beam-press to do this and the practice spread throughout the Middle East from the Hellenistic period onwards, replacing the traditional bag press (Hamilton 1935: 114-115, Pl. LXVI; Forbes 1965: 116, 122, 140-42; Åhlström 1978: 43; Hirschfeld 1983: 209-10; Hirschfeld and Birger-Calderon 1991: 95, Fig. 15). The beam acted as a lever, with a fulcrum at one end and the other end weighted by stones or people, or the action of a screw. An even pressure would be applied to a pile of layered grape skins separated by mats placed in the middle of the basin. None of the published presses with evidence for this feature correspond to the PHS Type 1 press. They are always larger more complex installations. The fulcrum is in the form of a recess at the rear of a large treading floor, often with a central vat (see PHS Type 5 below). However one could postulate that the horizontal beam in Type 1 served to anchor a small pressing beam or board operable by one person. Alternatively, although the crossbeam would be too low to provide direct support for the treader, it may have anchored ropes for the treader to hold, providing a useful aid in a slippery task. The use of supporting ropes in larger presses (usually from above) is well attested (see Åhlström 1978: 30-34; Forbes 1965: 139).

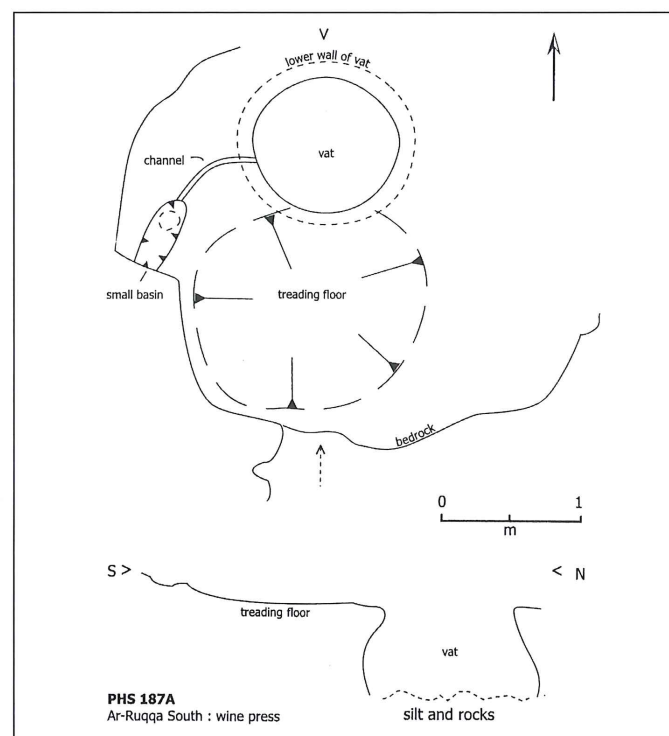
To date, little attention has been paid to these small presses and the mortises themselves have not been reported. Most surveys in the hill country east of the Jordan River have published very general results, concerned more with simple site identification, chronological attributions and broad patterns of settlement. They lack description and functional discussion of sites at the necessary level of detail for comparison (for example, reports on surveys of the Wādī al-‘Arab, Wādī Ziqlāb, Wādī al-Yābis, Wādī az-Zarqā’, the hinterlands of Bayt Rās, Jarash, ‘Ajlūn, ar-Rummān, greater ‘Ammān, as-Salt, Ḥisbān, and areas further south)³. From the sketchy indications in the survey around Tall al-‘Umayri (south of ‘Ammān), none of the rock-cut wine presses correspond to the PHS Type 1 (Geraty *et al.* 1989, sites 23 and 43; Herr *et al.* 1991, sites 59, 66, 74, 76, 81, 83-5, 90, 91, 101, 102 and 105). Similarly, reports on individual discoveries of wine presses in northern Jordan have mostly been limited to large built complexes such as those associated with ecclesiastical or village centres, for example, at al-Yašīla, Ṣa‘ad al-Mafraq, Yājūz, Mount Nebo and Umm ar-Rašāš (Muheisen 1992: 534; Sari 1995: 533; Khalil 1998 pers.com.; Alliata *et al.* 1996: 393-4; Abela and Pappalardo 1998: 543-5). A wine press is mentioned at Abila

but not described (Mare 2001: 501). Discussions of wine presses found in the similar limestone hill country west of the Jordan River where some surveying has been undertaken do not record this type. The simplest type of wine press from this area corresponds most closely to the PHS Type 3 (“Type 1” in both Åhlström 1978: 20; and Dar 1986: 147). Hirschfeld’s ubiquitous “Type 1”, from the area of ancient Emmaus, west of Jerusalem, is a generic description of a rock-cut treading floor and receiving vat, without further elaboration or illustration (Hirschfeld 1983: 207-8). It might incorporate the Pella Type 1, but more information is required.

Thus our Type 1 is either a very regional form, or, being small in size, heavily silted and difficult to see unless walked over, it has escaped notice. Melhem has briefly published some examples from the north Jordan region: from the environs of Dayr Abū Sa‘id, just north east of the Pella hinterland survey area and from al-Ḥuṣn, south of Irbid (Melhem 1995: Figs. 8, 9, 13).

Type 2

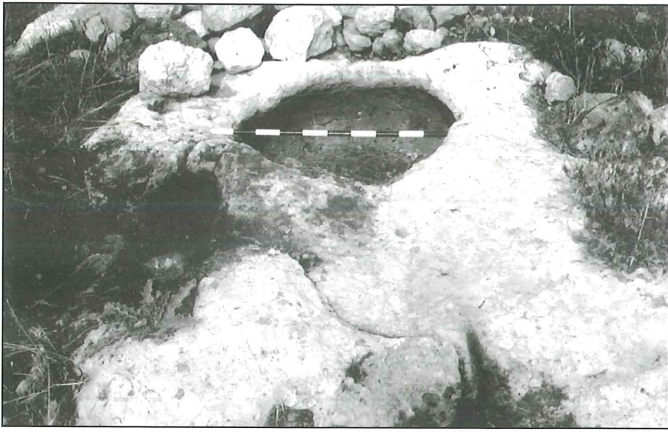
This is of similar size to Type 1, but the treading area consists of mostly uncut bedrock forming a shallow, naturally concave basin sloping towards a rock-cut oval vat. An enclosed channel, one or more open channels, or a simple wide drop (FIGS. 12 and 13) connects them. The five ex-



12. Plan of Site 187A, wine press of Type 2.

³ A full list of references to these surveys would be very lengthy. Reference to useful summaries of this survey information can be found

in Graf 2001: 470-472 and Watson 2001: 466-467.



