

# SWISS-LIECHTENSTEIN EXCAVATIONS AT AZ-ZANṬŪR IN PETRA 1994 THE SIXTH CAMPAIGN\*

by

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The sixth season of excavations by the Archaeological Institute of the University of Basel and the Swiss-Liechtenstein Foundation of Archaeological Research Abroad (SLFA) on the terraces of the northern slope of az-Zanṭūr took place under the co-direction of Bernhard Kolb and Rolf A. Stucky from August 24th to October 11th, 1994. Having received the official excavation permit from Mr Faisal Qudah, then Acting Director-General of the Department of Antiquities in 'Ammān, we arrived at Petra on August 24th. Thanks to the hospitality of the Jordanian Department of Antiquities, we were again able to lodge in Nazzal's Camp.

Participants of the sixth campaign were as archaeologists: Marie-Claire Crelrier, Yvonne Gerber, André Barmasse, Daniel Keller, Christoph Schneider and Stephan Schmid; as architect: Heidi Stoffel; as archaeo-osteologist: Jacqueline Studer; as archaeobotanist: Christiane Jacquat and as restorers: Christine Keller and Christine Pugin. For two months a team of collaborators under the supervision of Ulrich Bellwald was working on the restoration and consolidation of the exposed structures (walls and pavements) on the upper terrace.

The following persons have contributed

to the present report: R. A. Stucky ( Nabataean Structures), B. Kolb (Late Roman Structures), S. G. Schmid (Nabataean Fine Ware Pottery), Y. Gerber (Nabataean Common ware Pottery), U. Bellwald (Restoration) and Chr. Jacquat (Archaeobotany).

Continuing the work of the five preceding campaigns, we resumed the excavations in the two following areas:

- on the upper terrace of az-Zanṭūr (Nabataean and Late Roman)
- on the lower terrace of az-Zanṭūr (Nabataean).

We investigated the dating of the various large-scale destructions of the town in a series of small soundings in the large dumps on the western slope of az-Zanṭūr.

## **Excavation on the Upper Terrace (Figs. 1-4)** *The Nabataean House*

The excavation of rooms XXI and XXV which were built on a level 3 m lower than the northwestern façade of the large Nabataean dwelling was continued.<sup>1</sup> At the end of the 1994 season room XXI, the bronze founder's workshop, was completely cleared as well as most of room XXV (Figs. 1-2).

The consolidation of the paved floors within the Nabataean and Late Roman houses allowed soundings to be made in

\* The following abbreviations have been used :  
Campaign 1988 : R. A. Stucky, 'Schweizer Ausgrabungen in ez-Zantur, Petra. Vorbericht der Kampagne 1988', *ADAJ* 34 : 249-283. Campaign 1989: R. A. Stucky *et al.*, 'Swiss-Liechtenstein Excavations at ez-Zantur in Petra 1989 - The Second Campaign', *ADAJ* 35 : 251-273. Campaign 1991: R. A. Stucky *et al.*, 'Swiss-Liechtenstein Excavations at ez-Zantur in Petra 1991 - The

Second Campaign', *ADAJ* 36 : 175-192. Campaign 1992: B. Kolb and R. A. Stucky, 'Preliminary Report of the Swiss-Liechtenstein Excavation at ez-Zantur in Petra 1992 - The Fourth Campaign', *ADAJ* 37 : 417-425. Campaign 1993: R. A. Stucky *et al.*, 'Swiss-Liechtenstein Excavations at ez-Zantur in Petra 1993 - The fifth Campaign', *ADAJ* 38 : 271-292.

1. See Campaign 1993, Fig. 1. (room XXI).



1. Upper Terrace: Nabataean room XXI seen from the west.



2. Upper Terrace: view of Nabataean room XXV from the north.

different places. Thus in sounding H in room XVII below the paved floor with hexagonal stone slabs, we reached a depth of about 3 m.<sup>2</sup> Apart from the manifold information we got on the chronological sequence of the Nabataean fine ware and the contemporary commonware we also established that this room had not only been erected during the second building-phase - in contrast to our original assumption<sup>3</sup> - but that it had been built on a previous structure which had also been decorated with painted plaster.

Sounding G in room II<sup>4</sup> helped to add some further elements to the knowledge in the scope of early pottery. In the eastern profile of this sounding a handle of a jug decorated with a silen's head has been found (Fig. 12).<sup>5</sup>

### *The Bronze Foundry*

Of special interest were the finds from the irregularly paved floor of room XXI. In the debris we uncovered a considerable number of moulds made of plaster. According to the analysis of the objects found in 1993, which have been consolidated and restored in Basel, we are dealing with casts from feet of Greek-Hellenistic couches (so called "*klinai*"), lamps, bells and figural reliefs. After cleaning, consolidation and putting together the individual pieces of entire models in the laboratory of the Antikenmuseum Basel we were able to draw comprehensive conclusions about the casting technique and the procedures followed by the Nabataean bronzesmiths when producing luxury products from several part-moulds. These finds are important because a

comparably large number of moulds are known from only three other sites: Begram (Afghanistan),<sup>6</sup> Ktesiphon (Iraq)<sup>7</sup> and Mit-Rahine (Egypt).<sup>8</sup>

The pottery, painted and plain Nabataean bowls, give evidence for the date of destruction of the workshop in the late first century AD. The various casts and the other finds from room XXI and room XXV, which leads off it, will be published in detail in the series of the SLFA "*Terra Archaeologica*".<sup>9</sup>

In an earlier phase the inhabitants of the Nabataean house obviously tried to save the statically unstable first façade by adding a further room (VII). Connected with this first rebuilding is also the construction of room XXV on the lower level, which was almost entirely destroyed by recent clandestine excavations (Figs. 1 and 2). This room is remarkable on the one hand for a sewage channel covered with stone slabs which runs from the entrance door in an east-westerly direction across the room and, on the other hand, because of an arch which is intact. This arch must have supported a roof, and possibly a useable terrace. After the collapse of rooms XXI and XXV the individual blocks from the arch lay in a straight line on the compressed earth floor of room XXV. It was probably directly connected with room XXI which was built during the second phase of reconstruction. The coarse floor made of hard boulders of limestone in room XXI shows clear marks of wear from water (Fig. 1).

