

# TOWARDS A HISTORY OF PRE-ROMAN POMPEII: EXCAVATIONS BENEATH THE HOUSE OF AMARANTUS (I.9.11–12), 1995–8

## INTRODUCTION

The early history and urban development of Pompeii have been discussed continuously for over a century. The difficulty of reaching agreement or firm conclusions is a product of the paradox of Pompeian archaeology: the unique quality of the preservation of the final destruction level of AD 79 has presented a constant impediment to the exploration of the earlier levels, from which any dependable account of urban development must be derived. If the present deliberate attempt, on however small a scale, to explore such levels brings new results, it is because, when our information is so fragmentary, each new fragment will bring surprises. In this paper we offer the results of five seasons' excavation (1995–8) below a pair of houses in the southeastern quarter of Pompeii (I.9.11–12): our focus is on the evidence for habitation at levels below the foundations of the houses that stood in AD 79, which we date to the first century BC (Fulford and Wallace Hadrill, 1998a; 1998b) (Fig. 1). A subsequent study will be concerned with the rich sequence of occupation and building between the first century BC and the destruction of AD 79. The implications of this first part of our final report are sufficient to modify significantly the current picture of the development of the city. Yet it is still premature to imagine that we are in a position to understand the history of the city as a whole.

Analysis of Pompeii's urban development has depended on three methodologies. The first is the chronological analysis of standing structures, particularly of construction materials and techniques, and of decorative systems. This approach was first employed in the 1870s, when the unification of Italy and the transference of management of the site from the kingdom of Naples to the new state opened it up to international scholarly debate. Fiorelli's *Relazione* (1873) broached an issue seemingly untouched by his predecessors in attempting to relate the striking variety of building techniques to the scanty information known from the literary sources on the city's history, and particularly to Strabo's account of the four waves of political dominance, from Oscan to Etruscan to Samnite to Roman (*Geography* 5.4.8). Fiorelli suggested a neat fit of principal building materials and political dominance: the use of Sarno limestone coinciding with the Etruscans, tufa with the Samnites, lava, brick etc. with the Romans. The same decade saw the debate move on rapidly. In a thorough and perceptive account of building techniques, Nissen (1877) demonstrated that at the least Fiorelli's succession

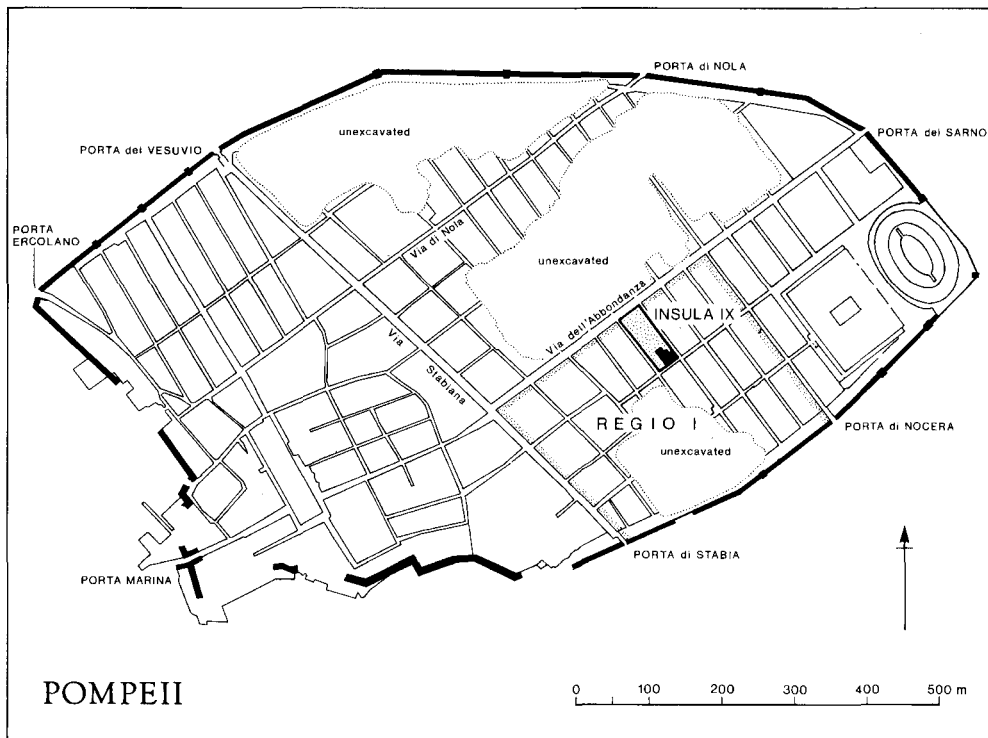


FIG. 1. Plan of Pompeii showing location of I.9.11–12.

required radical modification, since different materials, especially limestone and tufa, were used simultaneously for different functions within a single building. Mau produced a book-length rebuttal (1879) of Nissen, conceding many of his points, but reaffirming the Fiorelli framework of a succession of materials; and he added to the debate his distinctive contribution of a chronology distinguishable in four styles of mural decoration. Mau subsequently held firm to the Fiorelli faith, if modifying his chronology. The Etruscans were still responsible for the start of the 'limestone' period, with its houses based on the 'Tuscan' atrium; and the fact that 'Kalksteinatrien' were distributed right across the city, respecting the final street-plan, demonstrated that the whole street-plan was laid out in an Etruscan 'new foundation' (1908: 36–7). But he brought the use of limestone down to the Samnite period, correctly observing that the tufa period could have started only in the Hellenistic phase of the city between the end of the Hannibalic War and the Social War. Modification of these schemes and their chronology is continuous in a subsequent century of literature on building techniques and (especially) decorative styles, but the framework for the discussion is that set by the 1870s.

The second approach has been to read the city's history from its street-plan. Fiorelli and Mau, fixated with 'Kalksteinatrien', concluded that the entire plan went back to a single original scheme. It was Haverfield in 1913, writing about ancient town planning in general, who observed that this could not be right (1913: 63–8). The layout was much too complex, with a variety of different schemes and orientations, to be the product of a single plan. Specifically, he observed the traces of what should be an old nucleus in the irregular streets of the southwestern quarter. His observations were taken up by von Gerkan, working on Miletus and the impact of Hippodamean planning, briefly (1924) and at length (1940). The complexity of Pompeii's layout continued to attract those interested in ancient city layouts. The existence or otherwise of an 'Altstadt' has remained controversial. Eschebach's study (1970) was a solid gain in offering the first (more or less) reliable plan of the site with complete house listings, though his own new theories about the 'Altstadt' met some scepticism (Ward-Perkins, 1979; Richardson, 1982). The debate continues, but too many telling observations can be made both about overall alignments in the planning of specific zones, and about significant discrepancies and incompatibilities between different zones, to justify jettisoning this methodology and returning to a pre-Haverfield homogeneous plan (De Caro, 1992).

The third methodology is stratigraphic investigation, and its late entry into the debate and its limited extent have meant that its impact has not been felt fully until recently, and that it must operate in the context of deeply-ingrained assumptions derived from non-stratigraphic approaches. Its lack was noted by Haverfield (1913: 63), reiterated forcefully by Carrington (1932: 5), who noted that the consequence of examining the growth of the town without stratigraphic evidence was that the discussion was 'a little unreal'; the same lack was still lamented half a century later by Ward-Perkins (1984: 29). That substantial progress had, in fact, been made in the interim was due to Maiuri, who squarely appreciated the essential role of excavation of the 'sottosuolo' for any understanding of historical development. The principle, already articulated by him in the 1920s, led to a series of excavations between 1926 and 1942, which shed fundamental light on three areas (Maiuri, 1973). The first was private housing, starting with the excavation of the atrium of the Casa del Chirurgo, which demonstrated that this 'limestone atrium' belonged at the earliest to the third century BC. Similar investigations of other houses revealed repeatedly that beneath the floors of existing houses, often of limestone, were foundations of earlier houses, many of the soft local volcanic tuffoid called *pappamonte*, which appeared to be of archaic date. Secondly, excavations around the two apparently early temples, that of Apollo on the Forum and the 'Doric' Temple of Minerva/Hercules on the Triangular Forum, revealed substantial deposits of votives dating back to the sixth century BC. Thirdly, examina-

tion of the circuit of the walls led to an understanding of the sequence of fortifications; and though insufficient associated material emerged to provide clear dating of the various phases, an important indication of the antiquity of the circuit was the discovery at various points of an earlier wall of *pappamonte*.

Maiuri's work was interrupted, in many senses, by the war. His postwar work was a return to the worst tradition of superficial disinterment down to the AD 79 level, driven by an agenda of tourism, not scholarly investigation; his stratigraphic work dried up. When interest in historic development revived in the 1970s, it took its starting-point from Maiuri's work. So it is De Caro's publication (1986) of Maiuri's unpublished material from the Temple of Apollo that puts a significant sixth-century presence in Pompeii beyond doubt; it is further investigation of the wall-circuit by Chiaramonte Treré (1986) and by De Caro (1985) that confirms a sixth-century date with a mid-Corinthian horizon for the first *pappamonte* wall; and it is excavation of atria, by Bonghi Jovino (1984) and Chiaramonte Treré (1990), and by D'Ambrosio and De Caro (1989), that has led to a growing conviction that very little, if any, of the domestic structures standing in Pompeii could date to before the third century, and probably in large part to the end of the Hannibalic War (Chiaramonte Treré, 1990).

The result of the 'new wave' of excavations in the subsoil has been to generate a quandary. On the one hand, a sixth-century early phase of the city, including its two key temples and the full later circuit of walls, has been confirmed, so that Strabo's talk of Oscans and Etruscans is far from implausible. On the other, most of the 'Samnite' period seems to have evaporated, leaving most of the town visible today built in a wave of prosperity following Roman imperial expansion from 200 BC onwards. The currently favoured solution is to employ a variant on the 'Altstadt' hypothesis, which sees the sixth-century city concentrated in its southwestern core, while the larger circuit of walls served to protect an extensive agricultural area. On this account, it is only in the third century that the whole expansion of housing begins into the northwestern quarter (Region VI) and the entire area east of the Via Stabiana, though this is already complete before the arrival of the Sullan colonists in 80 BC.

The most important conclusion of the excavations here reported is that, while emphatically confirming the down-dating of visible remains, including 'limestone' construction, there seems to be a continuity of habitation on the same alignment of roads back to the sixth century, even in the eastern quarter of the city.



## THE EXCAVATION (MF, AC)

### INTRODUCTION

The focus of the work undertaken in I.9.11–12 since 1995 and reported here has been on the excavation to the subsoil of the atrium court of house 12 and the adjacent garden of house 11 (the areas known as 12.2 and 11.5) (Fig. 2). Within the two areas, which amount to 170 m<sup>2</sup>, have emerged some traces of prehistoric activity and evidence of an organized settlement from the mid to late sixth century BC. The history of the existing houses, however, cannot be traced with confidence further back than the later first century BC. This account, however, reports on the evidence of the earlier, pre-house and pre-Roman occupation.

While both areas excavated to the subsoil have been disturbed to a greater or lesser extent by the later activity, the quality of survival of the earliest settlement is relatively good in the atrium court of house 12. The extent of later pit-digging is such that no contexts necessarily earlier than the fourth century have been preserved in house 11. Both areas have produced evidence of a worked volcanic soil through which much of the succeeding occupation has been cut (below, pp. 43–4). The dark, sandy character of this loam makes the recognition of slight features such as small pits and post-holes which are filled with similar material extremely difficult. All features which cut the natural subsoil, including the limits of those which relate to the two standing buildings, as well as the remains of all early walls, are recorded on Figures 5, 10 and 14, below. The archaeology reported here extends from a consideration of features which pre-date the worked soil down to those associated with the construction of house 12 and with pits and structural features which date from the early first century BC onwards.

The sequence described here has been established by a combination of stratigraphic analysis and a consideration of associated dating evidence, most notably pottery. Reference to the latter has been particularly important in assigning different dates to features which share the same stratigraphic horizon, that is isolated, negative features which appear to cut through the worked soil and are ultimately sealed by make-ups associated with the construction of the later houses. The evidence from house 12 has been subdivided into a series of fifteen *context groups* (including the subsoil), some of which, on the basis of the pottery (below, pp. 62–79), are broadly contemporary. Separation into discrete *context groups* has been determined on the basis of their character and interpretation. Thus *context group* 3 (= lava-filled construction trenches) is, on the basis of the pottery, approximately contemporary with *context group* 6 (= miscellaneous negative features). On the other hand, *context group* 7 (= miscellaneous features) is distinguished from *context groups* 6 and 8 (also = miscellaneous features) only on the basis of the associated pottery; in terms of the stratigraphic sequence, all three groups are contemporary.

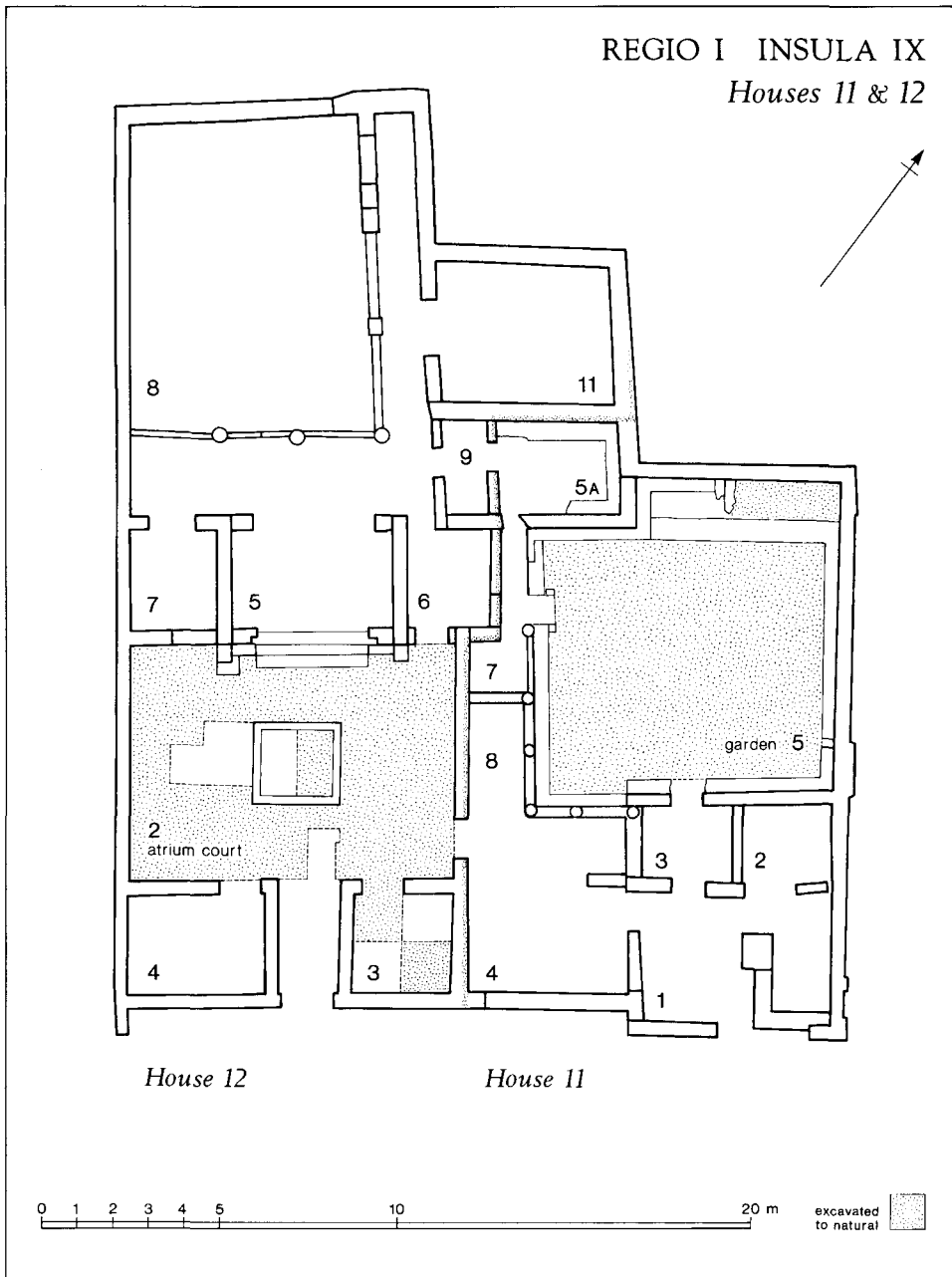


FIG. 2. Plan of I.9.11–12 showing areas excavated to the subsoil (stippled).

