

HIPPOS - SUSSITA OF THE DECAPOLIS

**THE FIRST TWELVE
SEASONS OF EXCAVATIONS
2000 - 2011**

Volume II

MICHAEL EISENBERG



THE ZINMAN INSTITUTE OF ARCHAEOLOGY
UNIVERSITY OF HAIFA, MOUNT CARMEL, ISRAEL



Hippos-Sussita of the Decapolis

The First Twelve Seasons of Excavations

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Michael Eisenberg



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*This volume is dedicated to Prof. Arthur Segal
who initiated and headed The Hippos-Sussita Excavation Project
for the first twelve seasons (2000-2011).*



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The Hippos Winery Complex

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Introduction

Hippos became the seat of a bishopric as early as the mid-4th century CE. Judging by at least seven churches that were built at the site, most of which continued to function deep into the Early Islamic Period, Christians were the dominant inhabitants at Hippos until the full abandonment of the city following the 749 CE earthquake.¹ Hence, it is not surprising to find winery installations in a city like Hippos during the Byzantine and Early Islamic periods. The largest and most complex winery at Hippos, which is at the core of this paper, is located on the northern and southern sides of the Northwest Church Complex (NWC) (Figs. 5.1–5.3).²

The Northwest Church (NWC) and its Agricultural Installations

The NWC was erected inside the temenos (Hellenistic Sanctuary) on the foundations of a Roman temple which had formerly stood there (Figs. 5.1–5.3, 5.6–5.7). A courtyard, a few foundation walls and the podium together with a short staircase are the only remains of the temple. Some of the church walls are based on the foundations of the Roman ones, while the courtyard and the staircase are located to the south of the church.³ The temple was dated to the reigns of Augustus or Tiberius (end 1st century BCE to early 1st century CE).⁴ The church or at least part of it was in use until the 749 CE



Fig. 5.1 The Temenos (Hellenistic Compound). Aerial view.

1 For a full historiographical description of Hippos see Dvorjetski, “The Historical Geography of Sussita-Antiochia Hippos-Qal’at el-Husn”, in *Hippos Summary Report I*, p. 40–63; for the urban plan see Segal, “Urban Plan and City Landscape”, in *Hippos Summary Report I*, p. 64–85.

2 The Northwest Church was excavated by Prof. J. Młynarczyk and Dr. M. Burdajewicz. We wish to thank them both for their cooperation in preparing this paper. For the archaeological reports of the northern winery see: Młynarczyk and Burdajewicz, “North-West Church Complex”, in *Hippos 2005*, p. 36–45; Młynarczyk and Burdajewicz, “The Northwest Church Complex”, *Hippos Summary Report I*, p. 194–217. The southern winery complex was mainly excavated by the “Israeli team”, headed by A. Segal and M. Eisenberg (see note 8 for full bibliographical references). See also Skupinska 2007, p. 112–114.

3 For a full discussion of the sanctuary and the temple see Segal, “Hellenistic Sanctuary”, *Hippos Summary Report I*, p. 128–147.

4 Segal, “Hellenistic Sanctuary”, *Hippos Summary Report I*, p. 145–146.



Fig. 5.2 The Temenos. Aerial view towards southwest.

earthquake. The debris and the reliquaries left standing beneath it are evidence for the sudden destruction of the church. From the late Byzantine period until 749 CE the area to the south and north of the church was used for industrial purposes. The narrow space to the south of the church, between the southern church wall (W243) and the southern temenos wall (W156) was transformed to serve as part of this industrial area.⁵ Here, the pavement of the former Roman Period courtyard was covered with a thick layer of gray plaster (Figs. 5.1–5.3, 5.5–5.6). Part of an olive press complex was exposed in situ at the eastern end of the courtyard (Figs. 5.1–5.3, 5.6–5.8). It consisted of a stone base for a screw press with a collecting basin.⁶ The screw press is of a type which is typical of the region (Frankel 1999: Type T 732, Map 31). The press was probably a single rotating screw press (Frankel 1999: Model 7A1, fig.24) but

may have been a press with two fixed screws (Frankel 1999: Model 7B, fig.26), a type used both in Upper Galilee and in the Golan in recent times (Frankel et al 1994: fig. 123 esp. B and D).⁷

The Winery Complex

Nine installations were uncovered, all of which are situated around and integrally connected with the NWC (Figs. 5.1–5.4, 5.7).⁸ Three of the installations are large, one to the northeast (NE) of the church, another to the southeast (SE) and the third to the southwest (SW) (Figs. 5.1–5.4, 5.7, 5.12). These are of the usual type of wine press consisting of three main elements: a treading floor, a collecting vat and a screw mortice in the centre of the treading floor. The other six installations are situated together to the west of the SW wine-press

5 As early as the beginning of the 8th century CE Hippos became more of an industrial town than a city. Some parts of the city were abandoned and other parts, mainly in the city center, turned into industrial areas. Among these were a large bakery southeast of the temenos, an olive press south of the Cathedral, and large areas of the above-mentioned temenos. See: Eisenberg 2016; Segal, *Hippos Summary Report I*, p. 80–85; Segal, *Hippos 2007*, p. 19–22, figs. 22–26.

6 Młynarczyk and Burdajewicz, “Exploration of The North-West Church Complex”, *Hippos 2002*, p. 25–27, figs. 2, 42.

7 Several publications have dealt recently with the ancient oil and wine industries. See: Avrutis 2015; Ayalon, Frankel and Kloner 2012; Ayalon, Frankel and Kloner 2009; Ayalon 1997; Brun 2005, 2004a, 2004b, 2003; Diler, Şenol and Aydinoglu 2015; Frankel 1999; White 1970.

8 For the excavation reports and summary of the northern installations of the NWC, see Młynarczyk and Burdajewicz, “The Northwest Church Complex”, *Hippos 2006*, p.57, fig. 82; Młynarczyk and Burdajewicz, “The Northwest Church Complex”, *Hippos Summary Report I*, p. 214–215, figs. 277, 294. For the southern installations, see Młynarczyk and Burdajewicz, “Exploration of The North-West Church Complex”, *Hippos 2002*, p. 24–28, figs. 2, 6, 9–10, 42, 46–48; Segal, “The Hellenistic Compound”, *Hippos 2003*, p. 14–15; Segal and Eisenberg, “The Hellenistic Compound”, *Hippos 2004*, p. 20–23, figs. 9–10, 39–49; Segal and Eisenberg, “The Hellenistic Compound”, *Hippos 2005*, p. 23–26, figs. 5–6, 50–52.