### *Late Roman Structures*

Soundings in the Late Roman rooms 3, 5

2. Campaign 1993, Fig.1.

3. See Campaign 1992, Fig.1

4. Cf. Campaign 1993, Fig.2.

5. See *infra*, 'Nabataean Fine Ware Pottery'.

6. O. Kurz, Pp. 110 ff. in J. Hackin, 'Nouvelles recherches archéologiques à Begram', *MémDAFA* 11, 1954: 110 ff.

7. M.M. Negro Ponzi, 'Some Sasanian Moulds', *Mesopotamia* 2, 1967: 57-92.

8. C.C. Edgar, 'Greek Moulds', *Catalogue général des antiquités égyptiennes du Musée du Caire* 8, (Kairo, 1903); Carola Reinsberg, *Studien zur hellenistischen Toreutik*, Hildesheimer ägyptologische Studien 9 (Hildesheim, 1980).

9. For the plaster models see Campaign 1993, R.A. Stucky *et al.*, *Petra. ez-Zantur I. Ergebnisse der Schweizerisch - Liechtensteinischen Ausgrabungen 1988-1992* (in print).



3. Upper Terrace: Late Roman court 3 with exposed channel C looking SW.



4. Upper Terrace: channel C and silting tank in Late Roman court 8 looking SW.

and 8 broadened our knowledge of the 'water system' in houses H1 and 2.<sup>10</sup> Channel C in room 6 had already been partially exposed in 1992. It ran under the staircase to the western corner of room 10 and emptied into the main channel on the north-western side of the terrace.

The work completed in 1994 followed the course of channel C in the Late Roman room layout.

After its exit from room 6 it runs straight across courtyard 3 (H1), bends a little towards the south under the western part of corridor 5 and ends in a silting tank in courtyard 8 (H2) (Figs. 3,4). The course of the channel just described is easy to follow on the detailed top plan at the points where the Nabataean floors were mended.<sup>11</sup> The silting tank in courtyard 8 had been later covered with a flagstone and the entrance to the main channel west of room 10 had been blocked with a stone. We may therefore conclude that channel C was only used during the Late Roman phase I (early fourth century AD-363).<sup>12</sup>

The silting tank is the only part of the channel with a stone floor. We thus come to the most important problem in the interpretation of the channels of az-Zanṭūr: the absence of watertight (stone or plaster) channel-floors. The water appears to have flowed directly over the trampled sandy floor. Did the channels serve as a drainage system, or as a system to provide drinking water? M. Evenari's investigations in the Negev are important in this respect.<sup>13</sup> He has demonstrated that when it rains sandy ground is relatively quickly saturated and

then functions as a watertight surface. This means that we cannot assume *a priori* that the channels acted as a drainage system. When one considers the relatively low standard of building of the Late Roman settlers, it would be rather surprising if the elaborate channel system had been built purely for drainage. We can say with certainty that neither of the houses had cisterns in their courtyards and that rainwater was collected on the roofs of rooms 2, 10 (H1) and 9 (H2) and piped into the channel system.<sup>14</sup> Both these points indicate that the system was used to provide drinking water, probably organised around an external cistern in the area north-west of the terrace. However since we have been unable to locate a cistern up until now, this remains a conjecture.

The position of the silting tank at the end of channel C suggests that the water, sullied in courtyard 8 was emptied into the tank in order to purify it before it flowed into the cistern.<sup>15</sup>

#### Excavations on the Lower Terrace (Figs. 5-9)

The central part of the excavated structures is dominated by several cisterns and channels which had been cut from the bedrock (Figs. 5,9).<sup>16</sup> Because of the different orientation and fillings consisting of stones and mortar the aforementioned system belongs to at least two different phases.

Some of the exposed rooms on the northern slope were built on substructures; the floors were supported by arches as is shown by one completely preserved stone arch running between two substructure walls (Figs. 6,9). Two further but collapsed arch-

10. See Campaign 1992: 421, Fig. 5 (Groundplan of H1 and 2) and 6 (Elevation of H1 and 2)

11. Cf. Campaign 1992:417ff.; Campaign 1989: 252, Fig. 1.

12. Cf. Campaign 1992: 422.

13. M. Evenari, L. Shanan and N. Tadmor, *The Negev: The Challenge of a Desert*, (Oxford, 1982): 109. Quite how correct this statement is, was demonstrated dramatically during a rain-

storm in Petra in 1994. Within a few minutes the water no longer seeped into the ground but flowed down the slopes in streams.

14. Cf. Campaign 1992: Fig. 6.

15. We cannot judge the expectations regarding cleanness of the drinking water of the people other than by modern standards.

16. Cf. Campaign 1993: Figs 5 and 7.



5. Lower Terrace: general view of excavation from the south.



6. Lower Terrace: arch and substructures in square 116/K looking NE.

es have been exposed. The larger part of the walls along the northern slope of the lower terrace cannot be directly connected with dwellings or rooms but must rather be seen as elements of an extensive substructure; the walls of the rooms were built on top of the substructures and are unfortunately lost. A strange and unusual feature of the above mentioned substructures is their oblique alignment to the sloping area of the terrace. The Nabataeans obviously tried to solve the static problems involved in constructing houses on terraces without proper retaining walls by stabilising the exposed façades with walls, respectively. rooms, which were built on a lower level, that is in the sloping area beneath the terrace, at flat angles to the walls of the major buildings.

In both cases, room XXI on the upper terrace and the rooms in the Nabataean house facing the slope on the lower terrace, the chosen method of stabilisation seems to have failed: the walls could not resist the static thrust and collapsed.<sup>17</sup>

In the western area on the lower terrace (Fig. 9) we exposed the remains of a probably unroofed kitchen with a *ṭabūn* (Figs. 5,7). In the northern squares 115-116/H, directly above the bedrock we cleared another room with a *ṭabūn* (Fig. 7), a corridor and a square structure filled with earth, stones and pottery which was probably intended to stabilise the building. The room in which the *ṭabūn* is situated opens on its northern side onto a paved corner which is possibly part of a peristyle structure. We have so far uncovered a column and a stylobate which stretches northwards (Figs. 8, 9:116/H).

While the walls of the kitchen in the west are constructed of blocks of soft sandstone, the masonry of the room opening onto the peristyle is of carefully dressed

limestone ashlar.

Dated from the pottery and the lamps, the first Nabataean house on the lower terrace seems to have been built during the early first century AD and destroyed only a generation later. The second house was built immediately after the destruction of the first one and was destroyed during the later first century AD - some years earlier than the house on the upper terrace. Taking into account the dating of the pottery found there and the base of the *ṭabūn* (116/H), which is above ground level we can assume that the rooms in the northern part of the terrain continued to be used in the second and third century AD- after the destruction of the house mentioned above.