**House 12 context groups**

0. The natural subsoil.
1. Features cut into the natural subsoil below *context group 2*.
2. The worked soil.
3. Features cut into the worked soil (2): the archaic lava-filled construction trenches.
4. Features cut into the worked soil (2): the southern group of post-pits.
5. Features cut into the worked soil (2): southwest pit 335.
6. Features cut into the worked soil (2): miscellaneous archaic.
7. Features cut into the worked soil (2): miscellaneous fourth-third centuries BC.
8. Features cut into the worked soil (2): miscellaneous undated.
9. Contexts sealing *context group 3*.
10. Contexts cut into the worked soil: cutting *context group 9*.
11. Contexts cut into worked soil (2): second-first centuries BC.
12. Features cut into the uppermost fills of pit 335 (*context group 5*).
13. Contexts sealing uppermost fills of pit 335 (*context group 5*).
14. Primary make-ups for house 12 sealing *context groups 3–13*.

As can be seen, extensive stratigraphic relationships are relatively limited. In the northwest quadrant of the atrium court we can define a sequence of *context groups*: 0–1–2–3–9–10–14, while in the southwest a sequence 0–2–5–12–13–14 has been established. Elsewhere, more limited relationships, such as 0–2–6–14, have been recognized. Taking account of these sequences and the limited evidence of dating from the pottery (below, p. 63), the following groupings emerge among those context groups which are later than the worked soil (*context group 2*). First, on the basis of association with, in particular, bucchero and a sixth-century Attic black-glazed sherd, we can link *context groups 3, 6 and 9* (= Pottery Group A). The second group is defined on the basis of associations with probable south Italian black-glazed wares and a wider range of other ceramics and includes *context groups 4, 5 and 7* (= Pottery Group B). A number of negative features which contained no finds (*context group 8*) probably belongs to one or other of the above groups. The final association is of the remaining *context groups 10–14*, which are either stratigraphically later than other *context groups*, or, as in the case of 11, contain pottery, such as Campana A, which is datable to after *c.* 200 BC (= Pottery Group C). However, despite its stratigraphic position, study of the pottery from *context group 10* suggests the latter may be more appropriately assigned to Pottery Group B.

**House 11 context groups**

In the case of house 11 the identification of early occupation and structures has been determined largely on the basis of associated finds and the rela-

tionship of the contexts with the natural subsoil. With the exception of a number of small, negative features, the remaining evidence of early activity has been cut by contexts of the first century BC and first century AD.

100. Natural subsoil.

101. Quarry pit cut into the natural subsoil (678).

102. Unmortared *pappamonte* and limestone wall fragments.

103. Features cut into the natural subsoil: miscellaneous fourth–third centuries BC.

With the exception of those features sealed by the wall fragments of *context group* 102, no relationships could be established between the groups of pre-house/pre-Roman contexts described in this report. Despite the presence of residual, archaic material, such pottery evidence that we have suggests that it may belong to the middle, fourth- to third-century, phase identified in house 12. It is therefore all considered as part of Pottery Group B.

## PREHISTORIC ACTIVITY (*CONTEXT GROUPS 1 AND 2*)

There is limited evidence of prehistoric activity. While we cannot preclude the possibility of some having been dug from a higher level, a number of small pits and post-holes were only recognized after the excavation of the overlying soil (below, Fig. 5). Those where we can be certain of their stratigraphic context include a group of four small pits (371, 372, 376, 417) sealed by the linear features 344 and 378 of mid to late sixth-century date. Unfortunately neither these, nor any of the adjacent features, produced associated finds. Indeed, with the exception of post-hole 60, which contained a decorated sherd of iron age pottery of eighth-/seventh-century date, and post-hole 364, which produced a sherd of probable sixth-century pottery, none of the features only observed at the level of the natural, volcanic subsoil contained datable material. In addition to the limited stratigraphic evidence, we should note the not inconsiderable quantities of residual prehistoric pottery (cf. below, Table 1).

## THE GEOARCHAEOLOGICAL CONTEXT (MR)

### *Introduction*

The town of Pompeii is situated on volcanic ash derived from prehistoric eruptions of Vesuvius. Given the long period of activity on the site of houses 11 and 12, it is not surprising that nowhere on the site did a full profile of the pre-occupation soil survive. However, the truncated base of this palaeosol was discovered in a few places in house 12 and it was possible to cut a section through the underlying deposits to inspect the upper part of the geological sequence. This study was limited to houses 11, 12 and also 10, where

the pre-occupation palaeosol had been exposed in the trenches of the University of Naples excavation, with the aim of providing a background against which to set development in houses 11 and 12, rather than to provide a sequence for Pompeii as a whole.

### Methods

A geological section 1.65 m deep was created by cutting back the edge of pit 678 (house 11). The sequence was described and a series of samples was subjected to particle size analysis in an optical granulometer by Dr A. Parker of the Oxford University School of Geography. The results are shown in Figure 3. The size classes used are <0.002 mm clay, 0.002–0.048 mm silt, 0.048–2.000 mm sand. Sections were also examined below house 12.2, where there was evidence of early cultivation, and in house 10. Selective subsamples of 1 kg were sieved to 0.5 mm for mollusc shells.

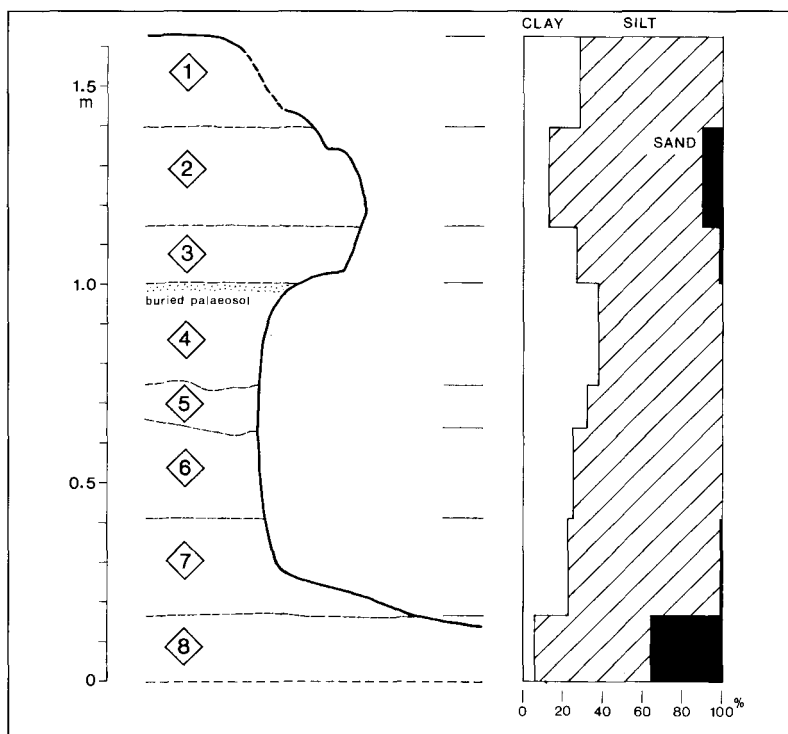


FIG. 3. The geological section of pit 678 in I.9.11.5.

### Descriptive interpretation

The geological section below 11.5 showed a sequence of ash deposits (Fig. 3). The lowest two, ⑧ and ⑦, were very weathered and were probably Pleistocene in date. The series above them, ⑥, ⑤ and ④, showed soil devel-

opment at the top, ④ being a very dark brown fine silty clay loam comparable with the andosol described in 12.3 (Macphail, 1998). This had in turn been buried by more ash, ② and ①, pale grey silt loam in which the fine particles were loosely aggregated to give a gritty texture. The last major pre-AD 79 eruption of Vesuvius was the 'Avellino' eruption of  $3760 \pm 70$  BP, which left pyroclastic and phreatoplinian deposits largely to the north and east of the volcano (Santacroce, 1987; Rolandi *et al.*, 1993). However, there are more recent pyroclastic deposits and it is possible that the ash was from one of them. The ash appeared relatively unweathered and the prehistoric soil which developed from it had been lost as a result of later activity. However, the truncated A horizon of this soil, an andosol, survived on other parts of the site, including 12.3 and 12.2 (context 064) and in house 10. It was characterized by its very dark brown to almost black colour and its high silt content. This soil was not sufficiently calcareous for mollusc shells to survive.

The topography of the site had been altered by later terracing but the prehistoric soil surface would have sloped to the southeast. The base of the soil was uneven, with a drop of 0.25 m over less than 1.0 m being noted in house 10. This suggests that the ash had been gullied by rainwater before it became vegetated and soil formation occurred. It is uncertain whether any levelling for cultivation took place before the settlement was founded. The topography of Insula 9 showed some evidence of terracing half-way down, but it is uncertain whether this was Roman or earlier.

The pre-Roman settlement activity resulted in the soil of the site becoming sufficiently calcareous for the preservation of mollusc shells. This change appears at least in part to have been effected by the importation of freshwater alluvial sediment. Shells of freshwater molluscs, in addition to terrestrial molluscs, were present in many of the samples floated for charred plant remains, including some from the earliest archaeological features. *Planorbis planorbis*, a species found in a variety of freshwater habitats, was identified from beneath house 12.2, context 381, the *context group 2* worked soil. Aquatic species including *Bithynia* sp., a flowing-water mollusc, were present in house 12.2, contexts 333, 329 and 328, a *context group 5* pit sequence. When these species were recorded from the Roman garden soil of the peristyle (5) of house 11.5, it was suggested that alluvium had been included in soil imported to raise the level of the garden (Robinson, 1998), which may indeed have been correct. However, this seems implausible for the early settlement. Another possibility is that alluvial clay was brought to the site for use in wattle and daub construction.

The particle size analysis of the deposits cut by pit 678 under the garden of house 11 showed that it had been dug down to the top of a more sandy deposit than those it cut. The pit was also undercut beneath another ash layer which contained some sand. The overall shape of the pit is highly suggestive that its purpose was to quarry deposits with a high clay content, perhaps for construction purposes.



The top of the prehistoric andosol beneath house 12.2 (context 64) had been mixed with overlying deposits by cultivation (Fig. 4). There was similar evidence for cultivation of overlying deposits truncating the andosol in house 10. The asymmetric undercut nature of the cultivation marks was characteristic of spade or mould-board plough cultivation. Unfortunately, they were not found over an area large enough to be exposed in plan. The cultivated soil (house 12.2, context 49) was a calcareous grey-brown silt loam. It contained much occupation debris and imported material including shells of freshwater molluscs, for example *Bithynia leachii*, and fragments of Sarno limestone. It is uncertain whether the evidence from house 12.2 belonged to the same episode of cultivation as that in house 10. The events need represent no more than very small-scale spade horticulture within the settlement, as certainly occurred at a later date, and do not imply a major change of use of the site.

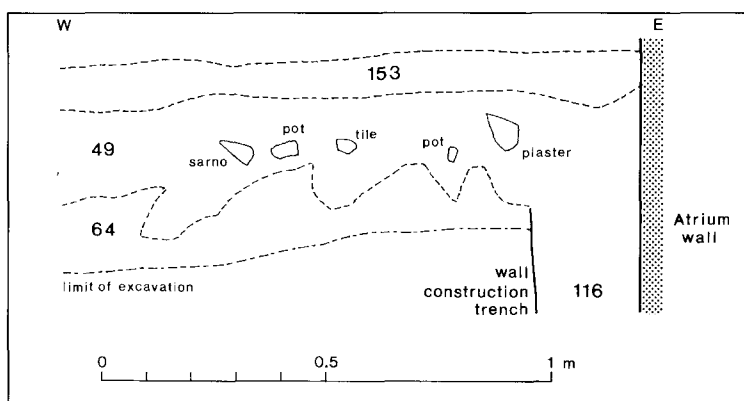


FIG. 4. Asymmetric cultivation marks in partial, east-west, profile across the atrium court of I.9.12.2.