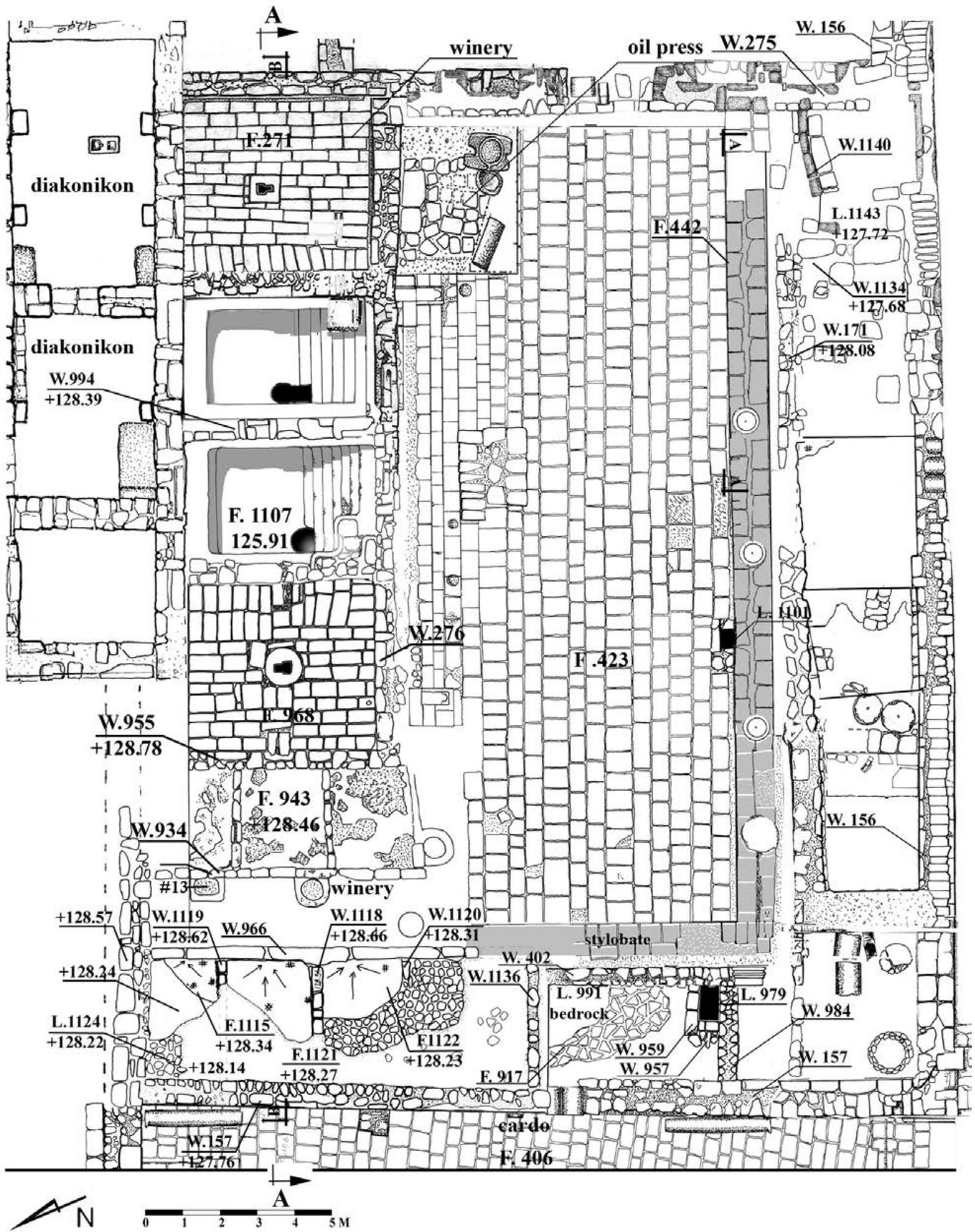


Fig. 5.3 The southern winery. A plan.

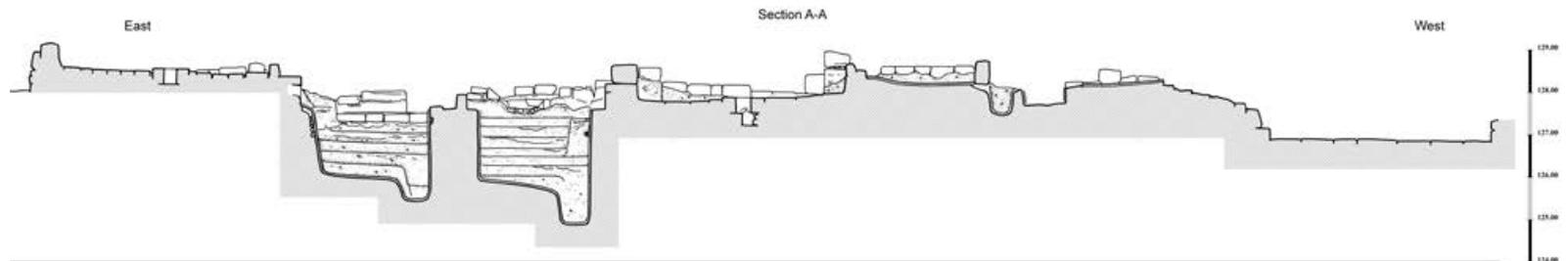


Fig. 5.4 The southern winery. A section.



Fig. 5.5 A fragment of the temple courtyard and the remains of the stairway leading towards the Early Roman temple.



Fig. 5.6 The temple courtyard, photographed from the SE treading floor of the southern winery towards southwest. Note the olive press at the leftmost part of the photograph.

in two groups of three, one to the west of a sunken path and the other to the east of the path (Figs. 5.1–5.4, 5.11). These six are quite different in character from the first three, consisting primarily of a small treading (?) floor. The three installations in the eastern group have in addition a small collecting basin, while the three in the western group lack any fixed collecting installation. These six installations are very unusual, and this is the main justification

for devoting an article to the Hippos installations. In addition, the Hippos winery complex is among the largest and best preserved in the north of Israel.⁹

The Large Wine Presses

The three large wine presses are almost identical in plan (Figs. 5.1–5.4, 5.7, 5.12). The treading floors of all three are almost perfect squares and of identical size, approximately 25 m². The collecting vats are rectangular and all three are approached by steps that extend across the entire width of the narrow side. Their volumes are: NE press 5.7 m³; SE press 6.3 m³ and SW press 3.7 m³ (effective volume *i.e.* up to outlet of intermediate vat, total of all three 15.7 m³). In all three vats there are rounded sumps located at the bottom of the steps adjacent the wall of the vat (Figs. 5.3–5.4, 5.7, 5.9, 5.12–5.14, 5.16–5.17). All the vats were plastered, the vats themselves twice over and the steps five times. It seems that due to the continual erosion of the steps it was necessary to replaster them more frequently (Figs. 5.13–5.19). All the plaster layers are pinkish in color and include ceramic sherds as part of the binding material (Fig. 5.20).

The treading floors are paved with rectangular basalt flagstones, probably in secondary use. The SW treading floor differs from the other two in that the joints between the stones are sealed with lead instead of plaster (Figs. 5.1–5.4, 5.7, 5.21–5.22). The SW and SE wine presses have small intermediate vats that probably served to sieve the must (Figs. 5.7, 5.22–5.24).

In the centre of the northern and southern walls of the SW treading floor there are remains of pilasters, which clearly served to support a roof (Figs. 5.3–5.4, 5.7, 5.17). We presume that the other two treading floors were also roofed in the same manner.

An unusual element found in the two southern wine presses is a small basin that probably served to wash the feet of the workers (Figs. 5.3, 5.7, 5.13–5.14, 5.17, 5.23). Both basins are placed at the southern edge of the wine presses between the treading floors and the collecting vats so that those coming from the southern courtyard and working in either area could use them. In the *Geoponica* (VI:11, translation, White 1970, p. XV) it is specifically stated that “the men that tread must get into the press after having scrupulously cleaned their feet”.

To the west of the SW wine-press there are small plastered auxiliary floors (Figs. 5.3–5.4, 5.7, 5.10–5.11). In each floor there is a small channel that drains to the west away from the main treading floor. A

⁹ We have decided to name all of these wine production installations ‘a winery complex’. although the term ‘wine-press’ is also frequently used in our publications. The single installations used as a press will be named wine-press or a press.