**Nabataean Fine Ware Pottery** (Figs. 10-13)  
*Trefoil-mouth jug with silen's head-applique*  
During an expansion of trench G<sup>18</sup> in 1994 we found a rim fragment and a handle of a trefoil-mouth jug with an applique in form of a silen's head (Figs. 10-12).<sup>19</sup> Beside the complete handle we have the lower point of an attachment on the shoulder of the jug as well as a part of the rimprofile. On the handle there are two cross-pieces still *in situ* while a third one has been lost. Between those cross-pieces *lituus*-shaped clay pads are applied. On the top of the handle one sees a further, broken, clay pad that probably once formed a thumb rest.<sup>20</sup> The model-formed silen's head-applique was applied before firing and is situated at the attachment point of the shoulder. Small fissures on the head and on its right side mark the application points; on the left side traces of remodelling are clearly visible. The silen's head has a long beard with very elaborate strands. Above the mouth the characteristic and typical snub nose is visible. The

17. See Campaign 1993: Fig. 1 (room XXI)

18. See Campaign 1993: Fig. 2.

19. EF 903; 917.51 m;x = 1.64;y = 4.79.

20. For similar devices see L. Pirzio Biroli Stefa-

nelli *L'argento dei romani. Vasellame da tavola e d'apparato* (Rome, 1991) :186, Fig. 180; p. 275 cat. no. 102.

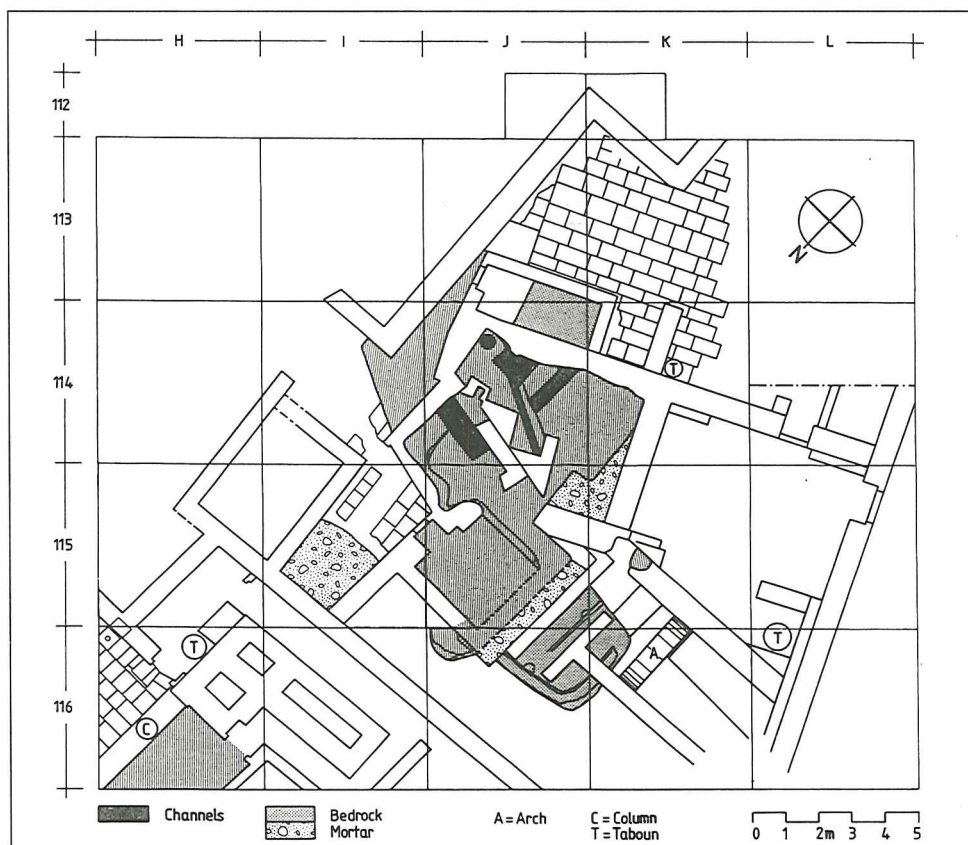


7. Lower Terrace: *ṭabūn* in kitchen: squares 115-116/L.



8. Lower Terrace: view of excavation in square 116/H looking SW.





9. Az-Zanṭūr: ground plan of the Nabataean structures on the lower terrace.

tense looking eyes are framed by bushy and contracted brows which evoke a somewhat ferocious expression. The hair melts into the beard on the sides of the head and is piled up to a high coiffure on top with three combed up forelocks. Contrary to many other silen's head-appliques which have comical faces<sup>21</sup> our example has a rather serious expression that is reminiscent of Hellenistic *pathos formulae*.

The ware, the firing and the colour of the clay are absolutely identical with other Nabataean pottery found in these layers.<sup>22</sup>

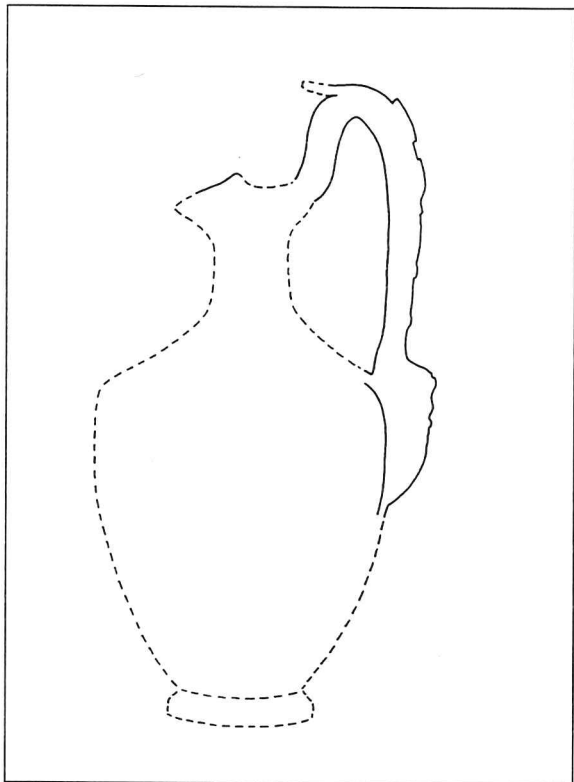
We must therefore conclude that we are dealing with a local, that is Nabataean piece. The shape of the vessel is deducible from the partially preserved rim, which gives an approximate trefoil form. Another element is the curve of the handle and the shoulder, suggesting a rather high neck. Finally, silen's head-appliques on handle-bearing vessels occur almost exclusively on trefoil-mouth jugs, respectively on *oinochoai*.<sup>23</sup> A good comparison piece for the overall shape of our jug is a ceramic trefoil-mouth jug from Pompeii dated to the first

21. Some of them evoking theater masks; cf. D. B. Thompson, *Ptolemaic Oinochoai and Portraits in Faience. Aspects of the Ruler Cult* (Oxford, 1973): 41 with note 2.