## THE EXCAVATION — THE SIXTH-FIFTH CENTURIES BC (MF, AC)

(Context groups 3, 6 and 9; Pottery Group A) (Figs 5–8)

Two substantial and linked features can be assigned to the mid to late sixth century (context group 3) (Figs 5–8). On the north–south–east–west orientation shared by the later house 12 is a pair of parallel slots, with evidence of an east–west link to form an H-shaped arrangement (344, 378). Within the area excavated these slots are cut by late first-century BC pits. While the northern limit of these features lies beneath the tablinum or peristyle of the later house, a southern, rounded end to the eastern slot was clearly defined. Each of these is flat-bottomed with vertical sides and measures *c.* 0.7–0.96 m in width and *c.* 0.2 m in depth. All were found to be completely and tightly

packed with pieces of lava with dimensions no greater than *c.* 0.14 m, and generally less than 0.1 m (Figs 6–8). When revealed by excavation, this fill presented an even, horizontal, upper surface. The internal width between the slots is just over 5.0 m so that, if they represented three sides of a room, the minimum internal dimensions of the latter would be *c.* 4.0 × 5.0 m. The volcanic material was sealed by a light grey-brown sandy soil with frequent inclusions of crushed white plaster, which in places had a hard, *terra battuto*-

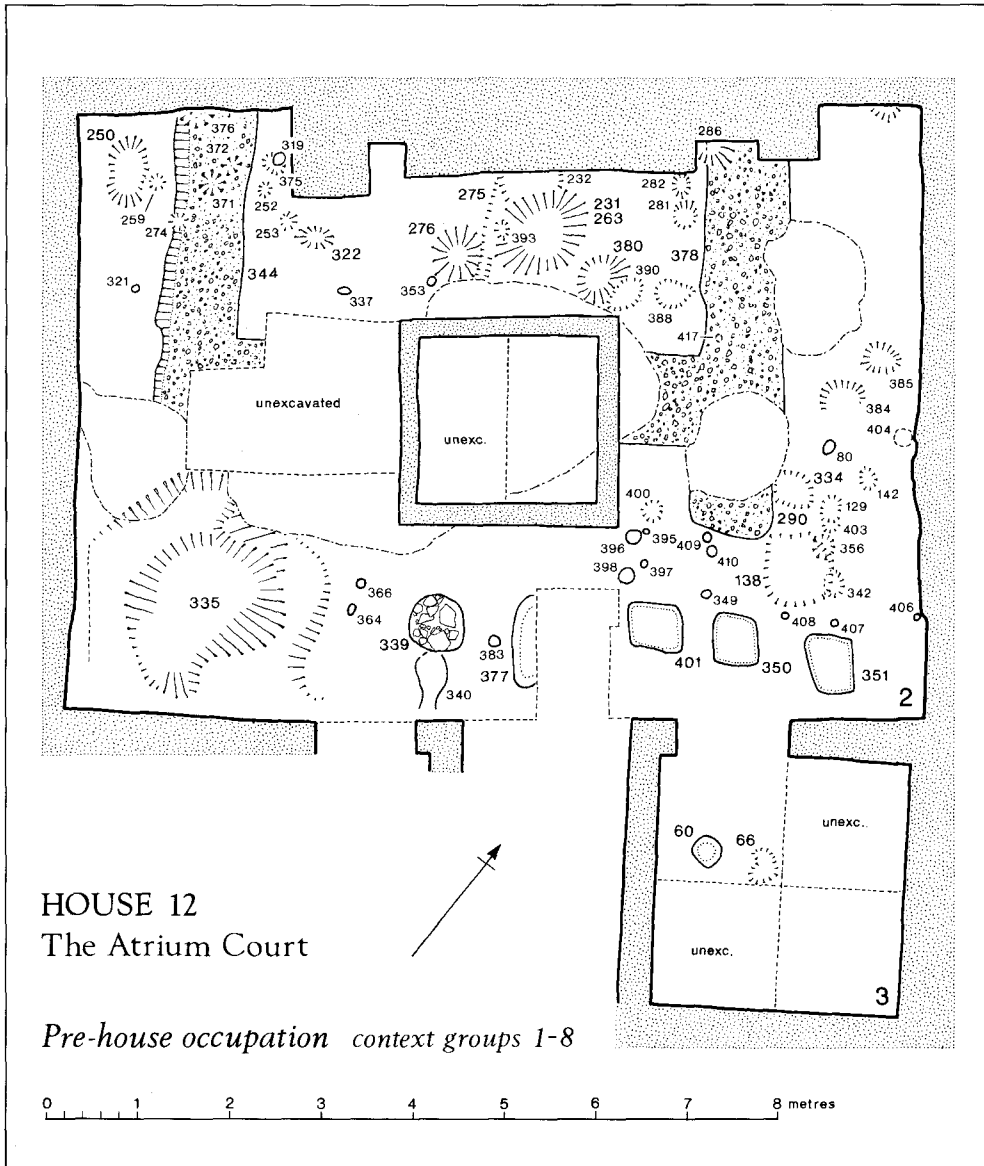


FIG. 5. House 12.2: pre-house occupation (1).



FIG. 6. Lava-filled slot (344) in 12.2 (north to right).



FIG. 7. Lava-filled slot (378) in 12.2 (north to left).





FIG. 8. Slot 378 after excavation showing profile (left) (north to left).

like surface (324, 336 = *context group 9*). This was particularly well preserved to the east, where it incorporated fragments of *pappamonte* blocks between the eastern slot (378) and the construction trench of the atrium wall of the later house 12. Pottery from the fill of these slots and from the immediately overlying contexts was closely similar and includes a range of mid to late sixth-century material including bucchero, a fragment of an Attic black-glazed lip cup, datable to the middle or third quarter of the sixth century, painted vessels and amphorae (below, and Fig. 16.18). A small pit (266 = *context group 10*, Fig. 14 below), measuring *c.* 1.0 × 0.7 m and with a depth of *c.* 0.3 m, cut 324, which sealed the western trench. It contained pottery probably datable between the sixth and the fourth centuries.

There are no parallels known from Pompeii to aid us in interpreting the function of these crushed lava-filled slots, but we suggest that they were intended to serve as foundation trenches for a building of timber-framed or mud-brick construction. It is also possible that courses of unmortared stone blocks similar to those of later date in the garden area of house 11 were set upon these foundations. Given that the nature of their fill is such that they would have been well drained, it is perhaps more likely that they supported a mud-brick construction. This would provide a context for the alluvial clay imported to the site and present from *context group 2* (above, p. 46).

A few other shallow pits and post-holes (*context group 6*) can be assigned to this period.

## THE FIFTH/FOURTH–THIRD/SECOND CENTURIES BC

(*Context groups* 4, 5 and 7 (8); Pottery Group B) (Figs 9–13)

**House 12**

Apart from the material culture associated with the contexts sealing the lava-filled construction slots, there is no further evidence that can be associated securely with the structure described above. Indeed, with the exception of some residual sherds from later in the sequence, there are no contexts with material which can be assigned with confidence to the fifth century BC. Although there are considerable problems in establishing the chronology, as will be discussed later, it is probably not until the fourth or fourth–third centuries that we detect evidence of renewed activity. In house 12 this comprises a series of large post-pits which run along the south side of the atrium court (*context group* 4) and a wide, but relatively shallow, pit in the southwest corner (*context group* 5). Several fragments of walls of unmortared blocks of *pappamonte* and Sarno stone, sharing the same orientation as the walls of the later house (*context group* 102), and a large, bell-shaped quarry pit have been recorded in the garden area of house 11 (*context group* 101). A lack of closely datable imports or Italian black-glazed wares precludes a very refined chronology (see below, pp. 66–75).

Five post-pits (339, 377, 401, 350, 351) run along the inside face of the south wall of the later atrium court (Figs 5 and 9). The pits are variously sub-rectangular, oval and round in plan with dimensions of *c.* 0.5 × 0.6 m and with depths of between 0.4 and 0.6 m. The uppermost fill of 339 consisted of a packed arrangement of large pieces of *pappamonte* with dimensions of 0.25 m, and smaller fragments of Sarno (0.2 m). Spacings between pits range between 0.4 and 0.5 m. Evidence for possible additional posts has been found next to 339 (340) and 350 (349). It is possible that these post-pits represent the remains of the northern wall of a structure. The dating of this group of post-pits is particularly problematic (below, p. 67) and a sixth-century date cannot be excluded. They have been assigned a later date because of the presence of coarse-ware sherds (for example, Fig. 17.24) not otherwise securely associated with sixth-century material.

A large, irregular-shaped pit (335), approximately 2.0 m in diameter and *c.* 0.4 m in depth, below the level of the worked soil, occupied the south-western corner of the later atrium court. This was filled with a series of slow silts and tips which contained a pottery assemblage of fourth-/third-century date (below, Fig. 17). A dark greyish brown to brown silty sand with some charcoal (330) was overlaid by lenses of a very dark greyish brown clayey sand containing degraded Sarno stone, ranging from a coarse sand to pieces of *c.* 50–70 mm (330/269, 333, 329, 345, 328, 331/270, 315, 271). The abundance of the degraded Sarno stone increased significantly in the upper

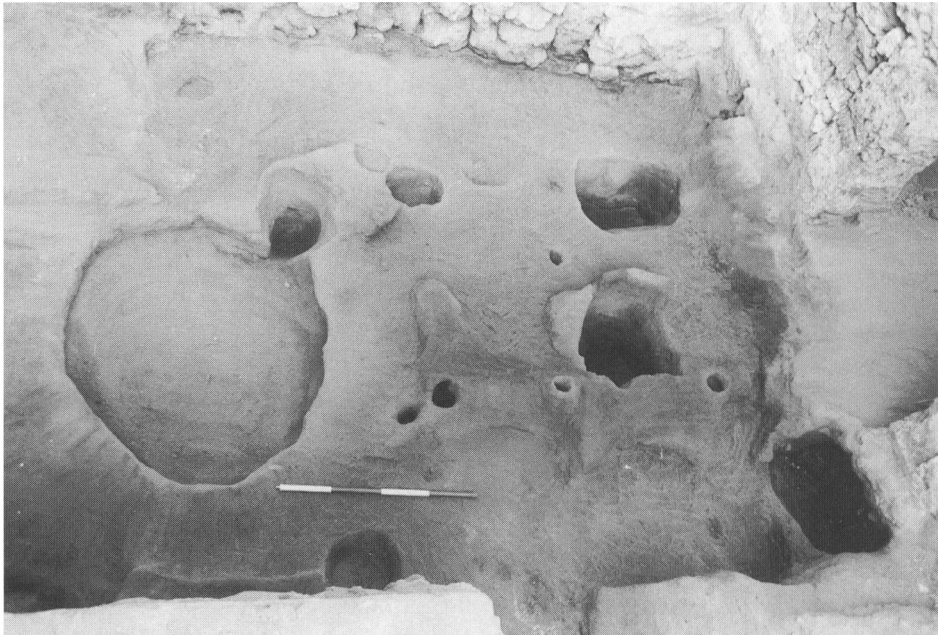


FIG. 9. Southeast corner of atrium court (12.2) after excavation to the subsoil. Post pits 351 and 350 (*context group 4*) are visible (top right).

contexts (301, 239, 227). The presence of the stone, which was a distinctive feature of the fill of this pit, may be accounted for by building activity in the immediate vicinity.

A few other post-holes and small pits also contained pottery assemblages of this date (*context group 7*). However one imagines the arrangement of the structure (or structures) which occupied the area of the later atrium court, it seems highly probable that, assuming some degree of contemporaneity, pit 335 was an external feature to it (or them). A sufficient space exists between the latter pit and the westernmost post-pit 339 to be certain that the row did not continue further to the west.

Amongst other features assigned to *context group 7* we should note a kidney-shaped pit (231) in the northern part of the excavated area. It contained eight miniature votive vessels (*microceramiche*) (below, Fig. 18) as well as other, possibly residual, pottery. It measured  $1.0 \times 0.7$  m, with a depth of 0.3 m, and was filled with a soft, friable, yellowish brown, silty sand, abundant charcoal and charred plant remains, burnt and unburnt animal and fish bone, and small pieces of Sarno stone. It was cut by pit 232, measuring at least  $0.7 \times 0.35$  m, which also contained a fine yellowish brown sandy fill with abundant charcoal and charred plant remains, as well as some burnt and unburnt bone. Associated with this pit is a bronze coin of Ebusus of the second century BC. While certainly pre-dating the construction of house 12, the



*microceramiche* in pit 231 cannot be more closely dated than between the fourth and the mid-second centuries BC. Its central position in relation to the tablinum of the later, standing house, the foundations of which partly sealed the later pit 232, may be significant. A further votive deposit containing at least one *microceramica* vessel was found (but not excavated) in the side of the wall-trench immediately beneath the south wall of the pseudo-impluvium. Limited excavation revealed a context rich in charcoal and other charred plant remains.

Adjacent to pit 231 was a linear slot (275),  $1.14 \times 0.16$  m, with a depth of 0.07–0.13 m, filled with a grey, clayey silt. Oriented north–south, it followed the natural slope downwards to the south. The character and arrangement of this feature have no other parallel within the excavated area. It contained little pottery and has been assigned provisionally to *context group 7* on the basis that there is no certain evidence to assign it an earlier date, but the latter cannot be precluded. On the west side of the excavated area was pit 104/113/272, which was cut by a later (Roman) pit (215). The former was filled with a yellowish brown clayey sand, abundant charcoal, pieces of Sarno stone and occasional pieces of grey lava.

### **House 11 (Figs 10–13)**

In the garden area of house 11 the earliest feature (*context group 101*), probably pre-dating the walls, is the large, bell-shaped pit (678) to the north (Figs 10–11). It measured *c.* 2.25 m in diameter, swelling out a further 0.8 m towards the bottom, with a depth of 1.5 m. It was filled with grey sandy volcanic soil which contained a small assemblage of fourth-/third-century pottery with important residual material of archaic date, including an Etruscan graffito scratched on a black-glazed amphora sherd (pp. 75, 82–4). The pit cuts down through a band of a sticky, clay-like soil whose extraction may have been its *raison d'être*, thus accounting for the distinctive profile. Although there is no stratigraphic relationship with the adjacent walls, it is likely that the pit provided materials for the building of the associated structure(s).

The wall fragments can now be described. A characteristic shared by all is the absence of mortar and the presence of earlier, negative features beneath. With one exception, all are of single-block width. It is very probable that these foundations served to carry a timber-framed, plaster or mud-brick superstructure. To the northeast is an east–west alignment (438) lying just inside the northern boundary of the later house (Fig. 12). It was built of *pappamonte* blocks as well as reused ceramic building material and the surviving stretch measures *c.*  $2.1 \times 0.55$  m in width. To the east it is cut by a later toilet, while to the west it is cut by a pit. The surviving blocks of *pappamonte* measure  $0.42 \times 0.55 \times 0.25$  m, and  $0.3 \times 0.25 \times 0.22$  m. The blocks sit in the upper, dark sandy loam fill of a vertical-sided and flat-bottomed trench with a depth of 0.3 m below the base of the *pappamonte*, whose upper surface is

flush with the level of the natural subsoil to the north. A secondary wall (451) on a north–south alignment butts up against the *pappamonte* structure, and is mortared to it on the south side. It is of rubble construction, incorporating pieces of Sarno and other material, and measures  $1.0 \times 0.3$  m. A possible construction trench for this wall was also identified in section.