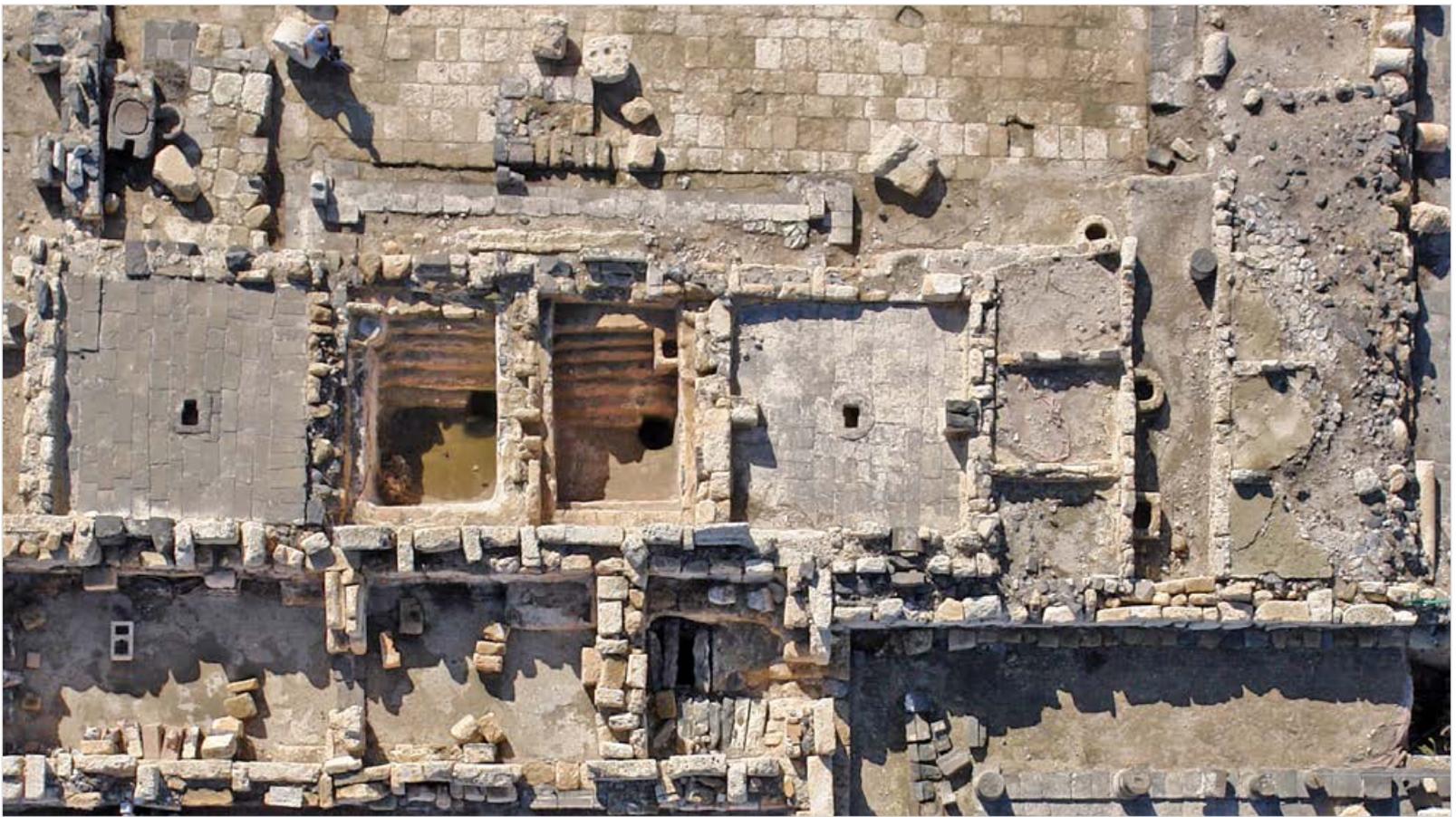


Fig. 5.7 The southern winery complex and the olive press (upper left). Aerial view.



Fig. 5.8 The olive press.



Fig. 5.9 The southern winery photographed from the southeastern treading floor towards west.

wide wall separates the auxiliary floors from the main floor, but at the southern end of this wall there is a plastered opening (Figs. 5.25–5.26). Originally there was probably a similar plastered opening at the other end of the wall for the other floor, but it has not survived. Auxiliary floors are common in complex wine presses, and leaving the grapes in the sun before treading was recommended both by Columella (*Rei Rusticae* XII.27) and by Pliny the Elder (*Naturalis Historia* XIV. 10, 77) in order to produce sweet wine.¹⁰

The grapes were left standing on the auxiliary floors for three days before being transferred through the plastered openings to the

main floor for treading. The small channels in the auxiliary floors were made to collect the first must that flowed from the grapes before treading. The must that flows from the untrodden grapes is called in Latin *mustum lixivium* which Columella (*Rei Rustica* XII. 27) clearly explains as: “the must which flowed into the must-vat before it has been squeezed in the wine-press”. In Greek it is called *prototropum*, which Pliny (*Naturalis Historiae* XIV. 11, 85) explains as: “the liquor called in Greek *prototropum*, the name given by some people to must that flows down of its own accord before the grapes are trodden”. It is of interest that some types of wine called *prototropum* were apparently produced from the

10 Frankel 1999, p. 139; Avshalom-Gorni et al. 2008.



Fig. 5.10 The six installations at the western part of the southern winery.

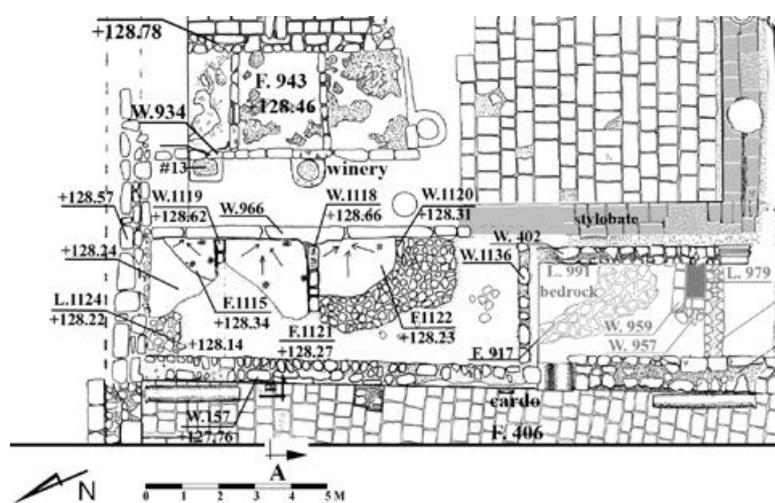


Fig. 5.11 The six installations at western part of the southern winery, a plan.

must of untrodden grapes e.g. “prototropum of Cnidus” (Pliny *ibid* XIV.9, 75); “in the island of Lesbos the Prototropum wine” (Vitruvius, *De Architectura* VIII. 3,12)

North of the northern wall of the SW press a built tomb was re-used as a wine cellar. Several wine jars were found, dated to the Byzantine-Umayyad Period (L295) (Figs. 5.1, 5.3, 5.7, 5.27).¹¹

It was previously suggested that the rectangular hall with a mosaic floor to the west of the NE press (L210W) served as a fermentation

floor (Figs. 5.1–5.3, 5.28).¹² However, the entrance to the hall is from the west and not from the east and there is no direct connection between the wine-press and the hall. The function of this hall is unclear.