13. Site 187A, ar-Ruqqa south, wine press of Type 2. View north.

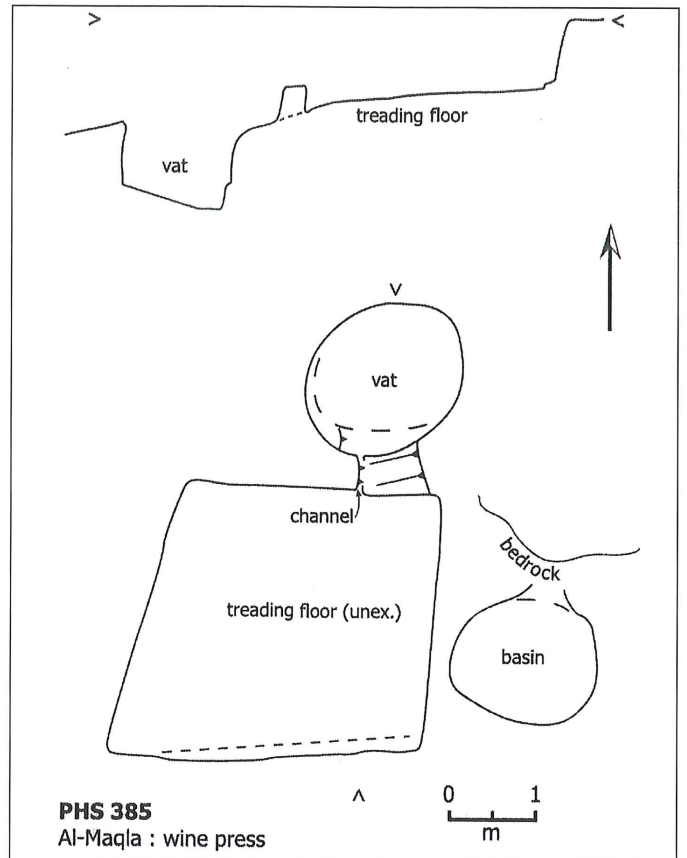
amples found are close in nature to Type 1 and the distinction may merely reflect a labour-saving measure through the opportunistic use of natural form in the bedrock for the treading floor.

Site 192 has multiple open channels from two sides of a semi-encircling treading floor of naturally dish-shaped bedrock, feeding into a hewn circular vat. A similar example is found at al-'Umayrī Site 101 (Herr *et al.* 1991: 306-7).

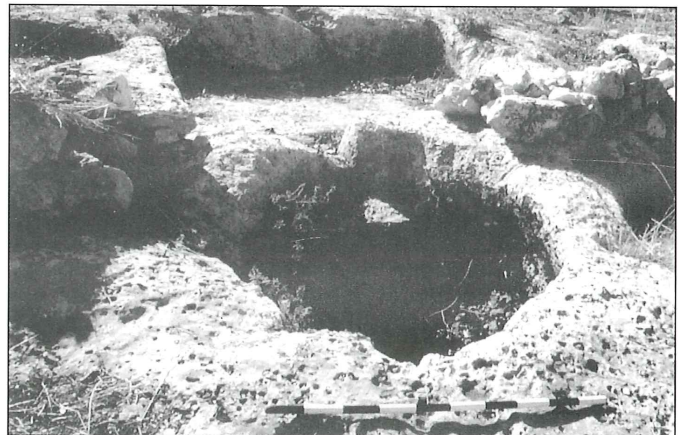
Type 3

The treading floor is larger and roughly square shaped (3-4m²), sometimes tessellated with relatively large white mosaic cubes, and has an open-cut channel to an oval vat. Cupholes and holding basins may be associated (FIGS. 14-16). Sites 44 and 58 reveal remnants of mosaic treading floors; both were silted and not cleared except for probes to determine depth. No vat was visible in the collium around Site 58, which also contained the tumble of two large quarried stone blocks. The attribution as a wine press is therefore tentative. The channel from the treading floor in Site 179 leads into a small basin before dropping into the deeper vat. This would have functioned as a settling basin to collect the sediment from the juice as it passed through to the vat.

This type is comparable to Åhlström's and Dar's Type 1 (Åhlström 1978: 20ff; Dar 1986: 147ff.), although the examples from the hills west of the Jordan Valley commonly have a square vat. A large example from Bayt 'Ayin, south west of Jerusalem, has a plastered receiving vat and an additional separate vat in a cave, accessible by steps, possibly for initial fermentation before decanting into jars (Barukh 1996: 90f., Fig. 95). In the eastern hills, the 'Umayrī Sites 59 and 74 with apparently square vats, seem to belong to this type (Herr *et al.* 1991: 271, Fig.12.9; 282, Figs. 12.33a, 12.36) and possibly site 23 (no scale), (Geraty *et al.* 1989: 136, Fig. 8.48). It is probable that some of the presses mentioned in passing from a



14. Plan of Site 385, wine press of Type 3.



15. Site 385, al-Maqla (Maqla'), wine press of Type 3. View south showing the vat in front of the treading floor, connected by an open channel.

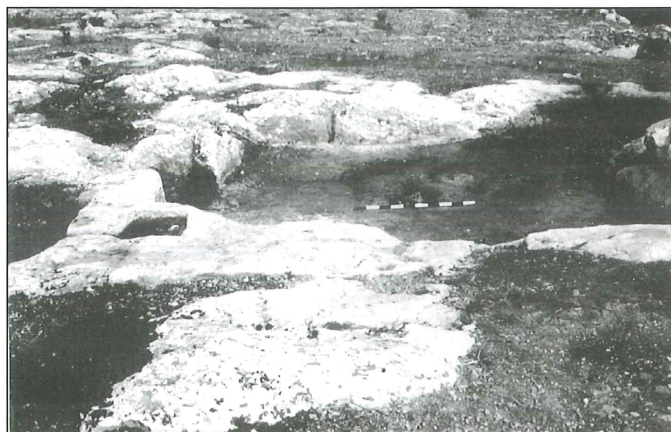
report on an early survey of the hinterland of 'Ajlūn (relatively close to the Pella region) correspond to this type, but the information is cursory (Augustinovic and Bagatti 1952: 243, Fig. 9, 267-9, 273, 290 (a round treading floor?), 306-7).