Some 2.9 m to the south is a slighter foundation on an east–west alignment. It was composed of a mixture of pottery, including dolia (below, Fig. 19.88–9), ceramic building materials and stone (480), which filled its con-

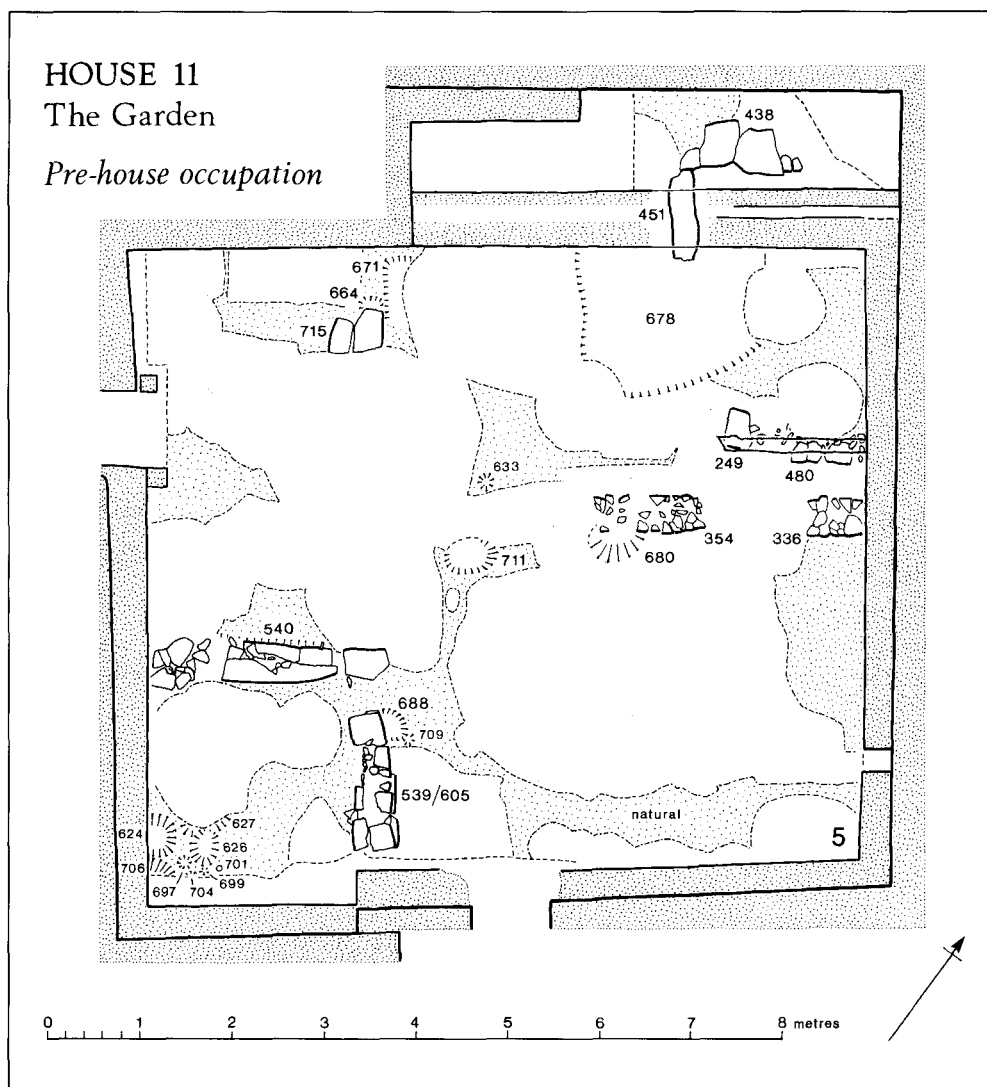


FIG. 10. House 11.5: early walls and other early pits and post-holes.



FIG. 11. House 11.5: general view from northeast to southwest corner. Pit 678 is in the foreground; walls 540 and 539/605 in the background; 715 at centre right.

struction trench, and carried a wall of mud-brick (249) (Fig. 12). This wall could be traced *c.* 1.6 m west from the east wall of the later house where it was cut by an early Imperial pit. Its northern edge was cut by a pit which contained a late second-/early first-century BC pottery assemblage, thus providing a *terminus ante quem* for its robbing.

On the west side of the excavated area are three fragments of walling (Fig. 11). To the north two blocks of *pappamonte* side by side suggest a north-south wall (715) which corresponds with that of a more substantial foundation of *pappamonte* and Sarno limestone blocks to the south (539/605). There are traces of this wall continuing under the later bench to the north, where two further *pappamonte* blocks were noted in the section. The blocks of 715 measure  $0.45 \times 0.31 \times 0.3$  m, and  $0.26 \times 0.37 \times 0.16$  m, giving a total width for the wall of 0.6 m. The upper surfaces of the blocks





FIG. 12. House 11.5: northeast corner from the east; showing walls 480 (centre foreground) and 438 (right).



FIG. 13. House 11.5: view of east elevation of early wall 539/605 from the later pit 487. *Pappamonte* beneath Sarno blocks.

are flush with the natural, but the trench which contains them is no deeper than their height. Traces were recorded of a small, underlying pit (664) cut by the larger pit on the east side. The former contained a fragment of wall-plaster painted with a green stripe and with traces of a raised edge suggestive of the First Style. A further pit (671) is closely associated with this fragment of walling (715) and possibly cut by it. The north and west edges of this pit are sharp and near vertical; the south edge slopes gently towards the base. The greatest depth of pit 671 is 0.55 m and it was filled with a grey-brown silty sand containing less than five per cent fragments of wall-plaster and charcoal.

The related fragment (539/605) to the south consists of the remains of three courses of stone blocks (a lower course of *pappamonte* and two upper courses of Sarno) and measures 2.2 m in length by 0.4 m in width (Fig. 13). One *pappamonte* block, measuring  $0.7 \times 0.4 \times 0.2$  m, survives of the base. It is overlaid by blocks of Sarno and pieces of lava no more than 0.21 m in length, 0.33 m in width and 0.23 m in height. Further, larger blocks of *pappamonte* (0.3–0.4 m long by 0.17–0.22 m wide by 0.15–0.32 m high) to the south appear to lie in a construction trench, which cuts a pit (688) with a diameter of *c.* 0.4 m and a depth of 0.41 m. The latter was filled with grey-brown, fine clayey silt with patches of compacted plaster and frequent small to medium stones. This pit in turn cuts a small, circular post-hole (709), *c.* 0.2 m in diameter and 0.1 m deep, filled with a fine, loose, grey silty sand. This wall is cut by an early Imperial pit to the north, while it is partly undermined by a late Republican pit on the southeast side. It would appear to continue beneath the later bench.

At right angles and butting up against it is a fragment of Sarno stone wall (540), which is also cut by late Republican and early Imperial pits. This stretch of wall measures 2.0 m in length by 0.43 m in width by 0.45 m in height, and its south face is covered by white plaster. The stub of a secondary mortared wall was observed to be attached to the south face. The main wall may continue westwards under the later bench. Individual blocks of limestone measure 0.45–0.7 m in length by 0.2–0.23 m in width, with a height of 0.3–0.45 m, and are set within a construction trench. Pottery was recovered from among the blocks making up the wall and from a shallow, underlying pit filled with small stone-rubble. It provides a *terminus post quem* for the construction (below, pp. 75–5).

Although the majority of these wall fragments is cut by features dating no earlier than the mid-first century BC, the robbing out of the associated structure could have been as early as the end of the second/beginning of the first centuries BC (the date of pit 510, which cuts wall 480). Such is the intensity of pit-digging from the mid-first century BC that no occupation can be associated with these wall fragments. Equally, if there were contemporary rubbish pits, these, too, have been destroyed by the later activity. While we

assume that these fragments of wall belong to phases of the same building, we cannot be certain of this. Establishing a *terminus post quem* for these walls is extremely problematic. Two walls incorporate reused ceramic building material (cf. Fig. 19.88–9), as well as reused blocks of Sarno and *pappamonte* of varying sizes. There is almost no datable pottery from contexts earlier than the wall fragments, but a piece of possible First Style wall-plaster was found beneath one wall fragment, and other plaster fragments were recovered from pre-wall features. On this basis, a date earlier than the beginning of the fourth century is extremely unlikely, but we cannot preclude some or all of the fragments dating as late as the second century BC. The contrast with the evidence from house 12, where almost no evidence of earlier wall alignments later than the lava-filled construction trenches has been recovered, is striking. The only comparable evidence is associated with *context group* 11 (below, pp. 60–1).

A number of miscellaneous small pits and post-holes also have been assigned to this period (*context group* 103). There is a particular concentration in the southwest corner of the excavated area (624, 706, 697, 704, 699, 701, 626, 627). None of these exceeds a diameter or depth of *c.* 0.5 m. Most contained fills with charcoal and small fragments of Sarno stone, the latter perhaps derived from earlier structures in the vicinity. Given the extent of later disturbance, and the undeniable presence of sixth-/fifth-century pottery in later features such as pit 678, we should not underestimate the amount of early activity in this area.

## LATER OCCUPATION BEFORE THE CONSTRUCTION OF HOUSE 12

(*Context groups* 10–14; Pottery Group C) (Figs 14–15)

The foundation trenches of house 12 cut through a spread of occupation material or make-up which sealed a number of features representing continuing activity down to the construction of house 12 in the later first century BC. Among the principal features was a sub-circular pit (216) (*context group* 12), which was cut by the west wall of house 12, but appeared to cut the uppermost fills of pit 335 (Fig. 5). It measured 1.0 by at least 1.2 m, with a depth of 0.6 m, and was filled with a soft, fine dark grey-brown sand with charcoal flecks, becoming clayey towards the bottom together with abundant small pieces of Sarno stone. Although there was a significant residual element, the pottery suggests a fourth-/third-century date. Probably somewhat later, but still pre-dating the construction of the house was a small, possibly ritual, pit in the southwest corner (206 = *context group* 12), which contained a yellowish brown sandy fill with small pieces of Sarno, charcoal, and burnt and unburnt bones of pig. It measured



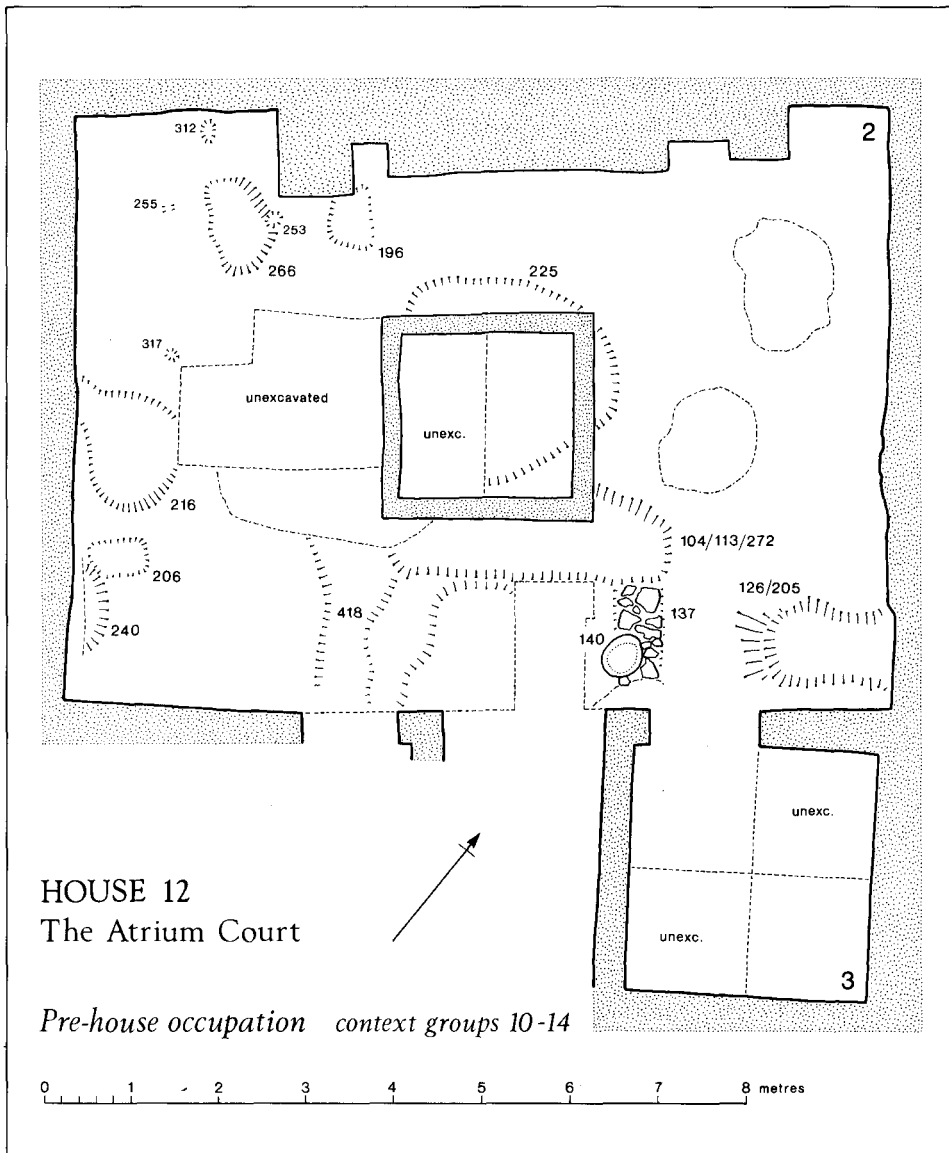


FIG. 14. House 12.2: pre-house occupation (2).

0.4 × 0.65 m, with a depth of 0.2 m. Close by was pit 240 (= *context group* 12), which also cut through the uppermost fills of pit 335. It was semicircular in plan, but cut away to the west by the foundation trench for the west wall of house 12. It was filled with a friable, coarse sand containing some fragments of Sarno stone and plaster.

In the southeast quarter of the atrium court were two significant structural features which were finally filled in the second–first centuries BC (*context group 11*). A sub-rectangular pit (126/205) occupied the southeast corner. It measured  $1.4 \times 0.6\text{--}1.0$  m, with a depth of *c.* 0.3 m, and was filled with a grey-brown sandy soil. Immediately adjacent to the west is an L-shaped trench (104/113/272) with steeply sloping sides and a flat bottom. It was filled with a dark brown, clayey loam containing pottery of second-/first-century BC date. In the section oriented north–south was an arrangement of packed, irregular-shaped blocks of Sarno stone (137) which was cut by a post-pit (140) and the construction trench of the east wall of the *fauces* of house 12 (Fig. 15). The east–west section was cut by a later pit, but could not have



FIG. 15. House 12.2: fragment of unmortared wall-footings 137 in southeast corner of atrium court.

extended any further to the west. Evidence for a return on the west side, to correspond with 137 on the east, is provided by a shallow cut (418). A *terminus post quem* for the initial phase of construction is provided by the underlying post-pits described above (339, 377, 401, 350, 351 = *context group 4*; Fig. 5) whose final filling would appear to be of fourth-/third-century or, possibly, earlier date. A *terminus ante quem* is provided by the construction of house 12 in the later first century BC. Little sense can be made of the surviving remains, but it should be noted that, on the east, the original structure extended south on the line occupied by the later wall of the *fauces*.