Before discussing the screw mortices, we will compare the treading floors and collecting vats to those of other sites. As regards to size, the treading floors are of an average size. Much larger ones have been recorded, reaching an area of 49m².¹³ The treading floors are very similar, both in size and in the way they were paved, using basalt flagstones, to a group of wine presses published from Jebel al-¹Arab east of Suweida about 90 km to the east of Hippos.¹⁴ The volume capacity of the collecting vats (6.3 m³; 5.7m³ and 3.7 m³) are also very similar to those of other wine presses, although these are occasionally much larger.¹⁵ Steps leading down to the collecting vats are very common, but it is unusual for them to be along the whole width of the vat. Similar steps can be found at the site of Khirbet Yajuz in Jordan,¹⁶ where they also extend along the narrow side of the vat. However, in Kh. Yajuz, the narrow side faces the treading floor. The vats of the two southern wine-presses are re-used vaulted chambers remaining from the Roman period which had originally formed the basis for the podium of the Roman temple that once stood here. The steps of the vats were however added later.

The Screw Mortices

All three presses have a mortice for a single fixed screw press, a type of press typical of wine presses in the southern Levant. The rape, the skins and stalks remaining after treading, are piled up around the fixed screw. A hole in the pressing board (or platen) made it possible to slip the board over the screw and lay it on the rape. Turning a nut on top of the board forced it downwards, exerting pressure on the rape.

As opposed to other types of presses such as lever and weights presses, lever and drum presses, lever and screw presses, direct pressure screw presses and wedge presses, all of which are referred to in classical literature by writers such as Cato, Vitruvius, Pliny the Elder and Hero of Alexandria, the single fixed screw wine-press does not appear in classical literature.¹⁷ It is however hinted at in the version of the “Baraita of the Lulabim” mentioned in the Jerusalem Talmud (Y ‘Abod. Zar.5.14, 45b).¹⁸ Representations of this type of press also appear on mosaic pavements in the southern Levant. Three of them are from Jordan and one from Lebanon.¹⁹ Both the screw mortice and the press bed in which it is cut vary in form. The press bed is usually either rectangular or round and the difference is almost certainly connected to the way in which the pressing was carried out.

11 Młynarczyk and Burdajewicz, “The North-West Church”, *Hippos* 2004, p. 55–57, figs. 18–19, 61–63.

12 Młynarczyk and Burdajewicz, “North-West Church Complex”, *Hippos* 2005, p. 42–45, fig. 65.

13 Cf. Frankel 1999, p.181–183, chart 5.

14 Dentzer-Feydy et al. 2003: Si 8, c.5x6m. [pl. 90]; Si 21, c 4x4 m. [pl. 96.1]; Si 91,1 c.4.5x4.5 m. [pl. 98.1]; pressoir 353 c.4.7x5 m. [pl. 102].

15 Frankel 1999, p. 181–183 chart 5.

16 Khalil and al-Nammari 2000, fig.2.

17 Frankel 1999, p.86–88.

18 See discussion in Frankel 1999, p. 192–193.

19 Saller and Bagatti 1949, pl. 18:1, 24:1; Picirillo 1993, pl. 334; Dentzer-Feydy et al. 2003 pl. 121. Renan 1874, pl. 49; Frankel 1999, fig 40.



Fig. 5.12 The northern winery, looking towards west.



Fig. 5.14 The SE vat. Note the replastering of the staircase and the round sump. Looking towards southwest.



Fig. 5.13 The two vats of the southern winery. Looking towards south.



Fig. 5.15 The SW vat, looking towards east.

As opposed to other types of press, in the single fixed screw press the substances to be pressed (in our case the rape left after treading) could not be put in frails under the press as the screw interferes. Instead, it was piled up around the screw, and therefore it was necessary to enclose it in some manner. From ancient sources we learn that there were two different methods for doing this, one using a wooden frame and the other using a wound rope (Fig. 5.35). Hero of Alexandria (*Mechanica* 3.16) describes two such wooden frames in detail, calling them *galeagra*. Drachman suggests that these are the *regulae* mentioned by Pliny the Elder and by Columella as substitutes for pressing frails.²⁰ As regards ropes, Hero (*Mechanica* 3.13) refers to “the rope that was wound round the grapes to be pressed”. Winding a rope around crushed olives is also mentioned in Talmudic literature (Exod. R.36.1 “wound round with ropes”—“מקיפים אותן בחבלים”). In the British Museum there is a relief showing a rope wound around fruit (olives/grapes?).²¹ It is interesting that one of the ways in which the “Baraita of the Lulabim” in the Jerusalem Talmud differs from the other versions is that it adds ropes and wood to the materials of which pressing

frails are made, clearly referring to the single fixed screw press. Returning to the archaeological evidence, it is therefore clear that round press beds are clearly meant for ropes and rectangular ones for wooden frames.

The actual mortices also vary; The two main types are the square mortice of the “Ayalon press” and the closed dovetail mortice of the “Hanita press”. The square mortices, are usually wider at the bottom than at the top, some widening on one side and others on two adjacent sides. The widening is in order to accommodate the broad bottom of the screw and allow it to be fixed in position. However, some of the square mortices, particularly those of the Negev Highlands, are not widened at the bottom, and in those cases the screw was apparently fixed in a wooden base that was emplaced in the square mortice. In the closed dovetail Hanita press, one half of the mortice has straight vertical sides while the other widens towards the bottom on both sides to form the dovetail shaped mortice. In this case the bottom of the screw that widens on both sides is first inserted into the straight sided half and then moved

20 Drachman 1932, p. 60.

21 Brun 2003, p. 200.

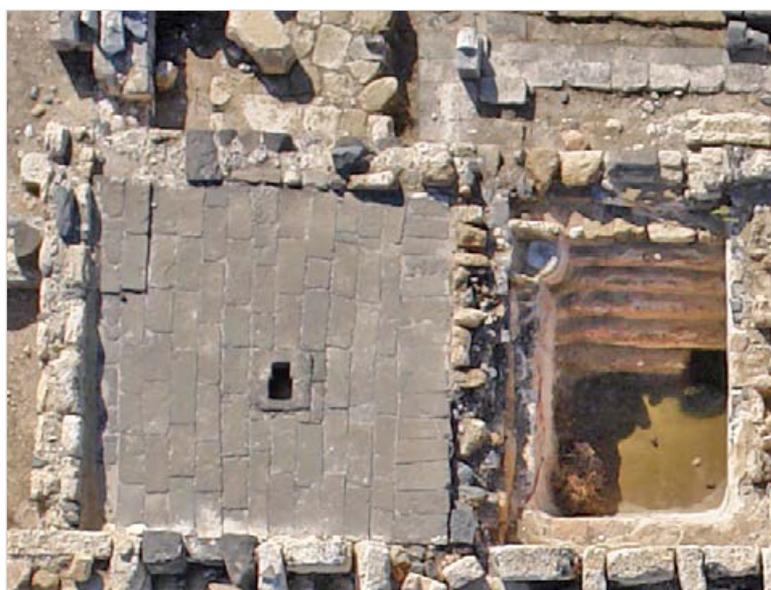


Fig. 5.16 The SE winery.