22. The handle and the rim fragment were found in a sequence of layers containing exclusively fine ware of our phase 2a which covers the third quarter of the first century BC giving at least a *terminus post quem non* for dating the piece; for

the different phases of Nabataean fine ware see also Campaign 1993.

23. Macedonian silver vessels: 'The Search for Alexander. An Exhibition', Exhibition Cat. Washington, Chicago, Boston, San Francisco (1980): 184, Colour Pl. 31, nr. 163; 'Treasures of Ancient Macedonia', Exhibition Cat. Thessaloniki, (1978): Pl. 23, no. 110; M. B. Hatzopoulos - L. D. Loukopoulos (eds.), *Philipp of Macedon*, (Ath=



10. Trefoil-mouth jug with silen's head-applique.  
Scale 1:2.

century AD.<sup>24</sup>

The best stylistic comparisons for our silen's head, are offered by the late Hellenistic epoqe. Several so-called neo-Attic mar-

ble vessels have quite similar silen's heads.<sup>25</sup> It seems that on the marble *crateres* the silen's heads pass through a development from earlier, that is late second century BC, examples with more rounded faces to later pieces with thinner faces<sup>26</sup> and longer proportions of the late first century BC and the early first century AD.<sup>27</sup> Further good comparisons come from a marble basin found in Rome<sup>28</sup> which is dated around 100 BC<sup>29</sup> or in the first half of the first century BC, respectively.<sup>30</sup> There are also some fairly close parallels in clay vessels to the silen's head found at az-Zantür. A similar applique from Pergamon is "...not earlier than the second century BC".<sup>31</sup> Although somewhat more ornamental, silen's head-appliques from Hellenistic braziers found at Paphos (Cyprus) show similar stylistic characteristics.<sup>32</sup> The examples which would fit the best with our silen's head can be dated to the third quarter of the first century BC<sup>33</sup> and therefore to exactly the same period as the layers from which the piece from our excavations originates. Finally, a pear-shaped silver trefoil-mouth jug in the J. Paul Getty Museum, Malibu, shows comparable *pathos-formulae* in the upper part

=ens, 1980): 222, Fig. 124; Ptolemaic *oinchoai*: D. B. Thompson, *supra* note 21, p. 41ff.; Roman silver vessels: F. Baratte, *Le trésor d'orfèvrerie romaine de Boscoreale*, (Paris, 1986): 64, left Fig.

24. 'Pompeji wiederentdeckt'. Exhibition Cat. Antikenmuseum Basel und Sammlung Ludwig, (Rome, 1994): 253 ff. no. 177.

25. D. Grassinger, *Römische Marmorkratere*, *Monumenta Artis Romanae XVIII*, (Mainz, 1991): 324f., Figs. 218-226; D. Grassinger, 'Die Marmorkratere' P. 264 f., Figs. 5-7. in G. Hellenkemper Salies H.-H. von Prittwitz und Gaffron-G. Bauchhenss (eds.), *Das Wrack. Der antike Schiffsfund von Mahdia*, (Köln, 1994).

26. D. Grassinger, *supra* note 25, p. 324, Fig. 218 cat. no. 54.

27. D. Grassinger, *supra* note 25, p. 325, Fig. 224 cat. no. 58; this is the closest parallel to our silen among the marble *crateres* and is dated in the

third quarter of the first century BC, i.e. in exactly the same period as the pottery from the layers where the handle was found.

28. W. Fuchs, *Die Vorbilder der neuattischen Reliefs*, *JdI Ergh.* 20, 1959: 160ff., Pls. 32a. b.

29. W. Fuchs, *supra* note 28, p. 160f.

30. K. Schefold, 'Zur Basis des Domitius Ahenobarbus', P. 281 in: L. F. Sandler (ed.), *Essays in Memory of Karl Lehman*. Marsyas, *Studies in the History of Art*, Suppl. I, (1964).

31. G. Hübner, *Die Applikenkeramik von Pergamon. Eine Bildersprache im Dienst des Herrscherkultes*, *Pergamenische Forschungen 7*, (Berlin-N.Y., 1993): 14f., 45, 76ff., Pl. 3 cat. no. 19.

32. J. W. Hayes, *Paphos III. The Hellenistic and Roman Pottery*, (Nicosia, 1991): 75ff., Pl. XVII. XVIII.

33. J. W. Hayes, *supra* note 32, p. 75. Pl. XVII 2. 3; for the chronology see *ibidem*, p. 108 and 170.

of the applique's face.<sup>34</sup> The jug is said to have been found in Lebanon together with an aureus of Mark Anthony, struck in 34 BC.<sup>35</sup> This date would also fall exactly in our phase 2a.

We would therefore like to conclude that the trefoil-mouth jug to which our applique was once attached, was a Nabataean product of the third quarter of the first century BC. Whether the prototype, probably a metal vessel, from which the model for the applique was taken, was a Nabataean product as well or whether it was imported, can not be clarified at the present state of research.<sup>36</sup> The trefoil-mouth jug with a silen's head applique from az-Zanṭūr is unique among the reported Nabataean fine ware pottery. Although the general shape of the vessel is known from other sites,<sup>37</sup> the rim form and the applique are without parallels. Nabataean pottery with model-formed decoration is known but it can usually be classified as imitations of Hellenistic moulded pottery.<sup>38</sup> Besides this, head-shaped appliques occur on pottery lamps but it is not clear whether these were local products or imported.<sup>39</sup>

### *Figurative painted pottery*

In addition to the figurative painted fragments presented in previous preliminary reports<sup>40</sup> three additional sherds deserve our attention (Figs. 11-13).<sup>41</sup> They show the same characteristics as the almost completely reconstructed bowl with a scenic representation,<sup>42</sup> that is a yellowish clay with white grit, a somewhat carelessly applied painted decoration in dark brown and a degenerated version of the rim from the "classical" flat bowls of the first century AD (phase 3b). What is puzzling is the fact that the subjects of the decoration are almost identical with those on the aforementioned bowl. Clearly visible is a row of dots, a piece of a clumsy palmette and a kind of hand with six(!) fingers. The comparison of different photos and drawings makes clear that the newly presented pieces do not belong to the other bowl.<sup>43</sup> We therefore have two bowls of an almost identical ware, shape and decoration with the only difference so far being that on the new pieces the arm is directed to the rim of the bowl while on the other the arms of the two humanoid figures are directed to the centre

34. A. Oliver, 'Silver for the Gods. 800 Years of Greek and Roman Silver', Exhibition cat. The Toledo Museum of Art, (Meriden, 1977): 114 cat. no. 74.