Type 4

This type reflects greater production capacity and com-

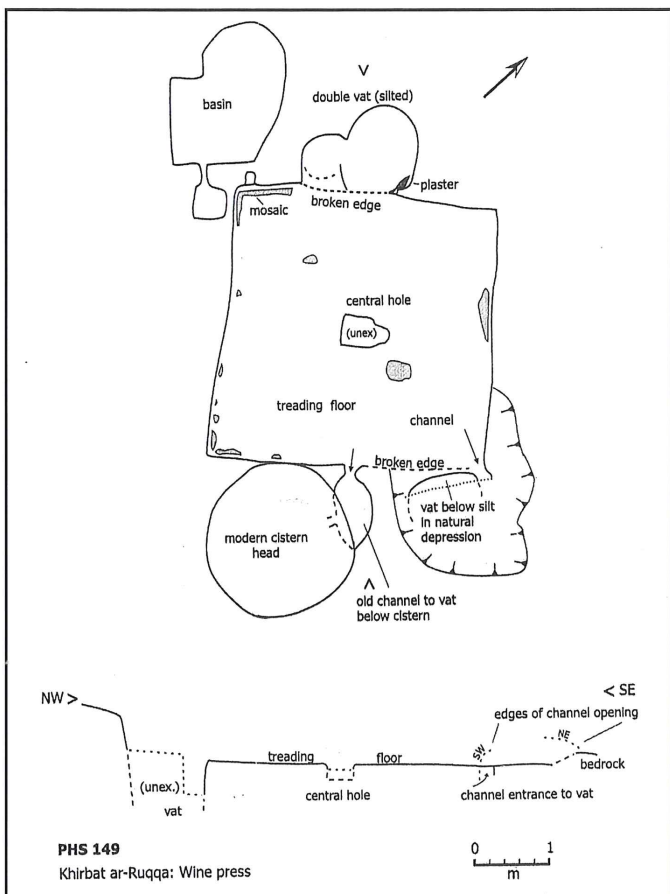


16. Site 179, Umm al-Khanāzir, wine press of Type 3. View south east, showing silted vat in foreground, small settling basin in front of the metre scale, and square treading floor beyond.

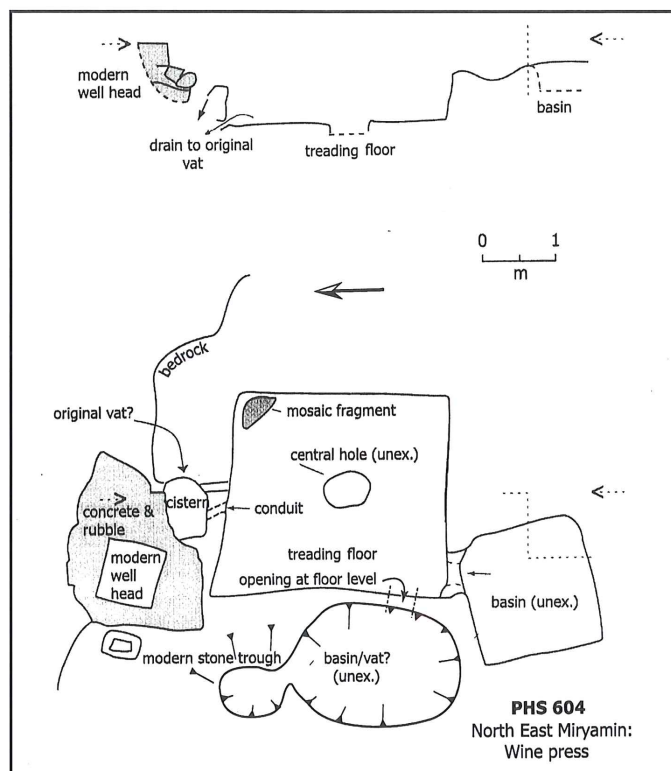


18. Site 149, Khirbat ar-Ruqqa, wine press of Type 4. View northeast, showing treading floor with central socket beyond the metre scale. The modern cistern head is on the right and the holding basin/vat to the left.

plexity. It is composed of a large square treading floor (3x3m or more) with multiple receiving vats, channels and holding basins (FIGS. 17-21). The treading floor is tessellated, with a central hole or socket for receiving the upright pole of a wooden screw press. The screw press is a more sophisticated method of dealing with the second



17. Plan of Site 149, wine press of Type 4.



19. Plan of Site 604, wine press of Type 4.

pressing mentioned above under Type 1 (Forbes 1965: 142-44; Hirschfeld 1983: 214-18; Roll and Ayalon 1981: 121-22 and reconstruction Fig. 7). Good representations of this installation are depicted in the 6th century mosaics from Khirbat al-Mukhayyat, the town of Nebo (FIG. 22) (Saller and Bagatti 1949: pls.18:2, 24:1; Piccirillo 1993: Fig. 207). A wooden cylinder mounted on a vertical threaded pole is screwed down onto the grape residues piled in layers on mats. The workers are shown performing the first stage of production, treading the grapes



20. Site 604, northeast Miryāmin, wine press of Type 4. View north, showing treading basin, unexcavated holding basins to the southwest and west, and the modern cistern head and trough beyond.



21. Detail of Site 604. View south, showing treading floor with central hole (unexcavated) and silt from the break in the wall to the western basin at the right end of the ranging pole. The top of the rock wall above the conduit between the southwest holding basin and the treading floor is broken.



22. Detail of the sixth century mosaic floor in the nave of the Church of Saints Lot and Procopius at Khirbat al-Mukhayyat, showing labourers treading grapes around a wooden screw press.

on the floor around the press and holding hands for support.