Fig. 5.17 The SW winery.

sideways into the dovetail mortice. The Ayalon press is found in all parts of Israel except for the Upper Galilee and Phoenicia while the Hanita press is found primarily in these two regions, although a few examples are also found in the central regions of Israel.²² Of the seven screw mortices published from Jebel al-'Arab, five were of the Hanita type (Hauran II: pls. 94,2; 96,1; 98,4; 101,2; 116,1). The remaining two were slightly different, being L shaped rather than “bottle shaped”.²³

The two main forms of the screw mortices are closely connected to mortices of other devices found in the same regions. Square mortices similar to those of the southern Ayalon press appear in the Luvim screw weight found in the Sharon and Carmel regions and in the main type of Grooved Pier Press.²⁴ Dovetailed mortices similar to the northern Hanita press appear in Mi'ilya, Bet Ha-'Emek, and Din'ila screw weights, all being northern types (Frankel 1999: maps 23, 22 and 20) that probably developed in Phoenicia in that order. The Kasfa weight is also based on a dovetail mortice, but while it is found in Israel only in the central regions it is the main type in Syria and probably developed in the north from the Mi'ilya weight.²⁵ Cato (XVIII. 9), when describing the pressing board of an oil press, speaks of “Phoenician Joints” (punicanus coagmenta). As the dovetail mortice appears to be typical of Phoenicia, it is very probable that Cato is referring to that type of joint.²⁶

Another element found in some single fixed screw wine presses is a covered channel or pipe connecting the mortice to the collecting vat, the main purpose of which was apparently to collect the must from the screw press separately from that produced by treading. Varro (*Rerum Rusticarum* LIV 3) recommends keeping the must from the second pressing separately. The connecting channel also kept the screw mortice drained which would benefit the quality of the must and in addition prevent the wooden screw from rotting.

The screw mortices at Hippos are all of the Hanita type with central dovetailed mortices as are others in the region, which suggests



Fig. 5.18 The upper eastern wall of the SW vat. Note the replastering.



Fig. 5.19 The staircase of the SW vat. Note the multiple replastering.

22 Frankel 1999, p. 144,118–119, map 37; 2012, p.117–125.

23 Dentzer-Feydy et al. 2003, pl. 94:1; 105:5. In the latter figure, only one section is presented so that the exact shape of the mortice is not clear.

24 Frankel 1999, p.117, map 23. Often called the Judean Pier Press, see Frankel 1999, p. 128, map 26.

25 Frankel 1997; 1999, p. 114, 118–119. See also Frankel 2012 and Ayalon 2015.

26 Frankel 1999, p. 86, 165; Drachman 1932, p. 118–9, fig. 39.



Fig. 5.20 A detail of the plastering of the upper northern wall of the SE vat.



Fig. 5.22 The SE treading floor.



Fig. 5.21 The SW treading floor.



Fig. 5.23 Sieving intermediate vats and a feet washing basin (?) built to the western wall of the SW vat.

connections to Phoenicia (Figs. 5.1, 5.3, 5.7, 5.21–5.22, 5.29–5.34). The press beds of the NE and SE wine presses were rectangular but that of the SW press was round. It is of interest that at Yajuz the shape of the press beds also differs from each other. The press bed of the southern screw mortice is rectangular but that of the northern is round.²⁷

Apparently there was a connecting channel only in the SE screw mortice and its course was examined using GPR (Ground Penetrating Radar) in order to reveal the path of the channel beneath the basalt flag stones (Fig. 5.36).²⁸ The reading succeeded in penetrating the basalt slabs and showed that the course of the channel is not a direct one towards the exit to the vat, but instead it turns towards the south and then turns west to the exit point.

As regards the actual mortices, none of the three are simple Hanita dovetail mortices. In the NE and SE mortices, instead of the widening sloping, it is stepped, while the SW mortice is again different and

more complicated (Figs. 5.33–5.34). In front, on the south side, it widens very sharply at the top in a circular fashion, and the back is also rounded showing that the bottom of the wooden screw was rounded as well. The SW press is different from the other two in several ways. The paving stones are sealed with lead, the screw mortice is rounded in section, and the press bed is also rounded. At Yajuz the round press bed is the later one, suggesting that the SW press at Hippos is also the later one.

The Small Installations

The six small installations standing to the west of the SW wine-press consist of two sets of three small adjacent floors on either side of a sunken pathway (Figs. 5.1–5.4, 5.7, 5.10–5.11, 5.25–5.26). Unlike the treading floors of the three presses described above which are paved in basalt flagstones, all six installations are paved in white mosaic. The installations are of different sizes; five are

²⁷ Khalil and al-Nammari 2000.

²⁸ Conyers, “Ground-penetrating Radar Tests in Hippos”, *Hippos* 2005, p. 104–105.



Fig. 5.24 A staircase leading to the SE vat and a sieving intermediate vat built to its eastern wall.



Fig. 5.27 The Northwest Church, a twin tomb that was reused as a wine cellar.



Fig. 5.25 The northern auxiliary mosaic floor of the six SW installations.



Fig. 5.26 The northwestern six SW installations.

smaller, ranging in from 5.6–7.2 m² while the southern one in the western row is larger—18.2 m². The walls of all the installations are very thin and poorly built, evidently not intended to carry any roof except for some light weight organic covering. The eastern three are connected to small collecting basins approachable from the sunken pathway while the western three drain out through narrow channels. These also lead to the pathway where probably portable jars or pithoi would have been placed to receive the liquid. The question is what was the purpose of these unusual installations. We suggest several possibilities:

a] The eastern group was excavated first and at that stage we suggested that these were auxiliary floors attached to the SW wine-press similar to those of the NE wine-press on which the grapes were left standing for some days before being trodden on the main floor. The small collecting basins would have been to collect the first must that flowed from the grapes without treading. However, there was apparently no gap in the wall between the SW wine-press and the eastern group of small floors, making the transferring of grapes to the SW treading floor a very difficult task. After the second western group of floors was uncovered it became much more probable that all six floors were connected and that the eastern group was not part of the SW press.

b] Wine presses in which the must is collected in large open collecting vats, like those of the three large wine presses at Hippos, are typical of regions where it does not rain in the summer months, such as the Southern Levant, Egypt and North Africa. In regions such as Greece, France and Italy, where there are considerable quantities of rain during the vintage season, a different technical tradition developed.²⁹ From archaeological excavations and from depictions on Greek vases and on mosaic pavements we learn that the common method in these regions was to allow the must to flow directly into ceramic vessels.³⁰

29 For quantities of rainfall in the summer months, see Frankel 1999, p. 60.

30 For excavations at Athens and the Acropolis see Dorpfeld 1895, p.168–9, figs. 5, 6; for Greek vases see Frankel 1999, fig 2; Brun 2003, p. 198; for mosaic pavements see Brun 2003, p. 56 (Spain), p. 57 (France), p. 201 (Italy).



Fig. 5.28 A rectangular mosaic hall at the northern winery on the Northwest Church.



Fig. 5.29 The NE screw mortice.