35. A. Oliver, *supra* note 34, p. 114.

36. Although no Nabataean metal vessels have been found until now it is to be supposed that they existed; cf. M. Vickers, 'Nabataea, India, Gaul and Carthage: Reflections on Hellenistic and Roman Gold Vessels and Red-Gloss Pottery', *AJA* 98 1994: 231-248. For the technique of model formed appliques the antiques the antique sources give no clear information: Strabo 16, 4, 26 reports that gold and silver are Nabataean "products" and records the use of golden cups for symposia; on the other hand he says that embossed and moulded works had to be imported from outside. That this information is - at least partially - incorrect is shown by the finds from the bronze foundry on az-Zanṭūr; see Campaign 1993.

37. For example A. Negev, *The Late Hellenistic and Early Roman Pottery of Nabatean Oboda. Final Report, Qedem 22* (1986): 100, no. 834-837; G. and A. Horsfield, 'Sela-Petra, The Rock of Edom and Nabatene, IV: The Finds', *QDAP* 9 1942: 157f., Pl. XXVIII.

38. A. Negev, *supra* note 37, p. 69f., no. 535-537; G. and A. Horsfield, *supra* note 37, Pl. XIV, no. 69; Pl. XXVII, no. 220; Pl. XXIX, no. 245.

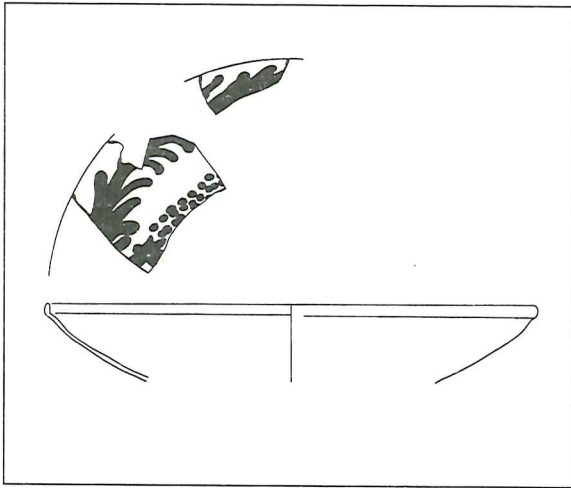
39. G. and A. Horsfield, *supra* note 37, p. 197f. Pl. XLVI, no. 438.

40. Campaign 1993; Campaign 1991, p. 181ff., Figs. 5-9, Pl. V:2.

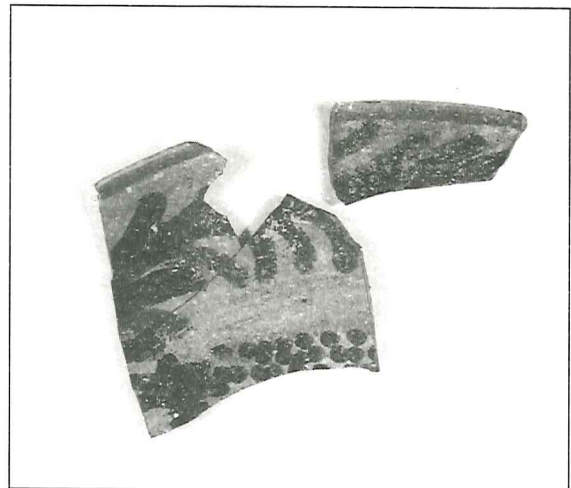
41. FK 371, Abs. 2, 114/k; this unit forms part of the massive destruction level that can be dated to very beginning of the 2nd century BC; cf. Campaign 1993.

42. Campaign 1993, Pl. V:1; Campaign 1991, Fig. 5, Pl. V:2.

43. Compare Fig. 3 with Campaign 1993, Pl. V:1; Campaign 1991, Fig. 5, Pl. V:2.



11. Fine ware fragment with figurative painting. Scale 1:2.



13. Fine ware fragments with figurative painting.



12. Handle of a trefoil-mouth jug with silen's head-applique.

of the vessels. The fact that two different pieces with almost identical decoration were found makes it possible to speak of a single workshop. The uniformity of the decoration could even, for the first time in the history of research on Nabataean pottery, allow us to ascribe the specimens to a single painter whom we would like to call the "Six-Finger-Painter".

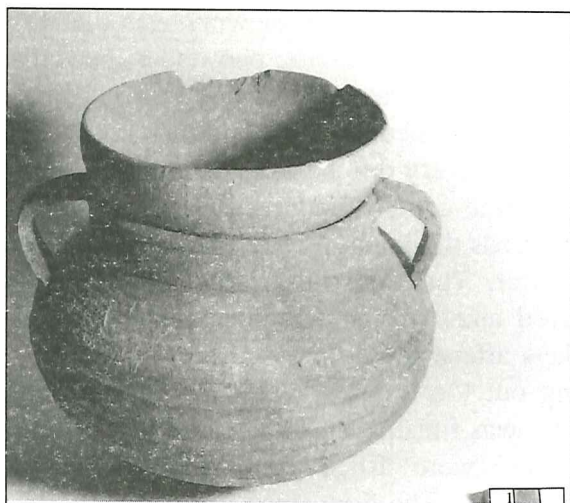
#### A Few Remarks on Nabataean Common Ware Pottery (Figs. 14,15)

In the NE corner of sounding H (room XVII)<sup>44</sup> on the upper terrace at a depth of 0.9m, we discovered an entire pot with a bowl used as a lid (Fig. 14). The pot belongs to the class of kitchenware and could be dated typologically to around the beginning of the first century AD.<sup>45</sup> The bowl belongs to the class of fine ware and is dated to not later than the beginning of the first century by S.G. Schmid. The pot was empty. A closer examination of the interior revealed a brown rim situated about halfway up the pot. There were traces of sinter beneath the brown rim and on the base of the

44. See Campaign 1993: Fig. 1.

45. Compare with the typology of the common ware from az-Zanṭūr from the period 100 BC till the

beginning of the second century AD in: Campaign 1993. A detailed study is the subject of a forthcoming doctoral thesis.