An important question which arises from the presence of the underlying post-holes is whether there is structural continuity from the fifth/fourth-third centuries down to the construction of house 12 in the later first century BC. A puzzling feature of the sequence from the atrium court of house 12 is the absence of early stone walls. We have noted from the area of the garden in house 11 that soil- or rubble-filled features underlie certain stretches of early wall of unmortared *pappamonte* and limestone blocks. Is it possible that the trenches of *context group 11* (below, Fig. 25) beneath the atrium court, including the section packed with limestone rubble (137), originally supported similar walls of unmortared stone blocks? In this respect it is important to recall that, although there was no trace of a feature to correspond precisely with 137 (except, possibly, 418), overlying the rubble-packed post-pit (317) to the north of the west wall of the *fauces* was a linear arrangement of small pieces of limestone. If we accept a degree of variation in foundation arrangements of the early, unmortared walls, we may hypothesize a robbed-out wall of such a kind in the atrium court of house 12. This allows us to reconstruct an east–west wall to the north of the north wall of the later room 3 which then turns north to create an inverted U-shaped ‘re-entrant’ (126/205, 137, 113/272, ?418). Sufficient evidence survives to envisage a second return to the south to align with the west wall of the *fauces*. It has been suggested already that further elements of early wall have been ‘consumed’ by later foundations. The absence of any other features, which might have served as foundations for early walls within the atrium court, suggests a further correspondence with some of the walls of the later house 12. How close that correspondence might have been cannot be established with any certainty, although we can be confident that, in respect of the entrance at least, local arrangements were different.

The latest deposits consisted of a series of levelling dumps in the southwest quarter which sealed the uppermost fills of pit 335 (= *context group 13*; Figs 5 and 25). These, in turn, were sealed by further extensive spreads (= *context group 14*) across the excavated area. Both sets of deposits were cut by the foundation trenches of house 12.

## THE POTTERY (JT)

Since little pre-Roman pottery has been published from Pompeii, it is important to set out a full record of what has been recovered from beneath houses 11 and 12. While there is a greater understanding of the chronology and sources of imported Greek fine-wares and amphorae, as well as bucchero, less is known of the associated locally-made cooking and domestic wares from the archaic period onwards. There is also much to be learned about the chronology and sources of Campanian and south Italian Hellenistic black-glazed wares, particularly the plain forms. Outside the framework provided by well-dated categories such as imported Greek pottery and bucchero, there is much uncertainty. Thus the aim of this report is to present the material in detail by the broad groupings of *context groups* outlined above (pp. 41–4) to show the associations between the various categories of pottery in the expectation of further modifications to the chronology in the future. Within the broad groupings there is further refinement, where appropriate, to include the assignment to *context group* of individual sherds. The quantitative approach also allows a consideration of the changing relative abundance of the various categories of pottery in each group. This methodology complements approaches which have placed the emphasis on classification by ware groups (cf. Bonghi Jovino, 1984) rather than on the associations of material according to stratigraphic context (cf. De Caro, 1985).

The pre-house occupation levels in house 12 yielded an assemblage of some 2,267 sherds of pottery weighing 29,316 g, to which can be added a further 316 sherds (9,941 g), from below house 11, of which 141 sherds (3,549 g) came from a large pit (678).

## METHODOLOGY

The material was divided by ware into broad categories: fine-wares (table-wares), amphorae, amphorae/jugs, dolia and coarse-wares. Each of these was further subdivided into either recognized named types, or groups sharing similar fabric characteristics in terms of the composition, size and frequency of inclusions. Considerable difficulty was encountered in discriminating between certain categories, for example between amphora body-sherds and those of jug, particularly with the local Campanian fabrics and the buff fabrics; consequently these categories are defined fairly crudely.

The sherds were sorted macroscopically context by context, mainly in the field during the excavation seasons. Record drawings were made of a selection of sherds as they were processed. No petrological work has been carried out on the defined fabric groups. The fabrics and forms were quantified by sherd count, weight and estimated vessel equivalence: the data are summar-

ized on an Excel spreadsheet which forms part of the site archive. The lamps are the subject of a separate report (below, pp. 79–80). The context numbers of individual, illustrated sherds are given in brackets in the catalogue which follows.

## CONDITION

The assemblage as a whole was of mixed condition with a variable average sherd size across the phased groups. This ranged from 7–9 g for material from the worked soil (*context group* 2) and from features cut into the worked soil (*context groups* 4, 6 and 7), to 15–16 g for material from the construction trenches (*context group* 3) and the later groups (*context group* 11). The best-preserved material in terms of sherd size came from pit 678 below house 11, with an average size of 24.6 g. This is perhaps the only feature from the complete sequence which could be construed as having a typical rubbish deposit relating to one event. The absence of complete vessels or joining sherds and the presence of archaic material suggest that even this group is not primary and has been redeposited from another source, perhaps a midden.

A small number of possible prehistoric sherds throughout the early levels, along with sherds of bucchero and other archaic material from the later levels, also indicates a certain level of disturbance and redeposition throughout. Due to the complexities of the site, the interpretation of the stratigraphic sequence has to a certain extent been reconstructed from the presence of certain types of fine-ware pottery acting as chronological markers. The smallness of many of the groups and the limited number of such fine-wares have prevented close dating of the sequence. For the purposes of this report the pottery from the pre-house levels has been divided into three broad chronological groups (Table 1<sup>1</sup>): (A) pottery dating to the sixth/fifth centuries BC, which includes material from features cut into the natural, the worked soil, the construction trenches and horizons sealing the construction trenches (below, Fig. 16); (B) pottery dating to between the fifth/fourth and second centuries BC from other features cut into the worked soil (below, Figs 17–20); and (C) pottery dating to the second–first centuries BC from features cut into the worked soils, including contexts sealing those of group B and deposits from the primary make-ups prior to the construction of House 12 (below, Figs 21–2).

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<sup>1</sup> All tables are at the end of the paper (pp. 127–44).



## GROUP A (*CONTEXT GROUPS 1–3, 6 AND 9*) — SIXTH/FIFTH CENTURIES BC

The stratigraphically earliest activity on the site identified from features cut into natural yielded a single sherd of coarse-ware pottery from post-hole 364. Coarse-wares with a brown or red-brown to black fabric containing many inclusions suggestive of a local source had a long production period spanning many centuries and consequently the dating of a single sherd is impossible.

The worked soil sealing these features yielded a fairly good assemblage of some 149 sherds (1,310 g). This comprises by sherd count 30% fine-ware, 50% coarse-ware, 12% amphora, 5% amphora/jug and 3% probable prehistoric material. The fine-wares include eleven sherds of bucchero (Fig. 16.1–4), mainly small bowls/dishes and a kantharos. The bowls can be paralleled by examples from Caere (Pandolfini, 1992: types E41, E50, who cited further parallels from the cemetery at San Giovenale and the settlements at Veii, Gravisca and Rome). All the vessels appear to be types current in the sixth to early fifth centuries. Other fine-wares found in association with the bucchero and, therefore, potentially of similar date include five sherds of a black-glazed ware with a pale yellow-orange fabric, all from context 198 (Fig. 16.5–7), polychrome painted ware (Fig. 16.8), buff fine-ware (Fig. 16.9–11), a colour-coated buff ware (context 130) and coarse-ware including one with a band of painted decoration (Fig. 16.12–14). The possible date range of the latter wares is not so clearly defined as the bucchero, and in some cases it may extend beyond the sixth–fifth centuries.

The lava-filled construction slots produced eleven sherds (172 g), comprising one amphora body-herd in a dark orange fabric with fine white inclusions, nine of coarse-ware and one pale brown limestone-tempered ware. No fine-wares were recovered.

A further 70 sherds (711 g) were recovered from contexts sealing the lava-filled construction slots. Fine-wares include a further eighteen sherds of bucchero with ten sherds from closed forms, the remainder from dishes or cups (Fig. 16.15–17), an Attic ware lip cup (Fig. 16.18), buff wares, painted wares (Fig. 16.19) and a single sherd of black-glazed ware. Also amongst the group were fine, buff or cream amphorae and several coarse-wares (for example, Fig. 16.20–1). An amphora sherd crudely fashioned into a counter was also present (Fig. 16.22).

Possible prehistoric sherds account for 1.5% by count of the group. Amongst these is a small piece with an impressed, double-concentric-ring decoration from post-hole 60 (Fig. 5). Similar sherds have been noted elsewhere in eighth-century contexts. Prehistoric pottery has been noted elsewhere in Pompeii, for example from the 1974 excavations at the House of Marcus Lucretius Fronto (Wynia, 1982), and two sherds from excavations in the area of the temenos of the Temple of Venus (Arthur, 1986: 31, areas 11–12).



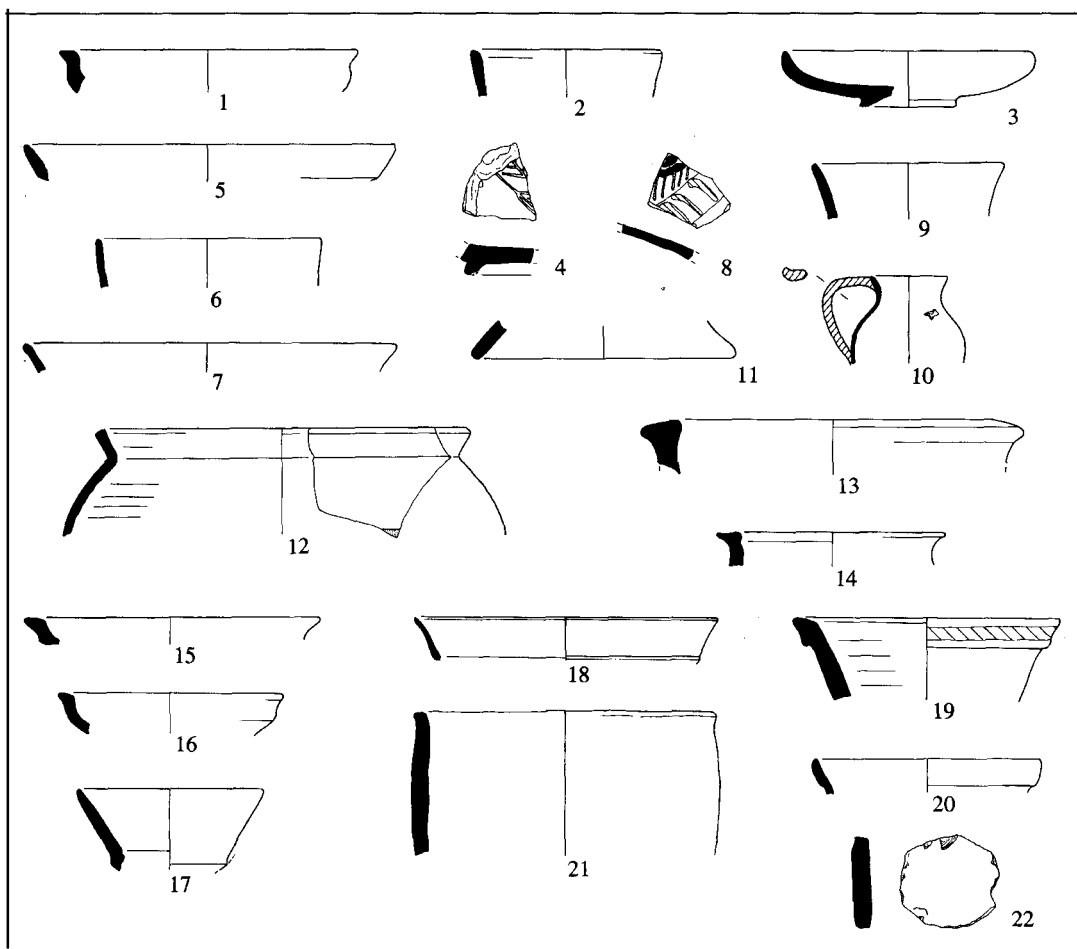


FIG. 16. Pottery Group A: nos. 1-22. Scale 1:4.

***Illustrated sherds: Group A, context groups 1-3 and 9 (Fig. 16)***

*Features cut into the worked soil*

1. Bucchero carinated bowl (130). Cf. Rasmussen (1979) carinated bowl type 1; Caere (Pandolfini (1992) type E41). First half of the sixth century.
2. Bucchero ?kantharos (130) (cf. Caere — Pandolfini (1992) type E20-1) or cup/beaker (cf. Rasmussen, 1979: pl. 29, type 4c; pl. 41, 256A). Sixth-early fifth centuries.
3. Small bucchero curved wall dish (130). Cf. Rasmussen (1979), type 1, pl. 41.257-9; Caere (Pandolfini (1992) type E50). Sixth-fifth centuries.
4. Base-sherd from a bucchero dish with a foot-ring (130). A graffito has been scratched into the surface. Similar designs have been noted on other bucchero vessels from Pompeii and Vico Equense, for example, *CIE* II.2, nos. 8762, 8765, 8789, 8798 and 8800; De Caro, 1986: tav LX.350; LIX.334.
5. Black-glazed platter (130). Pale yellowish orange paste.

6. Small black-glazed bowl/cup (198). Pale yellow-orange fine paste with a glossy black surface.
7. Black-glazed dish (198). Pale yellowish orange paste with a black, slightly metallic surface slip.
8. Body-herd from an open form with internal painted decoration comprising black zones partially superimposed by thin white diagonal lines (230). Below this is a thinly applied orange band with dark brown 'commas'. Fine buff fabric.
9. Plain fine buff cup (130). The exterior wall has some linear scrape marks made before firing.
10. Small single-handled jug in a fine buff ware (230). Part of a small applied piece of clay may be part of an applied motif or an accidental fragment of clay fired to the vessel.
11. Small conical coarse-ware lid (130).
12. Wide-mouthed jar with short everted rim (198). Light grey granular coarse-ware fabric with an orange-red core. Decorated with a band of white paint around the upper girth.
13. Coarse-ware bowl (198). Cf. D'Ambrosio (1994), tomb 3, no. 2, inv. 40751, fig. 12; tomb 2, no. 2, inv. 40522, fig. 6.
14. Coarse-ware jar (344); orange-brown exterior and core, black interior.

*Contexts sealing lava-filled construction trenches*

15. Bucchero carinated bowl (324). Cf. Rasmussen (1979) carinated bowl type 1; Pandolfini (1992) type E41. First half of the sixth century.
16. Small bucchero carinated dish (304). Cf. Rasmussen (1979), pl. 41, 248–50 dated first half sixth century.
17. Bucchero kantharos (304). Cf. Rasmussen (1979), kantharos 3h dated *c.* 575–500 BC; Albore-Livardie (1979), tav 65.1, type 4B.
18. Attic ware lip cup (324). Very fine internal black polished surface. The exterior is mid-orange with black horizontal lines at the rim and carination. Cf. Sparkes and Talcott (1970), form 384, dated *c.* 550–540 BC.
19. Closed vessel in a buff fabric with coarse argillaceous inclusions (336). The outer rim is decorated with a slightly irregular band of dark brown paint. Cf. Caere (Santoro (1992b), type 1–2, figs 326–7, dated from the end of the seventh century (700–650 BC)).
20. Coarse-ware jar with a lenticular rim (336). Hard, orange granular fabric with a grey core.
21. Handmade coarse-ware jar with a greyish white exterior, red-orange/grey core and mid-grey interior (336). Slightly uneven, wheel-turned rim. Cf. Bonghi Jovino (1984), tav. 103.3, residually from a context dated from the second half of the second century BC to first century AD.
22. Crudely fashioned counter (303), made from a sherd of amphora in a cream, finely micaceous fabric.