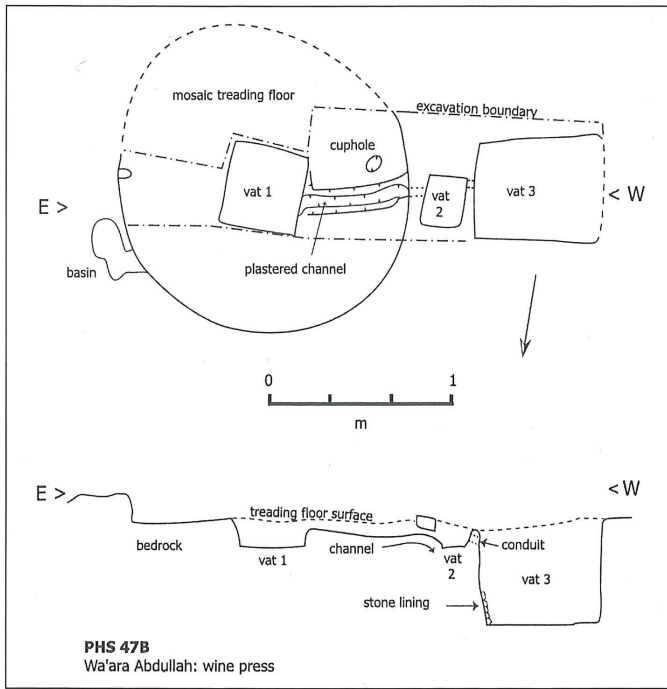
Site 149 at Khirbat ar-Ruqqa could not be fully excavated to clarify the complete system of channelling (FIGS. 17 and 18). It has a plastered double vat on the northwest side. The dividing wall to the treading floor appears to be broken and eroded, removing evidence for channels. Possibly the smaller basin was a settling basin between the treading floor and the vat, as has been observed above in Type 3. Two more vats are evident on the southeast side, with open channels leading to them from the treading floor. What was probably the main vat has been turned into a cistern in modern times, obscuring its original form, which appears to have included a small settling basin. Multiple vats allow for processing of more than one group of grapes at once, potentially from more than one producer. Channels can be closed off, and while the juice is being retrieved from one vat, treading or pressing can proceed using another vat. A separate basin on the western corner has a channel to a small deep vat. Presumably this is a holding basin for grapes with the facility to collect the juice produced naturally by static pressure.

Site 604 at Miryāmin has a large holding basin to the south which channels into the treading floor (FIGS. 19-21). An enclosed channel on the north side and a higher open channel lead to a vat, which has subsequently been converted to a cistern. An associated well head has been built to one side in modern times and is still in use. West of the treading floor is an apparent double basin or vat, which was not excavated. It is unclear whether this originally connected to the main floor, as a natural break at the base of the rock wall between them now provides an opening; this may have developed from an initial rock-cut channel. The silt emerging from this opening is visible on the right side of the treading floor in the photo (FIG. 21). Whether this was a higher basin or a deeper vat would have to be established through excavation.

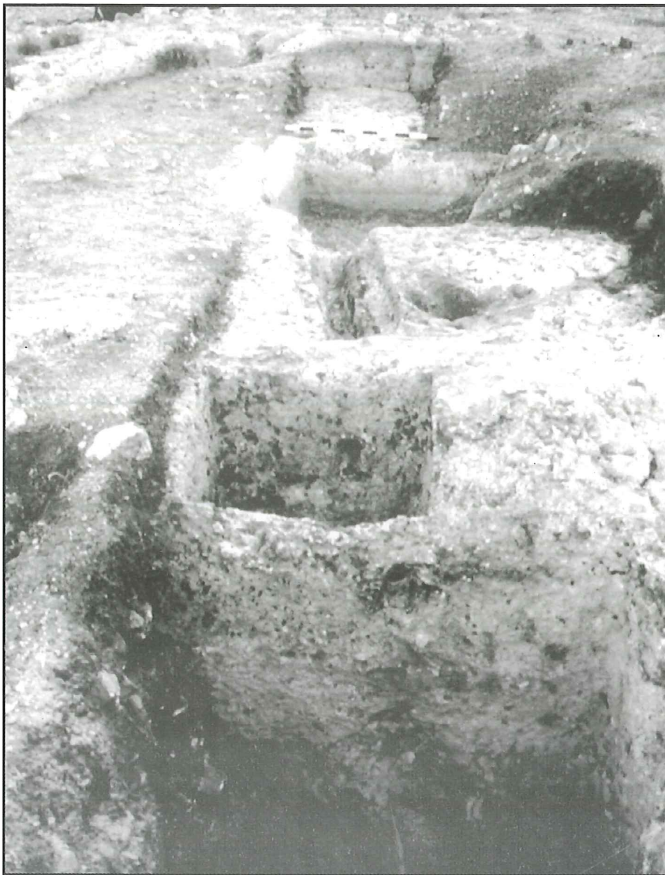
Type 4 corresponds partially with Åhlström's Types 2 and 3 (Åhlström 1978: 20-27, Figs. 11-14), Hirschfeld's Type 4 (Hirschfeld 1983: 211-13) and Dar's Type 3 (Dar 1986: 148f., pl. 24), but the combination of elements varies. An example from Tefahot in the western Galilee has a plain rock treading floor with a socket for a screw press, and two receiving vats (Stepansky 1996: 123f., Fig. 131).

Type 5

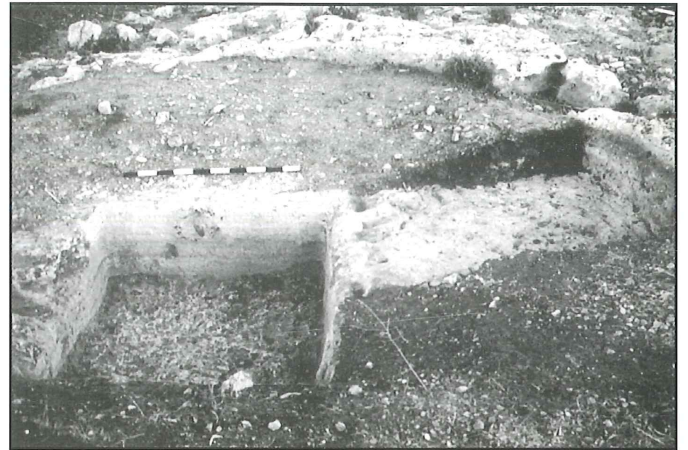
This is represented by a single example at Wa'aara Abdullah, Site 47B, and is associated with a farmstead structure and related features (cisterns, field walls) nearby (FIGS. 23-26). The installation has a large (ca. 5m diameter) circular treading floor with mosaic surface containing a central square vat (1.30 x 1.30m x 46cm deep). An open plastered channel with a ledge on either side, presumably for a removable cover to aid in cleaning, leads



23. Plan of Site 47B, wine press of Type 5. Only those features exposed in a strip trench across the centre are visible.



24. Site 47B, Wa'arat 'Abdullah, wine press of Type 5. View east, with vat 3 in the foreground.



25. Site 47B. View north showing central vat and excavated strip of treading floor.



26. View west from Byzantine farmstead 47A over the lower foothills to the Jordan valley running north-south, and the Esdraelon Valley running west-northwest to the Mediterranean. Note the typical limestone and open oak forest of these higher foothills.