The western group of the small installations could clearly have been used to make wine in this manner and we have considerable evidence of techniques being brought to the region from other areas, particularly by monks.³¹ However, the small collecting basins in the eastern group of installations were not suitable for wine production, and if we presume that all six installations served the same purpose another explanations must be sought.

c] The most probable use to which the six small floors were put was to produce raisins. Raisins were apparently produced in different ways. Columella for example (*Rei Rusticae* XII.39.1), quoting Mago the Punic agronomist, stipulates that the grapes should be placed on reeds, fixed on stakes four feet apart and yoked together with poles. But usually they were probably laid on the ground or on leaves to dry in the sun. At Hippos, in the eastern floors, the little juice that flowed from the grapes while they were drying would have been collected in the small collecting basins and in the western floors it would have flowed directly into ceramic vessels.³² A possible explanation for the fact that the three eastern installations had

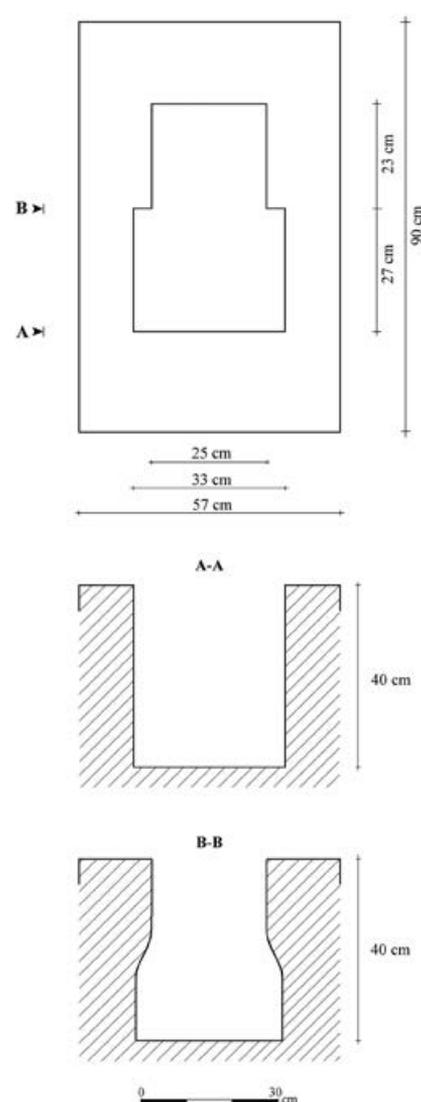


Fig. 5.30 The NE screw mortice, a plan and sections.

collecting basins while the western ones did not is that there would not have been room in the intermediate passageway for two groups of ceramic collecting vessels so that the juice that flowed into the basins of the eastern group was probably ladled into the movable vessels of the western group (Fig. 5.37).

Since the Hippos installations are apparently unique, the question arises as to where raisins would have usually been produced. The circular installation from Ovdar in the Negev also lacked collecting vats, and Kloner suggested that it was for drying fruit.³³ This however is another unique installation, and the apparent lack of other installations for producing raisins is probably to be explained by the fact that grapes could be dried to produce raisins on the treading floor of any wine-press and could even have been dried on auxiliary floors of complex wine presses while the other parts of the press were being used to produce wine. In the Tosefta (Tohorot 11:9) it is stated that raisins were made on a “floor of soil” *הַפְּתִיחַ שֶׁל אֲדָמָה* and Urman has shown that *הַפְּתִיחַ* is the term used in the Hebrew of the Mishna and the Tosefta for auxiliary floors.

31 Frankel 1999, p. 118–119, 169.

32 See discussion above about first must in the section dealing with the Large Wine Presses.

33 Mazor 1981, no. 9, p. 53, 57, 58.



Fig. 5.31 The SE screw mortice.



Fig. 5.33 The SW screw mortice.

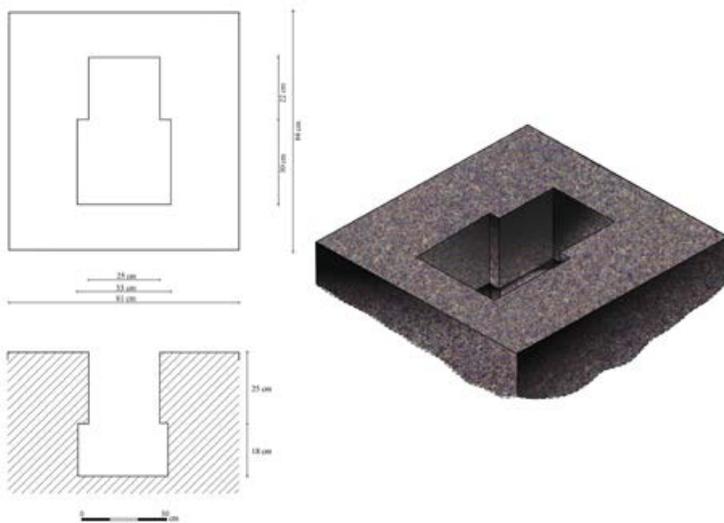


Fig. 5.32 The SE screw mortice, a plan and sections.

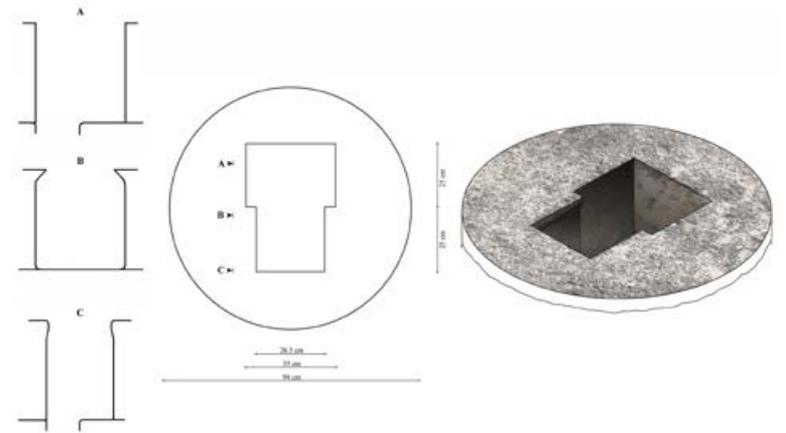


Fig. 5.34 The SW screw mortice, a plan and sections.

He also reported that the term $\Pi\Omega\psi\Omega$ is used by the Druze in the Golan for auxiliary floors in the presses they use to make “dibs” (wine syrup), clearly a survival of the ancient term.³⁴

Dating

The first stage of the NWC is dated from the second half of the 5th century to the early 6th century CE. However, it is difficult to determine when exactly the winery was added. The body sherds found in the plaster of the vats belong to cooking pots and mainly the “Beisan” type jars that are dated to the late Byzantine-Umayyad Period. Judging by the excavation reports, stratigraphical probes and the architectural relationships, it seems probable that the winery was built during the Early Islamic Period but we cannot overrule the possibility that it may have already been added during late Byzantine Period. The winery complex of Hippos is part of the last phase of occupation of the site and is connected to the final

stage of the Northwest Church. The winery complex was almost certainly in use until the final destruction of the city in 749 CE.

Pollen Analysis

18 pollen samples have been extracted by P. Geyer at 2009 from the plasters of the installations of the southern winery complex. The published results confirm the use of the winery complex for the wine industry being the *Vitis* species (grape) comprise the highest percentage among of the taken samples.³⁵ The highest values of *Vitis* were extracted from the plaster spouts and basins of the six western installations. Surprisingly, a relatively high percentage of *Cerealia* pollen (9.5%-15.5%) was extracted from the pollen samples of the western vat (F1107). It may well be that in-between harvest seasons the western vat was used as a granary. There is evidence that the NWC atrium was used as threshing floor during the final stages.³⁶

34 Urman 1974.

35 Geyer, “Pollen Analysis of the Winery Complex Adjacent to the North-West Church”, *Hippos 2009*, p. 93–103; see also in this volume, “Pollen Analysis”.