**GROUP B (CONTEXT GROUPS 4, 5, 7 AND 10) —  
FIFTH/FOURTH–SECOND CENTURIES BC (FIGS 17–20)**

Contexts broadly dating between the fifth/fourth and second centuries BC from below house 12 produced 757 sherds (8,642 g) of pottery. A significant proportion of this came from pit 335, with some 340 sherds (2,731 g) from

the lower fills and a further 203 sherds (4,017 g) from the upper fills (301, 227, 187).

The lower fills of pit 335 yielded a diverse range of pottery comprising 15% fine-ware, 62% coarse-ware and 22% amphora/jug. Two sherds of dolium were recorded along with several fragments of degraded brick/tile. The fine-wares suggest a certain level of redeposition or active curation of fine-wares with fifteen sherds of bucchero dating to the sixth–fifth centuries. A single sherd of painted Gnathian ware (Fig. 17.29) from context 328 suggests a *terminus post quem* of c. 350 BC for this horizon. Also present are fourteen sherds of black-glazed wares with a buff paste and a further seven sherds with a slightly darker, orange paste. Two buff-painted sherds are present from contexts 315 and 331, one with brownish orange painted bands, the other with red painted bands. A few sherds of black-sand amphora suggest active local production.

The upper fills of pit 335 produced a slightly different complement of wares. Sherd joins between contexts 187, 227 and 301 and a range of similar wares suggest likely contemporaneity of fill. The assemblage composition is similar to the lower fills of the pit with 15% fine-ware, 56% coarse-ware and 27% amphora/jug. The fine-wares include far less bucchero, with just two pieces, but commensurately more black-glazed ware, 21 sherds in total with a variety of pastes, including at least four Campanian A sherds and one Campanian B. Eight pieces of possible brazier (Fig. 23.5) with stabbed decoration came from fills 187 and 227. A variety of clay braziers is recorded from Caere, including one with a stabbed surface (Nardi, 1992b: fig. 660, 3a).

Of the remaining contexts, the southern post-pits yielded a total of 85 sherds (847 g). Of particular note are two pieces of sixth-century bucchero including a carinated bowl (Fig. 17.23) associated with an undated coarse-ware white-slipped jar (Fig. 17.24), miscellaneous coarse-wares and a black-glazed sherd from post-pit 377. The lid-seated jar might suggest some contamination of this context, perhaps associated with demolition/abandonment. A further three body-sherds of bucchero came from context 413, associated with coarse-wares and one sherd of black-glazed orange ware. A sherd of painted black glaze in a fine buff ware came from post-pit 401, associated with a fragment of soft brown tile.

A group of eight *microceramiche* was recovered from pit 231 (Fig. 18.78–82) and a further example of similar form from pit 272. The pale pinkish orange (Munsell 7.5YR 7/6), fine-textured vessels are handmade. The pedestalled bases show distinct wire-cut marks where the pots have been removed from a turntable or similar. Each vessel has a pair of horizontal loop handles. Several have blackened lips suggesting burning of incense or oil. Groups of votive miniature pots such as these have been noted elsewhere in foundation deposits, for example, in Pompeii beneath the tablinum of the House of the Vestals (Bon *et al.*, 1998: 155), or below the sanctuary at

Paestum, where they are associated with Roman repair work dating to the second century BC (Pedley, 1990: 138).

Pit 678 below house 11.5 yielded 141 sherds (3,549 g), along with several fragments of tile. By sherd count the pottery comprises 21% fine-ware, 44% coarse-ware, 2% dolium, 22% amphora and 11% miscellaneous jug/amphora. The material appears to include several sherds dating back to the sixth/fifth centuries alongside wares of later date. Amongst the earlier fine-wares are two bucchero vessels, a rim fragment with a vertical handle, probably a kantharos (cf. Rasmussen, 1979: pls 31–3) or a kythos (carinated cup) (cf. Rasmussen, 1979: pls 34–5), and a base (Fig. 20.100) from a bowl (cf. Rasmussen, 1979: pl. 41). A date from the sixth to early fifth centuries is likely for both vessels. Also present are some black-glazed bowls/cups of probable Campanian or south Italian origin dating to the fourth and third centuries. In addition to the fine, buff-coloured, glazed wares, there are a number of slightly coarser orange-brown fabrics. A bowl base-herd has the letter A inscribed on the underside (Fig. 20.98). Other fine-wares include a small sherd from a closed form decorated with a red-orange painted stripe. Also of note are at least two painted wares, one a large bowl with painted horizontal bands in orange-red (Fig. 20.103) and the other a small body-herd with red-brown paint on a white slip.

Amongst the several amphora sherds are at least two rims and several buff body-sherds belonging to Corinthian types (for example, Fig. 20.102) and a body-herd from a black-glazed table amphora with an Etruscan graffito (Fig. 20.101), probably dating from the sixth or fifth century BC. Unfeatured body-sherds include some of a red ware with distinctive fine white inclusions, possibly an Aegean fabric, and a sherd of the local Campanian black-sand fabric. At least three sherds of dolium were present and a number of coarse-wares including jars, bowls and lids with knobbed handles.

In addition to the pottery there were at least 30 fragments of tile. Many of these are in soft brown fabrics accompanied by a few harder, better-fired examples. Many of the tiles show evidence of intense post-firing burning with traces of vitrification. Recognizable types include both imbrices and tegulae.

A moderately small group of wares came from other horizons below house 11. The earliest contexts (*context group* 100) produced twenty sherds, mainly comprising coarse-wares and early buff wares along with two sherds of bucchero. A similar amount of material came from *context group* 102 but no fine-ware. Of particular note were the deposits of ceramic building material associated with the construction of walls 438 and 480 (Fig. 10). Much tile, including tegulae, was associated with the former, while amphora, dolium fragments and a sherd of a large, black-sand-tempered bowl were also associated with 480. The remainder of the assemblage from levels below house 11, some 134 sherds, came from *context group* 103

and includes intrusive material. The group featured several sherds of black-sand amphorae (Dressel 1 and 2–4) and a greater variety of coarse-ware than seen hitherto, including the thinner red-brown cooking wares. Amongst the fine-wares were several thin-walled brown, slightly granular wares more typical of Augustan assemblages and a number of black gloss vessels. A rim from a possible Attic ware plate came from pit 671 (668) in the northwest corner.

***Illustrated sherds: Group B (fifth/third–second centuries) (Fig. 17)***

***Context group 4, post-pit 377***

23. Carinated bucchero bowl (362). Cf. Rasmussen (1979), carinated bowl type 1, dated to first half of sixth century.
24. Coarse-ware lid-seated jar (362). Coarse, granular, dark orange fabric with a white slip.

***Context group 5, pit F335, lower fills***

25. Base with foot-ring from a bucchero bowl (315).
26. Curved-wall bucchero miniature bowl or *phiale* (271). Cf. Rasmussen (1979), pls 41–2, sixth–fifth centuries.
27. Small carinated bucchero dish (271), cf. no. 1, sixth century.
28. Small bucchero body-sherd with an incised graffito (271).
29. Gnathian ware skyphos (328). Black-glazed ware with a painted semi-geometric design in red and white paint comprising two outer horizontal lines of white paint, two inner parallel lines of red paint and white motifs in the middle. Cf. Green (1976), no. 12, pl. 14a–b, dated 340–320 BC.
30. Very small black-glazed cup, unglazed on the underside (328). The base is cracked by firing flaw. Pale yellow paste. Cf. Morel (1981), pl. 49, type 2421d 1.
31. Curved-wall dish with a slightly expanded lip (333). Pale orange fabric with a glossy black glaze. Cf. Morel (1981), type 2600.
32. Curved-wall black-glazed bowl (331). A pale orange paste with a very fine glossy brownish black glaze.
33. Small curved-wall dish (331). Red-brown exterior, black towards base.
34. Body-sherd from a closed form with a brown burnished exterior and impressed decoration (271).
35. Handled bowl in a brown-black coarse-ware (271).
36. Brown coarse-ware domed lid with a smoothed exterior (328).
37. Large red-brown coarse-ware bowl with a short flaring rim (315).
38. Brown-black coarse-ware jar (270).
39. Handmade black coarse-ware jar with a slightly expanded rim (315).
40. Dark brown to red-brown coarse-ware jar (315).

***Context group 5, pit F355, upper fills 301, 227 and 187***

41. Shallow dish, burnt (227). Possibly Attic ware. Pale grey paste with a slightly dulled metallic gloss.
42. Shallow curved-wall dish (187). The black-glazed interior is decorated with a white-painted design, perhaps a vine. The exterior has an unglazed band around the rim with a black-glazed lower body.



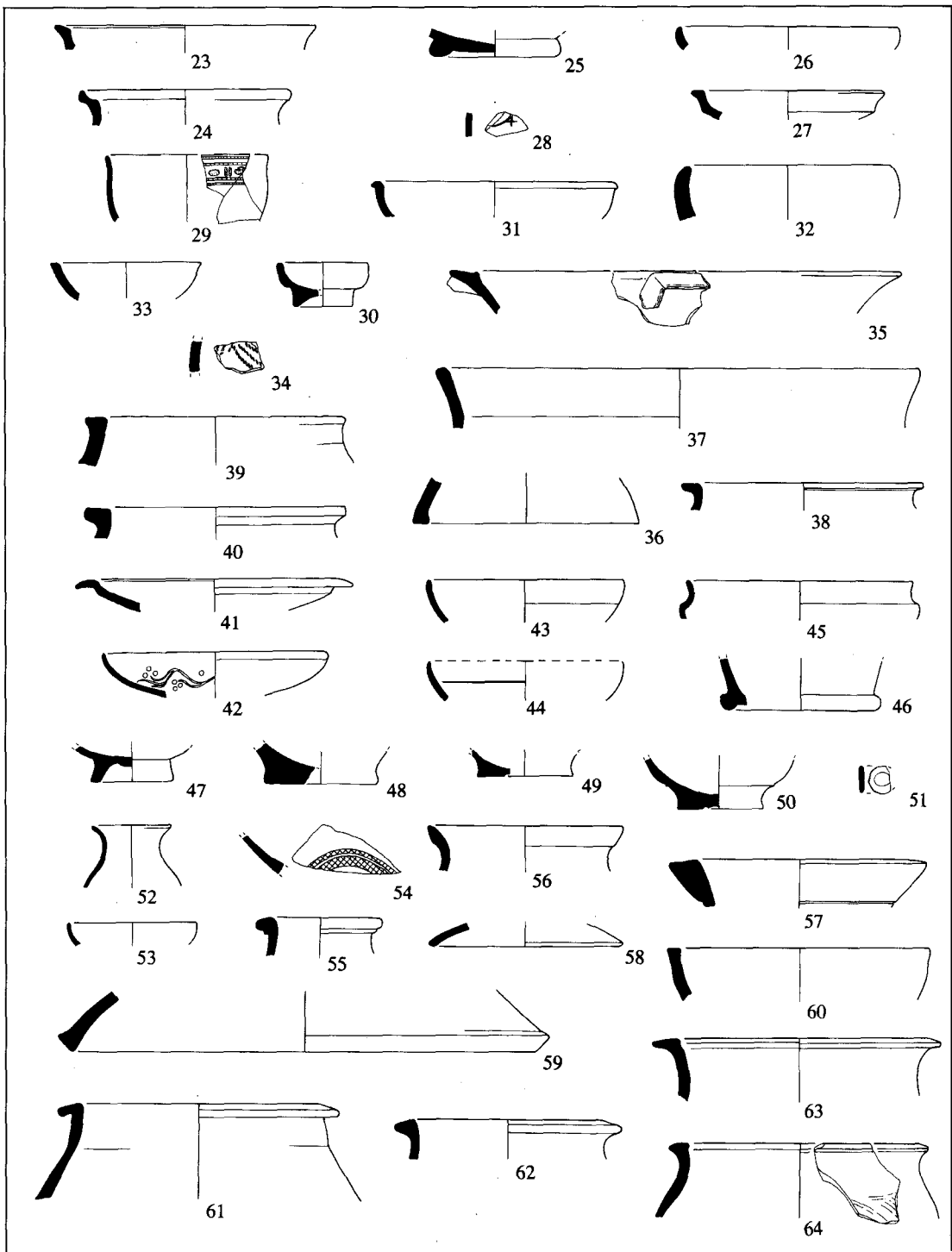


FIG. 17. Pottery Group B, nos. 23-64. Scale 1:4.

43. Curved-wall dish (301). The interior surface has a slightly streaky, metallic black glaze on a mid-orange paste. The upper exterior zone is unglazed while the lower zone has a black metallic glaze. A sherd from the same or an identical vessel is present in context 227.
44. Curved-wall black-glazed dish decorated with a single horizontal line of white paint on the interior surface (187).
45. Carinated, black-glazed cup. Brownish orange paste with a dense black, slightly lustrous glaze (227). Cf. Morel (1981), type 3200.
46. Skyphos base with a rounded, protruding foot unglazed on the underside (227). Pale orange paste with a slightly metallic brownish black glaze. Cf. Morel (1981), type 4300.
47. Black-glazed base from a cup/bowl (227). Glossy metallic glaze in a pale orange, very fine paste. Unglazed on the base.
48. Black-glazed base of a small cup/bowl (187). Unglazed inside the foot-ring.
49. Black-glazed base from a cup/bowl (187). Unglazed on the underside of the base; pale yellow fabric.
50. Base from a black-glazed bowl (187). The base has a ring of dark brownish to black glaze and is unglazed in the central area. The exterior has a high quality black glaze.
51. Small counter made from a black-glazed body-herd. Fashioned to leave a black-glazed circle on the upper face (227), Small Find [SF] 1398.
52. Small flask in a buff fine-ware (187).
53. Small dish in a buff fine-ware (227).
54. Buff body-herd decorated with concentric bands of dark brown paint (227).
55. Beaker in a fine buff fabric with a white slip (187).
56. Jar in a buff fabric with a pale brown core (187). The paste contains fine, rounded, dark brown inclusions and mica.
57. Amphora, Corinthian type A (227). Salmon-pink, very fine fabric.
58. Small coarse-ware lid (187).
59. Red-brown coarse-ware lid with a black interior (227).
60. Dark grey-brown coarse-ware bowl (or lid) (227). Traces of burning on the interior surface.
61. Brown-black coarse-ware jars (227, 187, 270).
62. Brown-black coarse-ware jars (227, 187, 270).
63. Patchy grey-orange-brown coarse-ware jar (227).
64. Brownish black coarse-ware jar with scrape marks on the body (227). Cf. D'Ambrosio (1994), fig. 12, inv. 40571 from tomb no. 2.