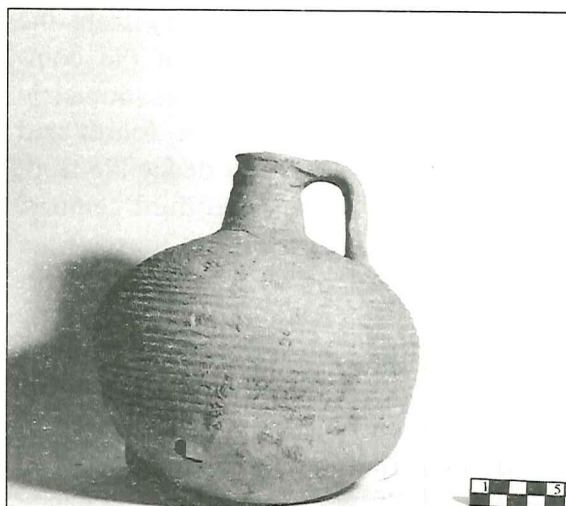


14. Nabataean common ware pot with bowl as lid.

pot; above the rim there were none. It seems likely that the pot had been half full of liquid when it was placed in the corner with the bowl on top of it and that the liquid subsequently evaporated. Although the pot appeared to have been deliberately and carefully placed in the above mentioned corner there was no recognisable trace of a floor at that level.

Until the 1994 campaign we had assumed that the Nabataean settlement on both the upper and lower terrace had been destroyed at the beginning of the second century AD and that a resettlement of the area only occurred at the beginning of the fourth century. We had no evidence for settlement continuity during the second and third century.

Towards the end of the 1994 campaign we uncovered some new structures in square 116/H on the lower terrace. The pottery we found there suddenly changed the whole picture. The range of pottery was surprising because there was far more common ware than fine ware present. Up until now it was usual in the early phase to find two-thirds more Nabataean fine ware than common ware pottery. There were a few common ware bowl sherds with roughly



15. Nabataean common ware jug.

painted decoration on the inner surface but the patterns are still clearly dependent on the decoration of the fine ware. Many of the rim forms are similar to those of the first century/beginning of the second century AD but the profiles are less sharply formed, more rounded. The walls of the cooking pots are thicker than those of the first and beginning of the second century AD - as thick as they are in the Late Roman period. The colour of the slip changed from white to yellow-beige and is liberally applied. A typical example of this pottery is a jug with a horizontally striated rim (Fig. 15). A large proportion of the rims and pottery fabrics found are similar to forms and fabrics we know better from the fourth and fifth centuries AD but are more finely made; other typical forms of cooking pots and bowls from the fourth century are not represented. Taking all this into consideration we conclude that this pottery was produced after the beginning of the second century AD and before AD 300. A detailed description of the forms and decoration represented will be published in the Acts of the Congress on Byzantine and Proto-Islamic Pottery in Syria-Jordan which took place in December 1994 in Amman.<sup>46</sup>

46. Colloquium : "Byzantine and Early Islamic Ceramics in Syria-Jordan (IVth-VIIIth Centuries"

'Ammān, 3-5 December 1994 (forthcoming in BAH).

The newly discovered pottery from the lower terrace demonstrates that the common ware forms found in the domestic quarter on az-Zanṭūr from the fourth and fifth century AD are clearly deducible from the forms of the second and third century. Some forms are even related to those of the first century AD.

### Restoration and Consolidation

The restoration project, planned in 1991, could, after two failed attempts, at last be carried out during the 1994 campaign. The first step taken was general maintenance work of the whole site including the careful cleaning of the ruins. The first main task in the conservation and restoration work was on the walls and in the rooms of the houses. The walls are all of local sandstone, occasionally also of limestone and practically only in dry stone wall-technique. All walls were restored in the same manner. The damaged top layer of stones was removed and carefully cleaned. It was then reconstructed in its original form using similar blocks from the debris to replace missing ones. In order to protect the original walls, which remained dry stone walls after the renovation, the top layers were built up by at least one extra row of stones and levelled. The additional stone layer was stabilised with a lime-mortar and the upper face was sealed. The mortar was mixed with local sand so that it is hardly visible. Finally the wall surfaces were consolidated with silicid acid ester and made water resistant with Silan. Broken blocks, especially those from the doorposts and columns etc. were restored with EP-mortar.

The second main task was the conservation of the flagging. Whenever it was possible the sandstone flagging was treated *in situ*. After the upper surfaces had been cleaned the joints were carefully cleared out with spatulae and then washed out with wa-

ter. The second stage of work was the stabilisation of the paving bed under the flagstones. This was achieved by first washing the whole bed out with water and then spraying very diluted lime mixed with a little white cement under the flagstones. Afterwards the joints were refilled with a lime-mortar. The floors thus treated were watered and covered with plastic for several days afterwards to prevent them from drying out too quickly. After the drying process was finished surface cracks in the flagstones were filled with PMMA resin-injections. The final stage in the restoration of the stone floors was the stabilisation of the sandstone with silicid acid ester and waterproofing with Silan.

The pavement in Room XVII<sup>47</sup> required special attention. The floor had been covered with hexagonal limestone flags which were only partially conserved; many of the flags were lying loose on the surface. It was under this floor that the archaeologists wished to lay a trench. This required that the whole floor covering and the original lime mortar bedding be removed. The original position of most of the loose flags could be established, after they had been cleaned, from the negative imprints in the mortar bedding. They could thus be integrated in the general plan. A layout plan was then drawn on a waterproof paper on a scale of 1:1. The paper was laid out outside the room and the numbered stones were placed in their correct position on the plan. The flagstones were preserved with silicid acid ester and the cracks were fixed with EP-mortar. When the sounding had been completed the 3 m deep trench was refilled and the fill was settled with water. A new bed was laid consisting of lime, white cement and sand and the stones were relaid. Any missing parts were refilled with mortar (as a neutral 'retouch') and finally they were waterproofed with Silan. The remains of

47. Campaign 1993: Fig. 1.

the north-western façade of the Nabataean house were partially collapsed and partially dangerously unstable. The most dangerous parts of rooms 13, 16, 17 and 22 were deconstructed at the top and then reconstructed in a less dangerous manner. At the same time stone drainage channels were built in the parts of the house where the debris was piled up to reduce the water pressure after heavy rain. The remaining parts of the façade were propped up with a supporting terrace of quarry stones at a right angle to the wall. This supporting structure was then covered with sand and now looks like a natural part of the landscape. On the lower terrace which has only been excavated in the last three years specific safety and conservation measures were taken. This work was concerned mainly with individual stretches of walls, supporting arches and stone-flagged floors.