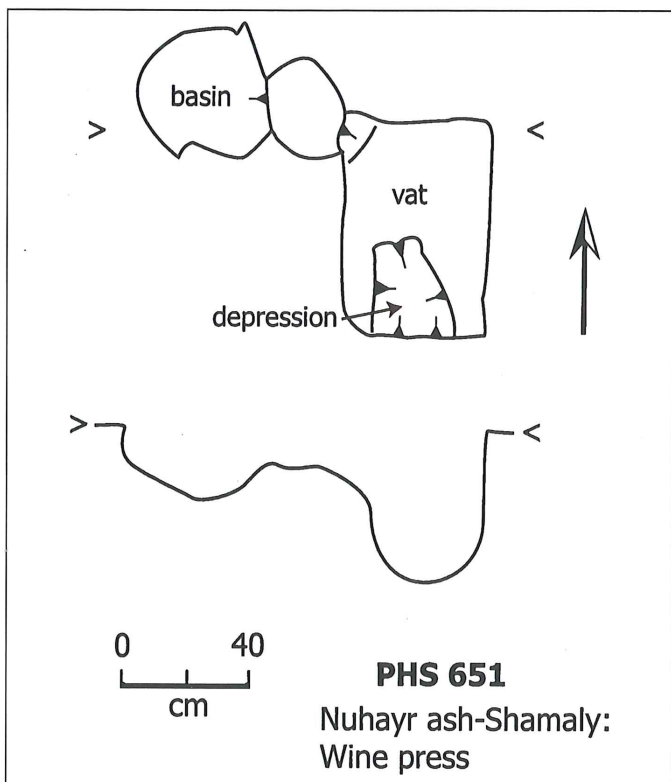
from the central vat to a conduit through the wall of the treading floor. This feeds into a smaller square settling vat outside, which in turn feeds into a large square vat (2.00 x 1.50m x 1.50m deep). The lower reaches of the large vat, where the bedrock was less uniform, are lined with stone carrying traces of plaster. Neither of the outside vats was visible from the surface. They were revealed during excavation of a strip trench laid across the centre of the installation. This is a salutary reminder that many features in these wine presses, especially extra basins and cup-holes, may not have been identified in the survey. A small holding basin is visible on the eastern side of the treading floor. Nearby, a damaged recess in the floor against the eastern wall may be the remains of a socket for a beam press operation that pressed the residue over the central vat. Alternatively a central screw press may have fitted over this vat, but the standard fixtures are not evident.

The central vat and exit channel compare to the example described by Dar from Khirbat Brāq as Type 3, but

other features differ (Dar 1986: 148, pl. 24). Hirschfeld's Type 2 has a more prominent and undisputed beam socket with a smaller central vat that has no exit channel. It isn't clear whether the smaller of the two external vats functions as a settling basin or not. Other features such as a square treading floor of unlined rock are dissimilar to the PHS type (Hirschfeld 1983: 207-9, Fig. 2). The wine press at a Byzantine estate near Caesarea has a circular treading floor of similar dimensions to Site 47B, with a mosaic surface and an external settling vat leading to a main vat. However a standard socket for a screw press rather than a central vat occupies the centre of the floor. The excavators considered the circular treading floor an unprecedented form (Hirschfeld and Birger-Calderon 1991: 107-109).

Type 6

This is a very small rock-cut feature, presumably for hand or mortar pressing. Site 651 comprises an oval pressing basin (44 x 40cm x 20cm deep) and a rectangular vat (50 x 70cm x 46cm deep), connected by a short wide open channel (FIG. 27). An eroded depression in the floor of the vat may originally have served to collect the lees. Similar installations are recorded elsewhere (Åhlström 1978: 39-40, Figs. 32-35). Numerous basins and cupholes, some interlinked, were found in the bedrock exposures throughout the hills. Many of these appeared to be due to natural weathering, but some were uncertain. We erred on the



27. Plan of Site 651, small hand wine press of Type 6.

side of caution in assigning these to human activity (see fn. 1). They could have provided an immediate source of juice to quench the thirst of field labourers working under a hot summer sun.

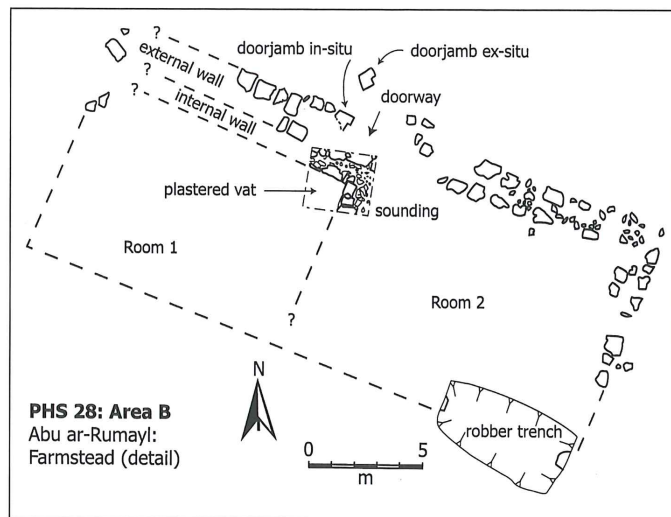
Type 7

It is well attested that ancient wine presses were also built within structures, especially where good bedrock was not available. Some of these were quite elaborate, being associated with major production centres such as farming estates or Christian monastic establishments (Hamilton 1935; Dar 1986: 149, Type 5; Hirschfeld and Birger-Calderon 1991: 95-97). Ecclesiastical complexes excavated in Jordan at Mount Nebo, Umm ar-Raṣāṣ, Yājūz and Ṣa'ad al-Mafraq provide variations of this type (referred to in the discussion of pole mortises above). Wine production was a familiar ecclesiastical activity as wine was integral to liturgical practices.