*Wares from other fourth- to third-century contexts (Fig. 18)*

65. Small bucchero dish (253). *Context group 6*. Cf. Albore-Livardie (1979), type 15A, sixth century; Rasmussen (1979) miniature bowl type 1, sixth-?fifth centuries.
66. Small ?handled cup (3.61). Smooth pale brown ware with a reddish inner core. Trace of handle scar below the rim. *Context group 6*.
67. Body-herd from a closed form (258). Orange paste with a black-glazed interior and a painted exterior. The painted design comprises a dark red, mid-brown and purplish brown pattern on a pale yellow background. *Context group 7*.
68. Curved-wall dish (218). Campanian A ware. *Context group 7*.
69. Curved-wall dish (233). Mid-orange-brown paste with a dullish thin black glaze. *Context group 7*.

70. Curved-wall dish (218). Pale yellow paste with a black glaze. *Context group 7*.
71. Black-glazed skyphos (258). Mid-yellow-orange fabric with a dullish black glaze. *Context group 7*.
72. Base of a ?skyphos with a slightly protruded foot (218). Pale buff fabric with a black glaze. *Context group 7*.
73. Amphora. Buff fabric (384). *Context group 6*. Cf. Boss (1993), Samian amphora from Caere, figs 521–2, 635–7. Sixth–fifth centuries.
74. Jar with a thickened lenticular lip (218). Buff ware with a pinkish brown core. Sandy texture with sparse fine inclusions. *Context group 7*.
75. Small round-bodied, brown-black coarse-ware jar (246). *Context group 7*.
76. Wheel-made black coarse-ware jar (246). *Context group 7*.
77. Large globular-bodied jar/amphora (218). Dark orange with pinkish orange surfaces. Relatively fine fabric with few visible inclusions. *Context group 7*.
78. Shallow dish with a heavy lenticular rim (218). Orange-brown ware with a grey core containing black mica and clear grains of quartz. *Context group 7*.
- 79–83. Five examples of the eight miniature vessels (218). *Context group 7*. Pale pinkish or orange-buff fabric. Very fine fabric with no visible inclusions and a matt, slightly chalky feel. Many of the examples show traces of burning and blackened residue on the interior or rim surfaces. The bases have concentric marks where the vessels have been wire-cut from a surface. SF 1060–2, 1057, 1059.
84. Crudely fashioned tile disc (218). Buff surfaces with a grey core. *Context group 7*.

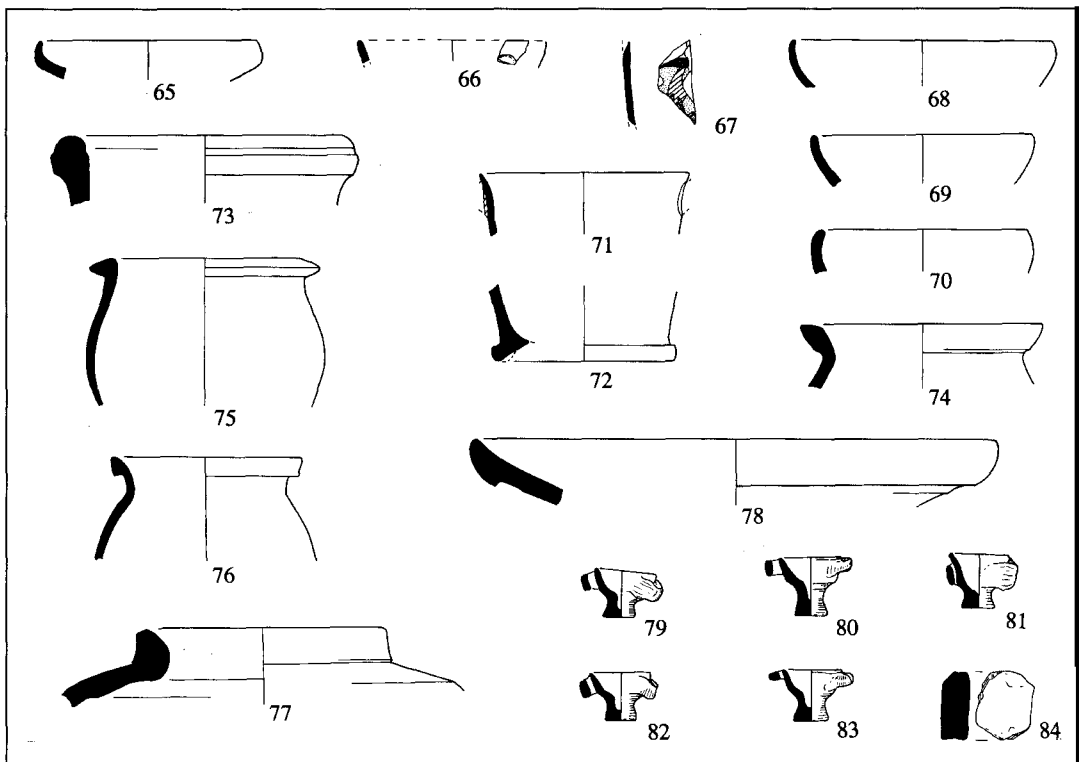


FIG. 18. Pottery Group B, nos. 65–84. Scale 1:4.

## Context groups 100, 102 and 103 (Fig. 19)

85. Coarse-ware dish with a blackened interior and red-brown exterior (600). *Context group 100.*
86. Coarse-ware cooking pot, dark brown in colour (600). *Context group 100.*
87. Flask in an orange-brown highly micaceous coarse-ware (600). *Context group 100.*
88. Handmade dolium (480). *Context group 102.*
89. Wide-mouthed spouted jar with a short vertical rim. Greenish white in colour (480). *Context group 102.*
90. Handled cup covered with a semi-lustrous metallic black glaze (630). *Context group 103.*
91. Small dish (595). Light grey fabric with a dense black, slightly glossy glaze. *Context group 103.*
92. Coarse-ware dish in a reddish brown ware (595). Traces of a handle attachment. *Context group 103.*
93. Lid (595). Dark orange in colour with traces of burning on the underside. *Context group 103.*

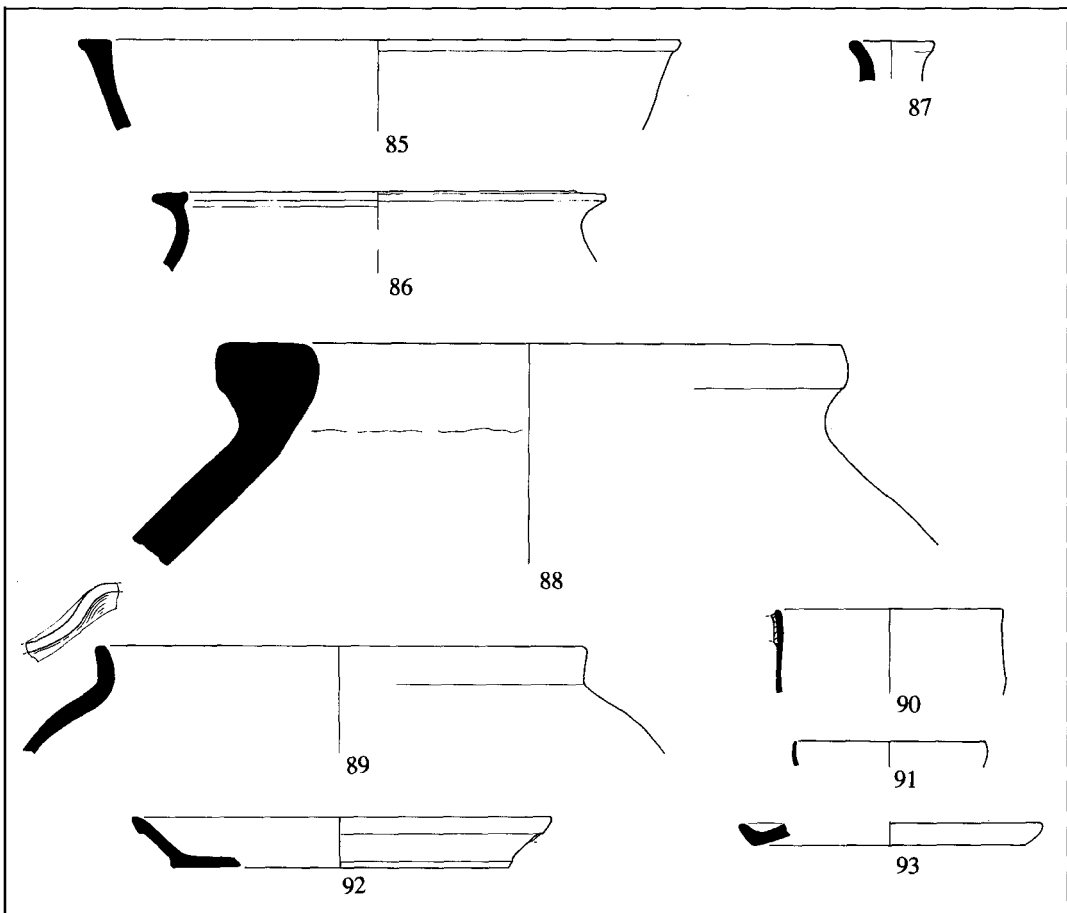


FIG. 19. Pottery Group B, nos. 85-93. Scale 1:4.

## Context group 101, pit 678 (679) (Fig. 20)

94. Base from a small bowl. Pale buff-yellow fabric. Very fine glossy black exterior, slightly duller interior with a worn inner base. The unglazed area within the foot-ring shows traces of red ?paint.
95. Small dish with a flat base, unglazed on the underside. Very fine black glaze over a pale buff fabric.
96. ?Skyphos (cup with horizontal handles). Fine, buff-coloured fabric with a brownish black glaze.
97. Small black-glazed body-sherd with stamped decoration.
98. Base of an open form with a foot-ring. The lower exterior zone and foot-ring are unglazed. The exterior body has a glossy black glaze, the interior surface a duller red-brown to black glaze. The letter 'A' has been incised into the underside of the base inside the foot-ring.
99. Bowl. Dark brownish orange fabric with a black glaze and an unslipped band below the rim. Cf. Santoro (1992a), Etruscan archaic black-glazed bowl, fig. 339, D50.2, 51.1-2.
100. Base with a foot-ring from a bucchero bowl.

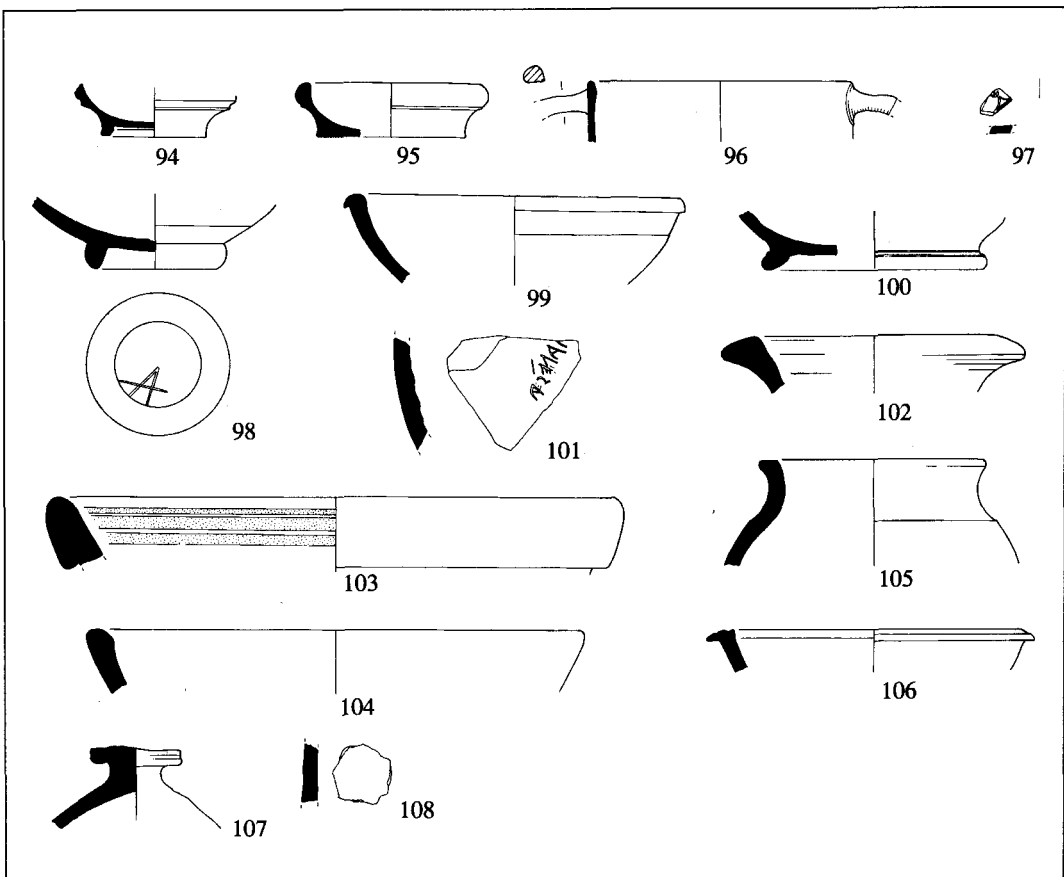


FIG. 20. Pottery Group B: nos. 94-108. Scale 1:4.



101. Body-herd from a black-glazed table amphora with a dullish black exterior glaze (cf. Rizzo, 1990). A name graffito (PAPESA) has been scratched onto the outer surface (see pp. 82–4 and Fig. 24, below).
102. Rim from a Corinthian A type amphora. Buff, fine textured fabric.
103. Large heavy-rim bowl decorated with horizontal bands of orange-red paint on the internal rim face. Cf. Nardi (1993a), coarse-ware basin type 11c, fig. 582–3.
104. Red-brown coarse-ware bowl.
105. Black coarse-ware necked jar, crudely wheel-made. Cf. Bonghi Jovino (1984), tav. 94.6.
106. Red-brown coarse-ware reeded-rim dish.
107. Brown-black coarse-ware lid knob.
108. Poorly fashioned counter made from an amphora/jug body-herd in a fine red fabric.

### GROUP C (*CONTEXT GROUPS* 10–14) — SECOND–FIRST CENTURIES BC

The latest sequence of features cutting the worked soil or cutting earlier features, the contexts sealing the uppermost fills of pit 335 and the levelling or make-up deposits for house 12, together yielded 1,280 sherds (18,478 g). This group of material shows the greatest diversity of wares, with a number of new fabrics appearing for the first time. These include several new amphora fabrics amongst which can be recognized Cretan, Aegean and local Dressel 1 types. Amongst the fine-wares sherds of *sigillata* (Eastern *sigillata* A), a small number of thin-walled wares and lamps make an appearance. Amongst the coarse-wares, Pompeian red ware, probably made locally at nearby Cuma (Chiosi, 1996), also appears for the first time. Taking the group as a whole, amphorae account for 17% by count, coarse-wares for 52%, fine-wares for 21%, other table-wares for 7.5% and dolia for less than 1%. Several possible prehistoric sherds were also noted. A significant level of redeposition is suggested by the number of sixth- to fifth-century sherds also present in the group, notably bucchero and painted Etrusco-Corinthian ware (M. Rendeli pers. comm.).