36 Młynarczyk and Burdajewicz, “The Northwest Church Complex”, *Hippos Summary Report I*, p. 214, fig. 291.

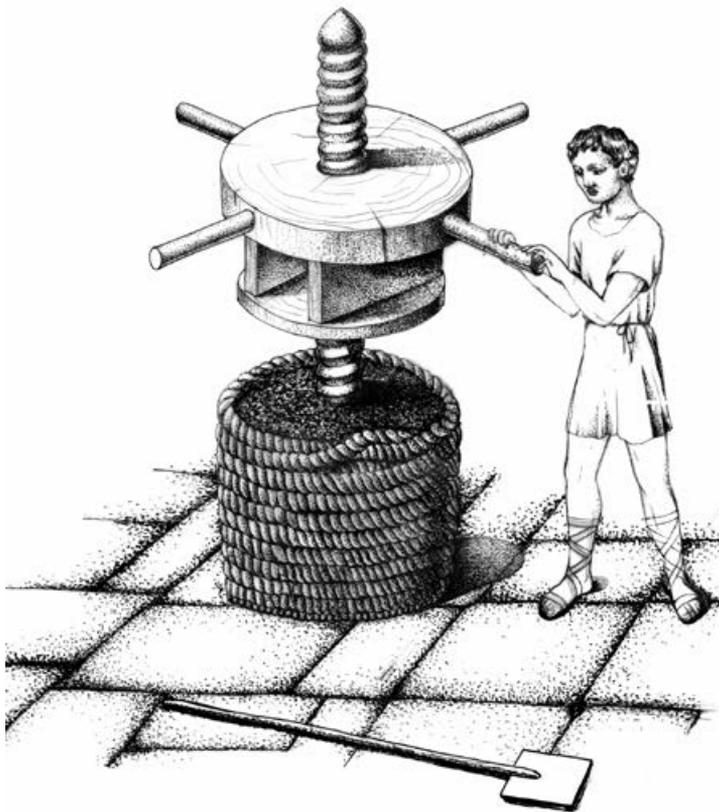


Fig. 5.35 A suggested reconstruction of a single fixed screw winepress found in all three wineries at Hippos-Sussita. A press operation above a round mortice using a wound rope.

Economic, Historical and Cultural Aspects of the Hippos Wine Presses

The fact that there were three wine presses in the NWC complex made it possible to work continuously without interruption. While grapes were being brought to one press and trodden there, the must of a previous batch would be fermenting in the collecting vat of one of the other presses and the fermented must of yet an earlier batch would be in the process of being transferred to jars in the third. In spite of the great variations in all quantitative estimations, we will attempt to assess the quantitative aspects of the Hippos wine presses.

Presuming that the duration of the vintage season was fifty days, that a fresh batch of grapes was processed each ten days, and that the three collecting vats held 15.7 m³ of must, the total amount of must would have been 15.7x5=78.5 m³ (78,500 litres). One kg. of grapes produces 0.68 litres of must, therefore one liter of must was produced from 1.47 kgs. of grapes, and 78,500 liters x 1.47 will amount to 113,395 kgs. of grapes processed. Since each vineyard dunam produces an average of 1277 kg. of grapes, then 113,395 kgs. divided by 1277 equals 89 dunams, which would be the area of the vineyards in dunams (10 dunams equal approximately one hectare and 4 dunams equal approximately one acre). These vineyards were almost certainly located in the valleys at the foot of Mt. Sussita.³⁷ The wine presses and the oil press at Hippos are all built around and clearly connected with the North-West

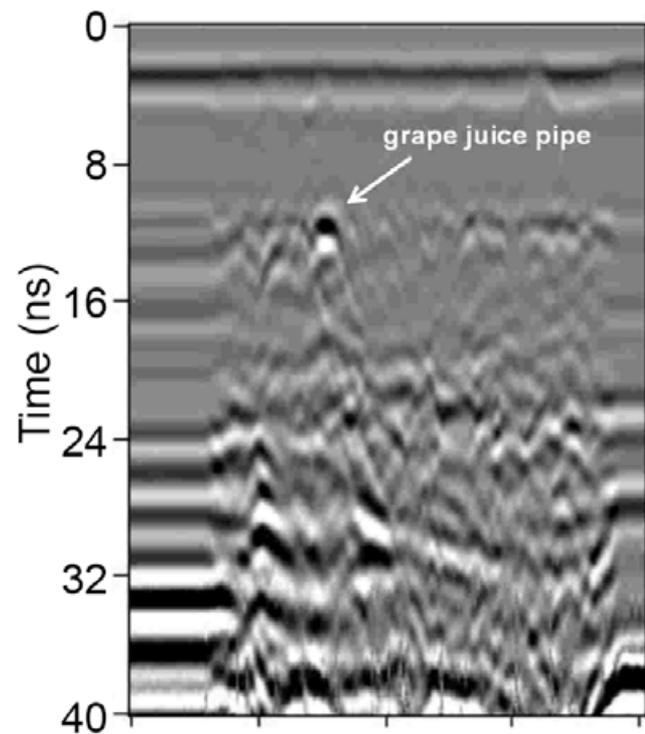


Fig. 5.36 Ground-penetrating radar results at the SE treading floor. Small reflection hyperbola caused by a pipe for grape juice to flow into a vat.

Church. The association of wine and oil presses with churches is very common and as Hadjisavvas has shown, basing his argument mainly on evidence from Cyprus, the connection of oil and wine production to temples, sanctuaries and churches is part of a very old tradition.³⁸ The reasons for this association are presumably a combination of ritual and economics. The use of wine and oil in religious rites and ceremonies created a demand for sanctified products which enhanced the economic power that the religious institutions already had.

It is difficult to determine when exactly the wine presses at Hippos were built, but they were clearly in use from the Early Islamic Period until the city was destroyed in the earthquake of 749 CE. Sharon suggests that “the town was in ruins long before the earthquake”, but this could be true only for a small part of the city as the pottery and numismatic evidence from recent excavations have clearly shown that the sudden destruction and abandonment of the site was connected to the 749 earthquake.³⁹

It is generally thought that after the Muslim conquest the production of wine declined sharply mainly because of the Muslim prohibition of drinking wine.⁴⁰ The fact that the wine presses at Hippos continued in use until the middle of the 8th century could be explained by the fact that they were associated with a church and would therefore not be affected by the Muslim prohibition. However, an alcoholic beverage, “baskarat susiyah” mentioned in an anecdote in Arabic, was apparently produced at Hippos (Hippos-Sussita in Arabic was