Soundings at the Byzantine farmstead Site 28 just to the north of Pella, have uncovered part of a possible built pressing installation, but it would require further excavation to confirm its nature and extent. The structural remains proved to be substantial and deeply buried. One room contains a sunken plastered vat more than 171cm deep. Although the floor could not be reached it was almost certainly tessellated, from the number of mosaic cubes in the fill. The sounding was too small to expose the dimensions of the vat (FIGS. 28-30) Watson and O'Hea 1996: 75-6).

Settlement Associations and Chronology

Pella was a prominent Hellenised urban centre during the Hellenistic through Byzantine periods, part of the regional league of similar cities known historically as the Deca-



28. Plan of part of Byzantine farmstead Site 28, Abū ar-Rumayl, showing two rooms visible on the surface and sounding 28B with built plastered vat, part of a potential wine press complex of Type 7.



29. Byzantine farmstead Site 28, sounding A showing depth of wall.



30. View of farmstead Site 28 in the foreground, looking west over the terra rossa *tabaqat* to the Jordan Valley and the opening into the Esdraelon Valley.

polis. Evidence of Roman and Byzantine farming activities, related structures and land organisation is ubiquitous in the surveyed area, in the form of villages, farmstead remains, associated features such as cisterns, water channels and field walls, and abundant pottery distributed throughout the landscape. While difficult to date on their own, the rock-cut wine presses are situated within this milieu, occasionally in conjunction with dateable farmsteads or villages, with some using identifiable technology of the period. It is possible that some of the simple presses were hewn in earlier times, but we have no artefactual evidence or patterns of land use to suggest this.

Dating of sites is primarily reliant on the surface pottery collected in the survey, and occasionally from excavated soundings at selected sites. The problems inherent in this procedure (expressed by Graf 2001: 472) are minimized to some degree by the fact that the ceramic typology for this region has been intensively studied and re-

fined. Prolonged excavations at the focal site of Pella, encompassing virtually all periods of occupation has produced vast amounts of stratified pottery for analysis (McNicoll *et al.* 1982 and 1992; Smith 1973; Smith and Day 1989; Watson 1992b; Walmsley 1995). The table presented in TABLE 2 categorises the relevant settlement sites in the survey area as farmstead, fortified farmstead or small fort (where definition is uncertain), villa (more elaborate remains) or multi-period *tall* (hamlet or village). The dating range for these sites and the dominant pottery presence are listed. Some sites such as 112 and 143 may have begun as small forts in the early Roman period and were converted to farmsteads in the Byzantine period. It is difficult to confirm this functional distinction at survey level, but Roman Site 73 by construction, layout and location, seems more fort-like, and was not reused in the Byzantine period, whereas Site 143 has clearly been reorganised in its later phase. Both sites overlook an ancient route between the northeastern uplands and Pella. Site 216 (Khus Mismār) on a knoll on the northwest flank of Jabal Sarṭaba overlooking Pella, is certainly a fort which functioned purely in the Roman-period. Site 502 at Khirbat Nahlah, isolated strategically on the Roman road to Jarash, has Iron Age followed by Roman occupation and may have performed a similar function. The inference for settlement patterns is that the early Roman period (mid-first century BC – second century AD) was less secure, probably less populous, and required defensible / observatory outposts at strategic locations approaching Pella. Apart from the structure excavated on Tall al-Ḥuṣn at Pella (Watson 1993), there are no forts in the hinterland dating to the Byzantine period.

Farmstead 28 incorporating a possible wine press and farmstead 47 definitely associated with a wine press are two late Byzantine sites (sixth – mid-seventh centuries) which do not continue into the eighth century. Rubbish survival of Roman pottery at Site 28 suggests it had an earlier foundation. Other Roman and Byzantine farmsteads 112, 133A-B, 143, 391 and 683 have Type 1 presses within 500m. Farmsteads 54, 450 and 458 are more distant from the nearest presses, but still within walking distance (the latter two sites may have closer wine presses to the east, beyond our survey area). Possible farmsteads/villas at 692 (very vandalised), 704, and 90 (perhaps associated with the functioning of the bathhouse at the adjacent hot springs) are distant from presses.

Farmstead 196 presides over an olive press but also encompasses, on the tiered rocky pinnacle of aṭ-Ṭaṭṭūr, a badly destroyed mosaic floor in a rock-cut area arranged on different levels above an elevated plastered cistern. The oil press is on a tier below this. There is not enough evidence to classify this collection of features as a wine pressing installation, and the location, requiring strenuous access, would add to the difficulties of production. It is

TABLE 2. Table of settlement sites in the Pella hinterland.