The urgently necessary consolidation of the walls of the Nabataean house on the lower terrace is planned in one of the future campaigns. The large stone-flagged floor could already be completely restored in 1994.

#### Archéobotanique (Table 1; Fig. 16)

Durant la campagne de fouilles 1994, plus de 250 kg de sédiments archéologiques ont été tamisés, afin de retrouver un maximum de restes végétaux: bois, charbons, fruits et graines. Les échantillons, de 1 à 5 kg environ, ont été prélevés à différents endroits du site. Les plus riches en restes botaniques sont bien sûr liés aux activités humaines, fours de cuisson ou zones de déchets. Ils ont été tamisés à sec, dans une colonne de tamis de 6, 3, 2 et 0.5 mm de diamètre. Les refus de tamis ont été triés dans leur totalité, à l'exception du plus fin, qui, pour des raisons de temps, n'a été que partiellement observé.

Plus de 2200 paléosemences carbonisées

ont été décomptées; seule une centaine d'entre elles n'étaient pas brûlées. Les graines sont assez mal conservées et les critères morphologiques d'identification manquent souvent. Les sédiments analysés sont essentiellement nabatéens. Ils proviennent de 18 FK différents, dont 2 sont des fours (*tābūn* terrasse inf. 1993; *tābūn* FK 1119; Fig. 7).

Les premiers résultats d'analyses sont reportés à la Table 1. (Résultats bruts provenant de quantités diverses de sédiments; une évaluation du nombre de macrorestes par unité de poids, pour comparer les échantillons entre eux, est reportée à plus tard.). Trois échantillons datent de l'époque romaine. Ces données de terrain sont encore partielles. Elles seront complétées à Zurich (EPF), car une collection de comparaison s'avère indispensable pour une identification plus poussée des paléosemences.

#### Premiers résultats

Les fruits et graines retrouvées sont surtout des plantes de cultures: céréales, légumineuses et fruits.

##### 1. Céréales

Les céréales forment le 21% environ des semences carbonisées identifiées à Petra. L'orge (*Hordeum vulgare*) est beaucoup plus abondante que le blé (*Triticum sp.*). De nombreux grains restent cependant à identifier (*Cerealia*).

L'orge est l'une des plus anciennes céréales cultivées. Elle résiste mieux que le blé à la sécheresse et se développe bien même sur des sols pauvres. Dans l'ancien monde, elle était la céréale la plus fréquemment utilisée pour la fabrication de la bière.<sup>48</sup> Les 3 grains germés retrouvés à az-Zanṭūr en seraient-ils témoins (Fig. 16:a,b,c)? Cette espèce servait également de fourrage aux animaux domestiques.

##### 2. Légumineuses

Elles ne composent que le 2% du total

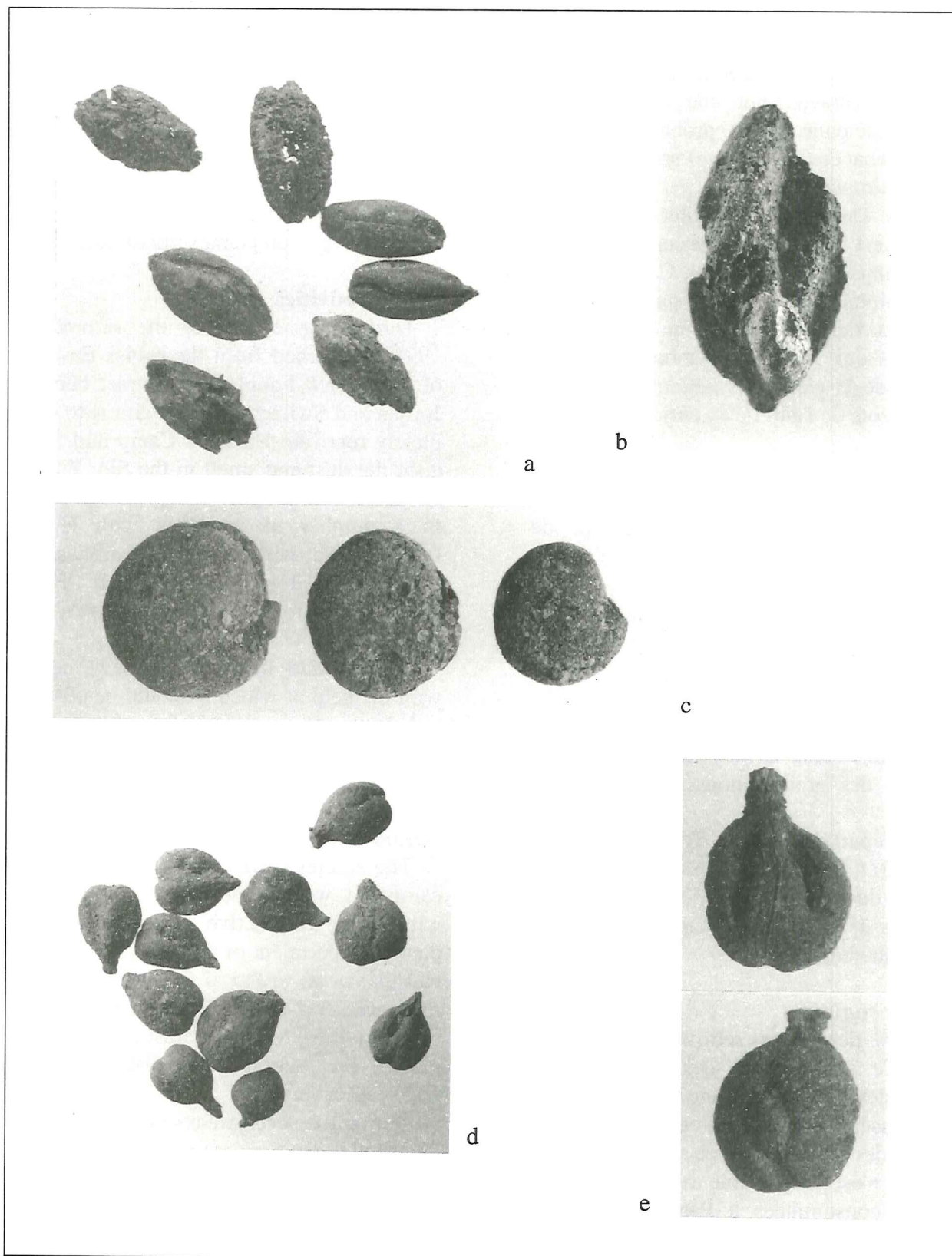
48. D. Zohary et M. Hopf, *Domestication of Plants in the Old World* (Oxford, 1994).