37 See Khalil and Al-Samari 2000, p. 48 for the sources of the parameters on which these calculations were based.

38 Hadjisavvas 1992, p. 82–84. See also Stager and Wolff 1981.

39 Sharon 2006, p. 43–44.

40 See for example, Ayalon 1997.

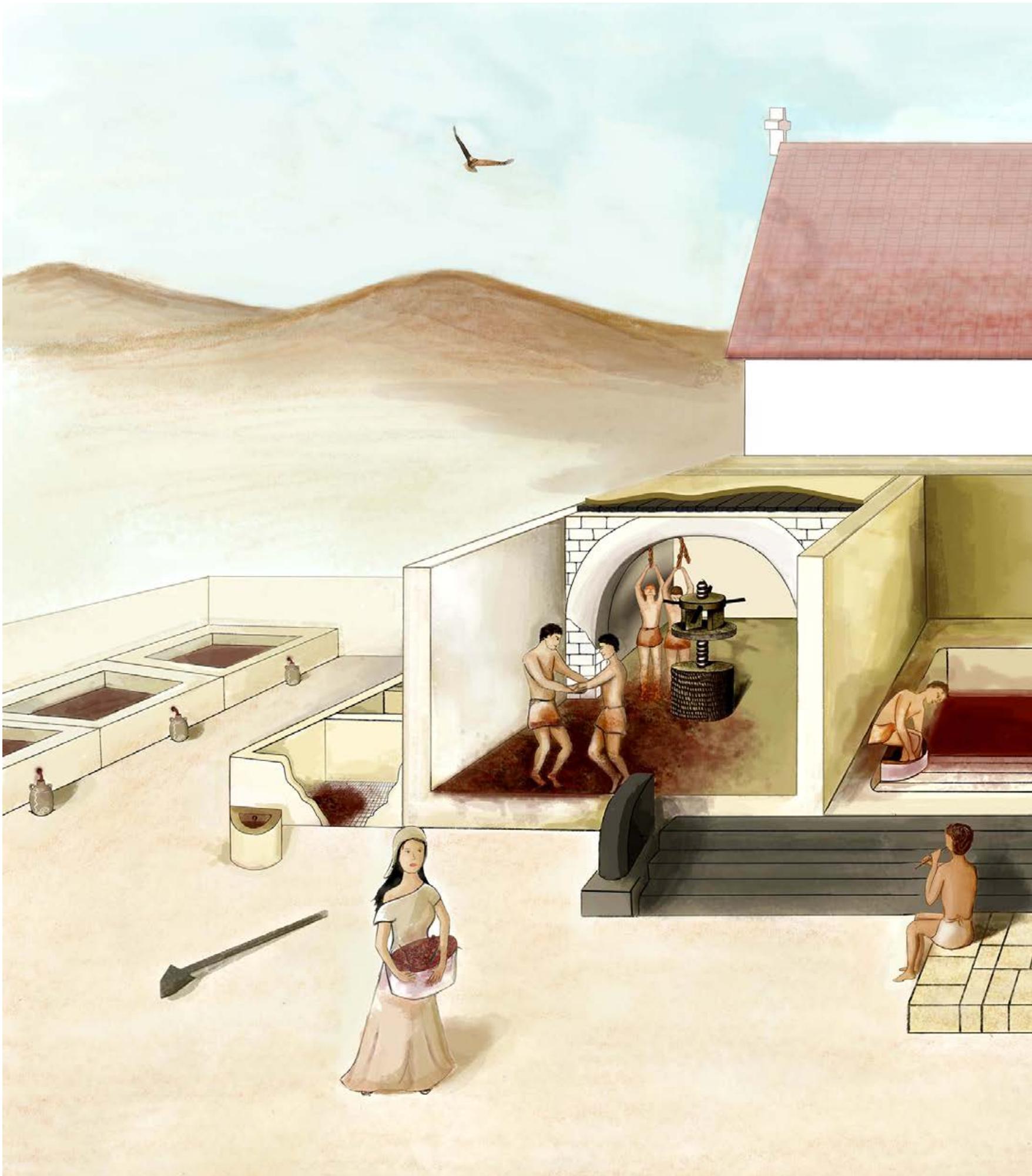
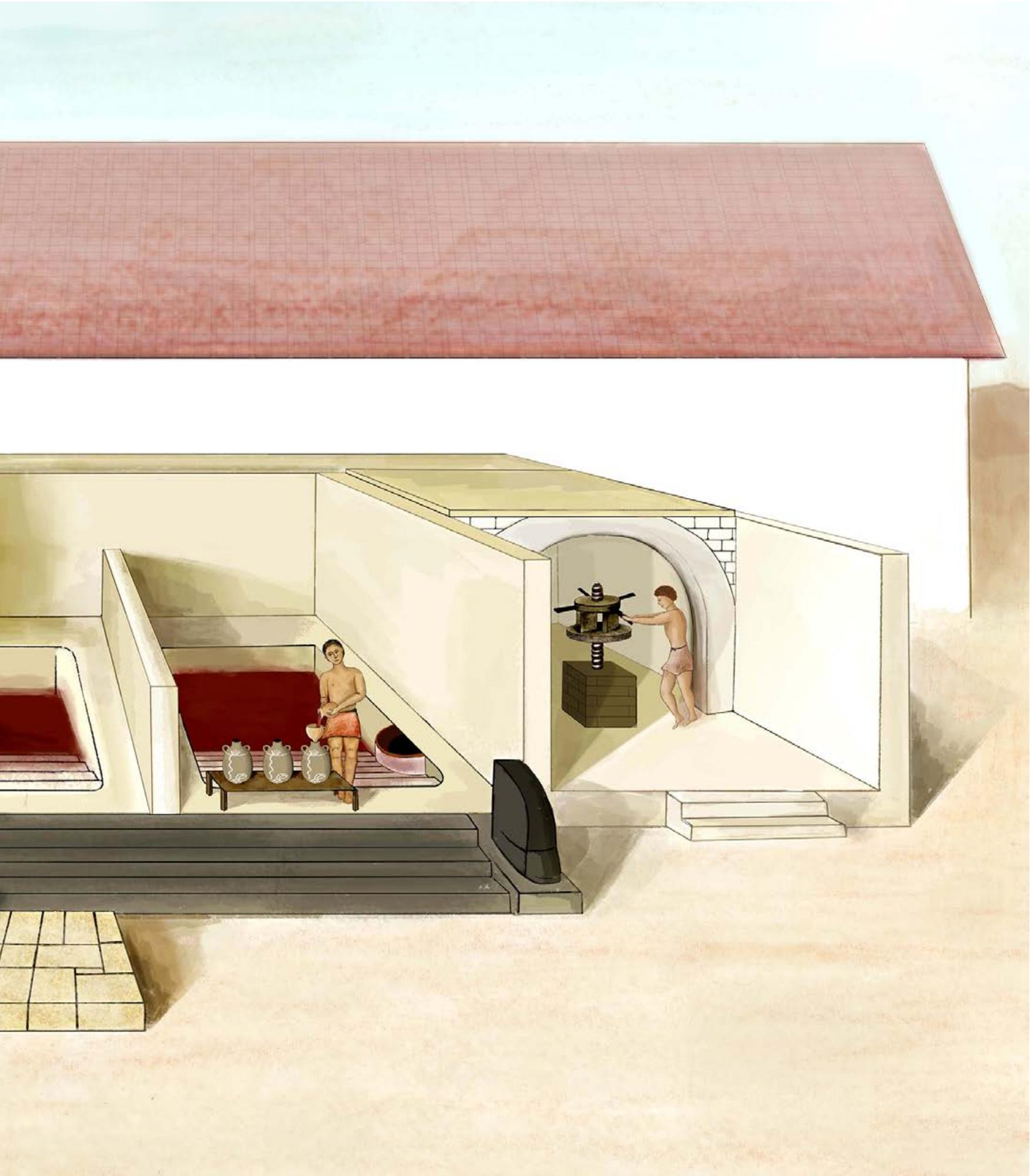


Fig. 5.37 A suggested reconstruction for the operation of the northern winery of the Northwest Church Complex.



Susiyah).⁴¹ In addition, it must be pointed out that several of the wine presses in the region of Jebel al-'Arab to the east of Hippos were in use long after the Arab conquest, some were actually built after the conquest, and none of these were associated with churches (see Walker 2006:81 for a concise list). A particularly impressive example is Si' 8, dated to the end of the Umayyad Period.⁴² Wine is frequently mentioned in Arabic literature, and much discussion has been devoted to the significance of these

references and to the degree to which wine was consumed in the Muslim world in spite of the prohibition.⁴³ These discussions were based primarily on written sources, but the archaeological evidence provides additional proof for wine consumption. Today it is clear that both the production and the consumption of wine, particularly by the upper classes, was more common in the Muslim world than is usually appreciated. This clearly has implications as regards the significance of the Hippos wine presses.⁴⁴

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41 Sharon 2006, p. 43.

42 Dentzar-Feydy et al. 2003, p. 121.

43 See for example, Sadan 1973; Heine 1982.

44 See also the discussion in Dentzer-Feydy et al. 2003, p. 170–171.

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