Pella Hinterland Survey: Table of Farmsteads / Villas / Tells

Site No.	Type	Name	Coordinates (UTM)	Periods represented in survey pottery
28	F	Abu ar-Rumayl	45886/94344	Rom, <u>Byz</u>
47	F	Wa'ara Abdullah	47708/94248	L. <u>Byz</u>
54	F	Tha'ar as-Satch	48094/94518	Hell/Rom, Byz
73	FF	Al-Qasabat	47712/95212	E.Rom, L.Rom.
90	V	Hammamat Abu Dhabla	46332/95172	Byz
112	F	Al-Mundassa	46640/95816	<u>E.Rom, L.Rom, Byz.</u>
133A	F	Al-Baq'a	48396/95224	Rom, Byz, <u>Med</u>
133B	F	Al-Baq'a	48422/95194	Rom, Byz
143	F	Tall as-Serj	48804/95252	<u>E.Rom, L.Rom, Byz</u>
167	T	Dayr al-'Asal	49464/94270	Hell/Rom, Byz, <u>Med, Ott</u>
171	T	Hodh al-Bayadh	49800/96500	BA, IA, Rom-Byz
176	T	Dayr Qiqub	49360/96084	<u>BA, IA, Rom, Byz, Um, Ott</u>
184	T FF?	Ar-Ruqqa	49482/94808	<u>BA, IA, E.Rom, L.Rom, Byz</u>
196	F	Tantur	47850/93270	IA, Hell, <u>E.Rom, L.Rom, Byz</u>
391	F	Al-Subarr	48300/92930	E.Rom, L.Rom, L. <u>Byz, Um</u>
450	F	'Urqub ash-Shmaly	49733/93402	Rom-Byz, Um
458	F	'Urqub ash-Shmaly	49933/93335	E.Rom, L.Rom, Byz
500	T	Khirbat al-Kharjeh	50000/92403	Hell, Rom, <u>Byz, Um, Ab</u>
502	T	Khirbat Nahleh	46233/91366	IA, Rom
618	T	Khirbat Miryamin	47930/90822	BA, IA, Hell, Rom, <u>Byz, E.Um</u>
683	V	Al-Khawwan	44403/94000	Rom, <u>Byz</u>
692	F?	Wadi al-Hammeh	44615/95633	Hell, Rom
704A	F	Sayl al-Hammeh	44465/95986	BA, <u>Hell, Rom</u>
704B	F?	Sayl al-Hammeh	44476/95987	<u>BA, Hell, Rom</u>

Key:

BA	Bronze Age	IA	Iron Age	Hell	Hellenistic
E.Rom	Early Roman	L.Rom	Late Roman	Byz	Byzantine
L.Byz	Late Byzantine	Um	Umayyad	Ab	Abbasid
Med	Mediaeval	Ott	Ottoman	<u>Byz</u>	dominant presence
../..	more general identity				

F farmstead
V villa

FF fortified farmstead or small fort
T multi-period tell (hamlet, village)

not therefore included in the inventory of wine presses. Situated at the bifurcation of the Wādī Malāwī, leading directly west to Pella, the pinnacle of aṭ-Ṭanṭūr is littered with archaeological remains from many periods. It played an important strategic role going back to the Middle Bronze Age. Farmstead 196 on the eastern side was clearly an agricultural complex of some note for many centuries.

Advanced beam and screw press technologies and the use of mosaic surfaces places Types 3-5 and 7 in the Graeco-Roman period (Forbes 1965: 140-144; Hirschfeld 1983: 211; Dar 1986: 150). Satellite hamlets and small villages in the area sometimes have a lengthy chronology but always include a Roman and/or Byzantine presence (Dayr al-ʿAsal Site 167, Ḥawḍ al-Bayād Site 171, Dayr Qiqūb Site 176, ar-Ruqqa Site 184, Khirbat al-Khārjah Site 500, Khirbat Nahlah Site 502, and Khirbat Miryāmin Site 618). Khirbat ar-Ruqqa is a modern village that could not be closely surveyed. Wine presses, cisterns, field walls, basin and cuphole sites and general pottery scatter of the Roman-Byzantine period surround it. It is possible there was a hamlet here but this is an assumption. While Koucky reported Mamluke and later pottery at the village, his survey was cursory, identifying in addition only the small *tall* of Site 184 in this area (Koucky 1992: 201, Sites 37 and 32). Mittmann does not mention the Khirbat in his survey of northern Jordan, but did record Sites 184 and 143 (Mittmann 1970: 47-8, sites 108 and 109 respectively). Neither surveyor noted any wine presses, an indication that intensive survey is required to identify features of this scale and obscurity in the landscape.

Most of the farmsteads do not continue into the Umayyad period (650-750 AD). Identification of late seventh century pottery is too imprecise without a comprehensive corpus to analyze, to be sure whether this abandonment closely coincided with political change. However no diagnostic eighth century pottery was present on the majority of sites⁴. Two farmsteads only were identified with early eighth century pottery, Sites 391 and 450. The former is a medium-sized site (1575m²) while the latter is small (418m²).

Comparative data from the hilly areas of Jordan and Palestine/Israel support a similar dating range for the wine presses. The references cited throughout have consistently dated the wine presses to the Roman and/or the Byzantine period (the latter predominates) where evidence is available. Some examples testify to abandonment or functional reuse in the eighth century, such as Umm ar-Raṣāṣ (Abela and Pappalardo 1998: 544), Khirbat Maṣṣūr al-ʿAqāb (Hirschfeld and Birger-Calderon 1991: 86-7), Rehovot and Khirbat ʿAzzun (Roll and Ayalon 1981: 115, 118). The area around Bayt Rās and Gadara, two neighbouring

Decapolis cities north east of Pella, was famous for its wine in the sixth and early seventh centuries. Pre-Islamic poetry of the Jahiliyya extolled its virtues and rock-cut wine presses have been reported in the vicinity. Whether this was the same Bayt Rās named in connection with wine in the Abbasid period is more doubtful (Lenzen and Knauf 1987: 35-42; Melhem 1995: 33-34).

The Nature of the Wine Industry Around Pella

Wine presses of Types 1 and 2 predominate in the landscape. These were small installations, sometimes found in close proximity to each other. The capacity of a single vat ranges between 92 and 1,720 litres, representing a relatively small level of production (compare the discussion of production levels in Dar 1986: 148-9). They are scattered across the hills, not necessarily adjacent to farm structures. It was preferable to process the grapes close to their source, in order to minimize transport logistics and potential damage to the fragile ripe fruit, and this is reflected in the location of the presses. The grapes may have been grown along the ground in the pockets of rich soil and draped over the abundant rocks, as can be seen in the area today (where grapes are grown in a small way for raisins and fruit). This method had several advantages over trellising for the small producer; it was less labour-intensive and was considered to produce the best wine (Pliny *Natural History* 14: 10-15; Forbes 1965: 114). Such processing represents small-scale production from individual or family plots, for private or local use.