Table 1. Premiers résultats d'analyses.

Espèces	Ancien nab. (FK 587)	Nab. (diff. FK)	Nab. Taboun ter. inf. (1993)	Nab Taboun (FK 1119) (1994)	Total (entiers + fragm.)	Ro. tar- dif
<b>Plantes de cultures</b>						
<b>Céréales</b>						
Hordeum vulgare, orge	148/12	13	16		189	
grain germé	2		1		3	
cf. Hordeum vulgare	1/5	3	12	8/1	30	
Triticum sp., blé	2		22		24	
Cerealia, céréales	21/7		25/44	21/21	139	
cf. Cerealia	/33	3/8	/5		49	
<b>Légumineuses</b>						
Lens culinaris, lentille				1	1	
cf. Lens culinaris	16/1		3		20	
Fabaceae (cf. Pisum, pois)	3		6		9	
cf. Fabaceae (cf. Lens/Pisum)	5/1			/5	11	1
<b>Fruits</b>						
cf. Ficus carica, figuier	4		12		16	
Olea europaea, olivier	3/34	3/15	2/46	/86	189	3
cf. Olea europaea	1/13			1	15	
Phoenix dactylifera, dattier		2/1			3	1
cf. Phoenix dactylifera	/1	/2	/1		4	
Vitis sp.	7/3	11/3	18/4	936/296	1278	
cf. Vitis sp.				/8	8	
<b>Plantes sauvages</b>						
cf. Brassicaceae	1	1			2	
Caryophyllaceae		/1	3		4	
cf. Cyperaceae	1				1	
cf. Fabaceae		1			1	
Galium sp., gaillet			4		4	
cf. Hordeum sp., orge	11/8				19	
Plantago sp., plantain		3			3	
Poaceae			60	18	78	
cf. Poaceae			1		1	
Indéterminées	4/39	20/5	16	14/16	114	
Bourgeons		1			1	
Charbons	14	10	10	26	60	
<b>Plantes sauvages non carb.</b>						
Asteraceae			/1		1	
Buglossoides sp.		1	3/1		5	
Indéterminées		7/12	23	1	43	
Oeufs: coquilles			/41	/1	42	

Légende: 1er chiffre = nombre entier; / = fragment





16 . a. Orge (*Hordeum vulgare*). Echelle 5:1.  
b. Grain germé. Echelle 10:1.  
c. Lentilles (*Lens culinaris*). Echelle 8:1.

d. Pépins de raisin (*Vitis sp.*). Echelle 4:1.  
e. Pépin de raisin. Echelle 10:1.

des graines identifiées et sont représentées par la lentille (*Lens culinaris*; Fig. 16:c). Cette dernière se rencontre surtout dans le FK 587, caractérisant une époque nabatéenne ancienne. Il est probable que certaines Fabacées (*Fabaceae*) soient des pois (*Pisum sativum*).

Dans l'agriculture méditerranéenne, la lentille est une compagne caractéristique des champs d'orge et de blé. Comme toutes les légumineuses, elle joue par ailleurs un rôle important dans le système cultural. Les bactéries qui vivent en symbiose dans les racines de la plante permettent en effet de fixer l'azote de l'air et d'en enrichir le sol.

### 3. Fruits

Dans nos échantillons, les fruits forment le 72% du total des semences avec quatre espèces. C'est le plus ancien groupe de plantes cultivées connues dans l'ancien monde.<sup>49</sup>

Le raisin (*Vitis sp.*) domine avec 1278 pépins, retrouvés toutefois en majorité dans le *tābūn* fouillé cette année (FK 1119; Figs. 7,16:d,e). Les pépins, souvent presque ronds, n'ont pas une forme typique de la vigne cultivée. Mais seule la moyenne des mesures précises des graines nous renseignera là-dessus.

La plupart des noyaux d'olives sont fragmentés (*Olea europaea*, 189 restes) et proviennent du même *tābūn*. Dattes (*Phoenix dactylifera*) et figues (*Ficus carica*) sont peu fréquentes.

### Plantes sauvages

Le 5% des plantes retrouvées sont sauvages. Ce sont surtout des plantes compagnes des cultures qui, une fois identifiées, nous renseigneront sur les conditions écologiques des champs. A ce stade de notre étude, il n'est pas possible d'affirmer que les plantes consommées à Petra étaient par-

tiellement cultivées dans la ville, aux alentours du site ou importées. Il est de plus certain que l'alimentation végétale ne se limitait pas aux seules espèces citées plus haut. Les légumes par exemple, comme le poireau, l'ail ou l'oignon, ont été retrouvés dans des sites plus anciens du Proche-Orient, de même que différents condiments, fruits sauvages ou plantes tinctoriales.

### Other Activities

During the course of the summer of 1994 we learned from the Swiss Embassy of an expired liquidation contract between Jordan and Switzerland. The aim is to completely renovate Nazzal's Camp and to reduce the dust and smell in the Siq. We followed up both projects during the campaign. In a number of meetings with H.R.H. Prince Ra'ad, with the Swiss Ambassador Dr. G.F. Pedotti and with Mr. Nasri Atalla both projects were extensively discussed.

U. Bellwald developed a new method with the help of which it should be possible to bind the dust so that in future neither the visitors to Petra nor the cliff faces will have to suffer under the unpleasant situation.

### Acknowledgments

The studies carried out during our sixth campaign would not have been possible without the very active support of the Jordanian Department of Antiquities. Our special thanks go to Faisal Qudah, Acting Director-General of the Jordanian Department of Antiquities, for his interest and help during the preparation and realisation of this sixth campaign.

During the seven weeks of excavation in Petra Suleiman Farajat was again the representative of the Jordanian Department of Antiquities. He assisted us in every way

49. D. Zohary et P. Spiegel-Roy, 'Beginnings of fruit growing in the old World', *Science* 187, 1975: 887-894. L.E. Stager, 'First fruits of civili-

zation', Pp. 172-187 in J.N. Tubb (ed.) *Palestine in the Bronze and Iron Age: papers in honour of Olga Tufnell* (London, 1985).

during our stay and was an irreplaceable help in Petra. His constant kindness was a basic requirement for the success of our work. The local authorities, especially Ottallah Alabesät, Governor of Wādi Mūsā, were always ready to facilitate our work.

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