There is a well-distributed scatter of the four Type 3 presses, one representing a marginally increased output, possibly a of larger holding. The three more sophisticated installations of Types 4 and 5 cater for a higher level of production involving multiple loads. These wine presses could conceivably be used by numerous landholders on a cooperative basis (Site 604 is adjacent to the village at Khirbat Miryāmin and Site 149 is adjacent to Khirbat ar-Ruqqa), or by a larger holding like an estate. However, none of the farmsteads are remotely equivalent to the large Roman and Byzantine estates recorded west of the rift valley, such as Maṣṣūr al-ʿAqāb, (Hirschfeld and Birger-Calderon 1991) and Shelomi (Dauphin 1977). Not enough has been excavated of the Abū ar-Rumayl farmstead Site 28 to reveal its true nature, although the remains are relatively substantial. The site contains a number of large cisterns and moveable large stone basins. It overlooks the rich terra rossa plateau (the *tabaqat*) above the valley floor just north of Pella, with a spectacular view of the Jordan Valley and westwards down the Esdraelon Valley (FIG. 30). The so-called “villa” Site 683 at al-Khawwan (noted for its size – 6000m² - and more elaborate features such as columns, marble and mosaics) is on

⁴ For a discussion of seventh century pottery in the region of Pella, see

Watson 1992b and Walmsley 1995.

the western edge of the tabaqat itself, with a similar outlook. In these cases location seems more for aesthetics and proximity to productive land than defence. Unfortunately the site at al-Khawwan has been so damaged by recent trenching activities that it is impossible to delineate the ground plan. One small wine press (679) is nearby on a low rocky knoll, but this area is below the altitude favoured for grape growing.

The presence of these substantial farmsteads or villas with a strong late Byzantine presence (this would include Sites 90, 112 and 184 if the latter is not a hamlet) reveals a level of rural affluence in the sixth and early seventh centuries, just prior to their demise. They existed in conjunction with medium-sized farmsteads such as Sites 143, 196, and 391, and smaller farmsteads such as Sites 54, 133, 450, 458 and possibly 692, suggesting a healthy range of wealth distribution at various socio-economic levels. The feudal dominance of large estates did not seem to operate in this area, and the decentralised and small-scale nature of the wine presses implies a level of individual autonomy in land ownership and control of production. This is set within a network of small villages within a radius of 3-4km from the urban hub of Pella, presumably accommodating farm owners and labourers.

There may well be a chronological distinction between the simple and more complex pressing types, reflecting a growing level of production and sophistication in the wine industry around Pella from the Roman into the Byzantine period. However there is no evidence to justify this nuance of development at present and the case for a functional difference in requirements remains the stronger. In the wider context of wine production in the Levant, the Pella industry was small and localized. There are no historical references to wine from Pella and until the survey discovered the presses, the existence of this industry in the area was unrecognised.

Changes in Land Use and Demography in the Seventh Century AD

The decline in the number of active farmstead and villas between the early seventh century and the eighth century, from a maximum of thirteen sites to two sites, suggests a significant change in patterns of landuse during this time. Half of the Byzantine villages, some of which had existed for centuries, were abandoned. Sites 176, 500 and 618 continued to be occupied, although the latter appears to be limited to the seventh century. The countryside was apparently depopulating. At the same time, the urban structure of Pella was undergoing reorganisation. There is evidence that houses and shops of the Byzantine period were converted in the early seventh century to complexes that incorporated animal stables within the living areas (Watson 1992a: 168-170 Phase V; Watson 1993: 204, fn. 86; Walmsley 1992a: 183-6). This accommodation of rural

structures and activities within the urban confines intensified in the second half of the seventh to mid-eighth centuries (McNicoll *et al.* 1982: 132-139) and must have been facilitated by a thinning of the town's population.

The earthquake of AD 659/660 had a profound effect on the town; destroyed buildings were abandoned or only partially rebuilt, churches were impoverished, street patterns were altered and the settlement on Tall al-Huṣn ceased (Watson 1986 and 1993: 203-4; Walmsley 1992b: 254-255). This may well have been the catalyst for abandonment of the farmsteads and villages leading to a relocation of the remaining farming families into the town, from where they traveled out to their pastures and agricultural lands. Earthquakes are endemic in this part of the world, and it is symptomatic of the strength of the economy and the political will at the time, whether they become hiccups in the larger scheme of things, or whether they exacerbate weaknesses and generate change. The inhabitants of Pella and its busily settled catchment area were unable to recover their former patterns of life, whether due to religious or economic marginalisation, natural disaster, or a combination of these factors. The material remains of the eighth century late Umayyad period at Pella, remarkably preserved for us by the earthquake destruction of 749 AD, indicate a prosperous community, but essentially rural rather than urban in nature (*idem*; Walmsley 1988). The population was modest and, according to the survey data, much reduced throughout the immediate countryside.

The Wine Industry as an Expression of Cultural Identity

From the preceding discussions we can conclude that the wine industry was probably introduced into the Pella region during the Roman period around the beginning of the first millennium, when the first farmsteads were established. Wine consumption was very much a part of the ascendant Graeco-Roman culture, and the accompanying pressing technology derived from this tradition. The industry developed and flourished throughout the Byzantine period (fourth – early seventh centuries), a time of relative security and prosperity, when activity in the landscape was at its height, and the population of Pella reached its greatest extent.

During the Byzantine period the consumption of wine was promoted and supported by the Christian church, as witnessed in its liturgies, its artistic representations in mosaic floors, and in the pressing installations commonly associated with ecclesiastical establishments. It can be seen as a cultural phenomenon of this period. In the Pella hinterland, it is reasonable to equate the multiplicity of wine presses with the frequency of farmsteads and hamlets, some of which supported these installations. It is equally reasonable to assume that the abandonment of these farm-

steads may also be associated with the decline of an industry that at least partly sustained them. Other factors would, of course, have been involved. Depopulation may have encouraged movement into the urban centre of Pella that was less densely populated in the seventh century than the preceding century. The partaking of wine was condemned by the incoming Islamic power, and the influence of prevailing religious morés probably affected this sector of the agricultural industry. There was no destructive takeover after the Battle of Fahl in 635 AD, nor were there subsequent forced conversions to Islam. Christian life continued at Pella although the nature of the town was changing. The churches continued to be used but their progressive deterioration surely mirrors the status of their congregation. The imposition of a poll tax and land tax on non-Muslims could have contributed to the impoverishment or even emigration of many in this sector of the community (McNicoll *et al.* 1982: 127; 1992: 162-3; Walmsley 1992: 254). The decline in wine production may have been a gradual one, by attrition over a generation or so. The archaeological record indicates that by the eighth century, the wine industry around Pella had ceased, emblematic of a more general cultural shift in society during the later seventh century.

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