#### *Illustrated sherds: Group C (Fig. 21)*

109. Carinated bucchero bowl (186). *Context group* 13. Cf. Rasmussen (1979), pl. 41 type 248/9, sixth century.
110. Bucchero bowl (217). *Context group* 14. Cf. Pandolfini (1992), tav. 370, E41.
111. Rim fragment from a bucchero ?kantharos with upstanding handles (189). Cf. Rasmussen (1979), pls 30–3. *Context group* 11.
112. Bucchero kantharos (190). *Context group* 12.
113. Simple, oval-section handle from a bucchero vessel, either a jug or a cup (kythos or kantharos) (217). *Context group* 14.
114. Base with small foot-ring from a bucchero bowl (201). *Context group* 12.
115. Carinated Attic ware dish (190 and 201). Very glossy black glaze. *Context group* 12.

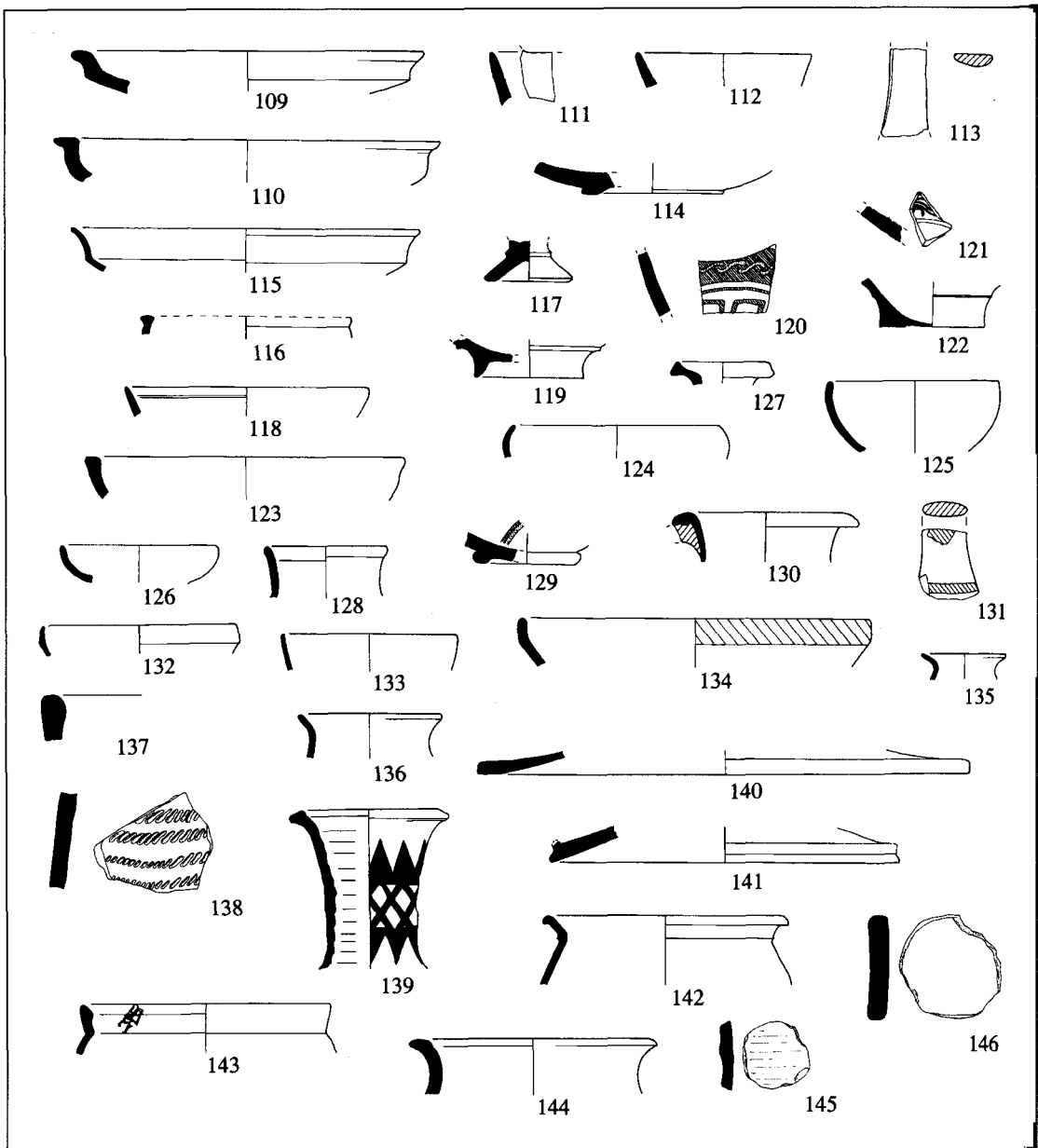


FIG. 21. Pottery Group C: nos. 109-46. Scale 1:4.

116. Fragmentary rim from an ?Attic bowl (196). *Context group 14*.  
 117. Pedestalled base from a ?chalice (195). The zone above the foot on the exterior is unglazed, as is the very edge of the foot and the underside. *Context group 14*.  
 118. Campanian A cup decorated with a single white line below the lip on the interior (190). *Context group 12*.

119. Base with high foot-ring with a very glossy black surface glaze on a pale orange paste (179). The underside is unglazed. *Context group 14.*
120. Body-sherd with painted geometric-style decoration (186). White painted S-shapes above reddish brown bands and squares. Buff, very fine fabric. *Context group 13.*
121. Body-sherd decorated with sgraffito design of trailing stems (189). Glossy black interior, unglazed exterior. *Context group 11.*
122. Base from a cup/bowl (195). Black glaze on a pale buff fabric. Unglazed on the underside. *Context group 14.*
123. Curved-wall dish (190). Black glaze on a pale to mid-orange fine paste. *Context group 12.*
124. Concave-walled bowl (190). Pale orange fabric with a reddish brown internal slip and a blackish brown, poorly adhered, external slip. *Context group 12.*
125. Hemispherical cup (186). Fine yellowish buff paste with a dullish glossy black surface glaze. *Context group 13.*
126. Small, shallow dish (190). Pale, buff fabric with a black surface glaze. *Context group 12.*
127. Flagon (190). Greenish white gritty fabric. *Context group 12.*
128. Jug or narrow-necked jar (201). Fine buff fabric with traces of a greyish red painted band on the interior of the rim. *Context group 12.*
129. Base with a foot-ring from an open form decorated with narrow concentric bands of red and orange-yellow paint on the interior (217). Fine buff fabric. *Context group 14.*
130. Handled jug in a fine buff fabric (217). *Context group 14.*
131. Buff-ware handle from a jug with greyish brown painted decoration (190). *Context group 12.*
132. Carinated dish in a buff fine-ware (186). *Context group 13.*
133. Cup in a thin-walled dark grey granular fabric (190). *Context group 12.*
134. Bowl in a fine, buff ware decorated with a band of orange-brown paint (217). *Context group 14.*
135. Fine buff ware jar/flask (190). *Context group 12.*
136. Flask/jar in a thin-walled coarse-ware (190). *Context group 12.*
137. Fragmentary amphora rim in a hard, pale orange fabric containing inclusions of fine limestone (190). *Context group 12.*
138. Body-sherd from a closed form with rouletted decoration. Orange, black-sand-tempered fabric (190). *Context group 12.*
139. Flagon in a white-slipped orange, granular coarse-ware. Black, painted geometric decoration (179). *Context group 14.*
140. Wide-mouthed jar with a bevelled internal face (196). Orange, granular coarse-ware. *Context group 14.*
141. Coarse-ware lid (190). *Context group 12.*
142. Lid in a red-brown to black coarse-ware (190). *Context group 12.*
143. Black coarse-ware everted rim jar (190). *Context group 12.*
144. Red-brown coarse-ware jar with a grey core and interior (185). *Context group 11.*
145. Crudely fashioned counter (236). Amphora/jug Campanian black-sand-tempered body-sherd. *Context group 13.*
146. Counter fashioned from a potsherd (190). Light brown sherd with a cream surface. *Context group 12.*

## SUMMARY

From a functional perspective the proportion of wares is surprisingly consistent across the three defined chronological groups. In each case coarse-wares, mainly cooking wares such as jars, bowls/dishes and lids, account for 50–5% by sherd count. The ratio of amphorae also remains moderately consistent, rising slightly in the later group from 12% to 17%. Fine-wares account for 30% of the earlier assemblage, falling to 18% in the fourth-second centuries, but rising again to 21% for the latest material, which is also perhaps the most diverse in both the range of forms and fabrics. Since this is the first quantitative study of its kind from Pompeii, no comparisons of the relative abundance of the various wares can yet be made with other assemblages within and without the city.

The repeated presence of significant chronological markers, such as the Etruscan bucchero vessels, throughout the sequence raises questions, not only about the formation of the deposits in which the sherds occur and the life expectancy of such vessels, but also about the nature and density of the archaic occupation. As might be expected, the highest percentage occurs in Group A at 12.5%, falling to just 2% in Group C. Bucchero has been noted at several sites in Pompeii (cf. Bonghi-Jovino, 1984; De Caro, 1985; 1986). It may be significant that there is a quite limited range of vessels from Pompeii compared with the known bucchero repertoire further north (cf. Albore-Livardie, 1979; Rasmussen, 1979; Pandolfini, 1992), with mainly carinated bowls, curved-wall bowls, cups and only a small percentage of closed forms. This could be explained by the fact that such vessels were being used in a domestic context and that the more elaborate examples, many from tombs, were specifically for funerary usage. Caere, however, a probable source of production, also shows a greater diversity of forms, including jugs, amphorae, oinochoe, craters, plates and lids, in addition to a variety of bowls and cups (Pandolfini, 1992). The less varied range at Pompeii might suggest bulk consignments from specific workshops, indicating that the Etruscans had established good commercial links with the bay of Naples from the mid-sixth century onwards, or perhaps local production.

Plain black-glazed vessels, of probable Italian rather than Attic origin, are quite marked in the early group, accounting for 8% of the total. Etruscan black-glazed vessels imitating Attic forms were found at Caere (Santoro, 1992a). With the further development of the local Campanian and south Italian black glaze industries in the fourth century, this figure not surprisingly rises to 10.5% in Group B which also includes, possibly intrusively, a number of vessels of local Campana A. A single sherd of Gnathian pottery produced in Apulia in the fourth and early part of the third centuries (Green, 1976) also appears in Group B.

Small though the assemblages are, they allow the opportunity to begin to see the development of cooking wares from the sixth century (Fig.16.20–1) to the fourth/third centuries (Fig. 17.35–40 and 58–64). A number of Campanian black-sand amphorae and coarse-wares attest to a distinctive, local production from around the third century BC. Loom weights similarly appear to be locally made from around this time (below, pp. 80–1).

## LAMPS (HE)

Seven fragments of lamp were recovered from contexts 82, 85, 179 and 185, *Context groups* 10–14 (Pottery Group C). All the pieces are from mould-made ceramic lamps probably dating from the first century BC. Only the partially preserved lamp from context 185 and two nozzle fragments from context 179 are diagnostic and merit more detailed comment. With the exception of one sherd from context 179 (no. 5), all the fabrics appear identical macroscopically. No provenance work has been attempted.

### *Catalogue*

1. Fragment, preserving the rear half of a Dressel 3 lamp (Fig. 22). The right-side lug, which is decorated with simple parallel marks, survives. The handle is broken off. Three raised circular mouldings on the shoulder surround the plain discus with its central filling hole. A number of bubbles in these rings attest to the manufacture of this lamp in a plaster mould. The base is damaged, but part of one impressed circle remains. Fine orange-buff fabric, slightly micaceous, with no other visible inclusions; orange-red slip. Length 50 mm; width 58 mm; height 26 mm. *Context group* 11 (185).



FIG. 22. Fragment of Dressel 3 lamp.



- Dressel 3 lamps are generally dated to the second half of the first century BC (Ricci, 1973: 193–7; Farka, 1977: 32–8). For examples with a plain discus compare, for example, Ricci, 1973: figs 14 and 15; Farka, 1977: 190, no. 117, pl. 11; Ruggiu, 1980: 51–2, nos. 77, 82; Bailey, 1980: Q727 bis, pl. 104.
2. Small fragment preserving part of the splayed blunt nozzle of a late Republican lamp. Second half first century BC. Fine orange-buff fabric, slightly micaceous with no other visible inclusions. Dark red-brown slip. *Context group 14* (179).
  3. Small fragment preserving part of the splayed blunt nozzle of a late Republican lamp. Second half first century BC. Fabric as no. 2. Dark red slip. *Context group 14* (179).
  4. Discus fragment, no decoration surviving. Fabric as no. 2. Worn orange-red slip. *Context group 14* (179).
  5. Wall fragment. Fine mid-brown, inclusion free fabric. ?Dark brown slip/unslipped. *Context group 14* (179).
  6. Wall/shoulder fragment. Fine orange-buff fabric, slightly micaceous; no other visible inclusions. Dark brown glossy slip. *Context group 14* (85).
  7. Wall/shoulder fragment. Fabric as no. 6. Dark brown glossy slip. *Context group 14* (82).

## FIRED CLAY (JT) (FIG. 23)

### *Loom weights*

At least five complete fired-clay loom weights were recovered from the pre-house levels. Two of these came from fourth- to second-century features cut into the worked soil, one from pit 335, the other from the ritual deposit in pit 231 (Fig. 23.1–2). The other three came from the latest pre-house levels dating to the second–first centuries BC. Three examples have an impressed motif on the upper surface, a ring on no. 2, a small circular depression on no. 3, and a circle bisected by two parallel lines on no. 5. Both the earlier examples are made from a hard, compact, orange black-sand-tempered fabric with whitish surfaces. Examples nos. 4 and 5 are in a slightly coarser orange fabric containing black sand and a scatter of fine argillaceous (?volcanic) red-brown and grey inclusions up to 2 mm across. Loom weight no. 3 was made from a very fine, pale orange fabric with few visible inclusions.

Loom weights of this type are very common at Pompeii, and several examples identical to the pre-house examples both in fabric and shape have been recovered from the later levels of first-century BC and first-century AD date associated with houses 11 and 12.

At Paestum a number of fired-clay loom weights was recovered from votive deposits where it is noted that such cheap and easily available items were probably used as offerings by women to a female divinity. They have also been found in numerous sanctuaries in southern Italy and Sicily (Pedley, 1990: 151). Similar-shaped loom weights were also found at Caere (Moscati, 1992: type 1), many with some form of decoration or signature on the upper face.

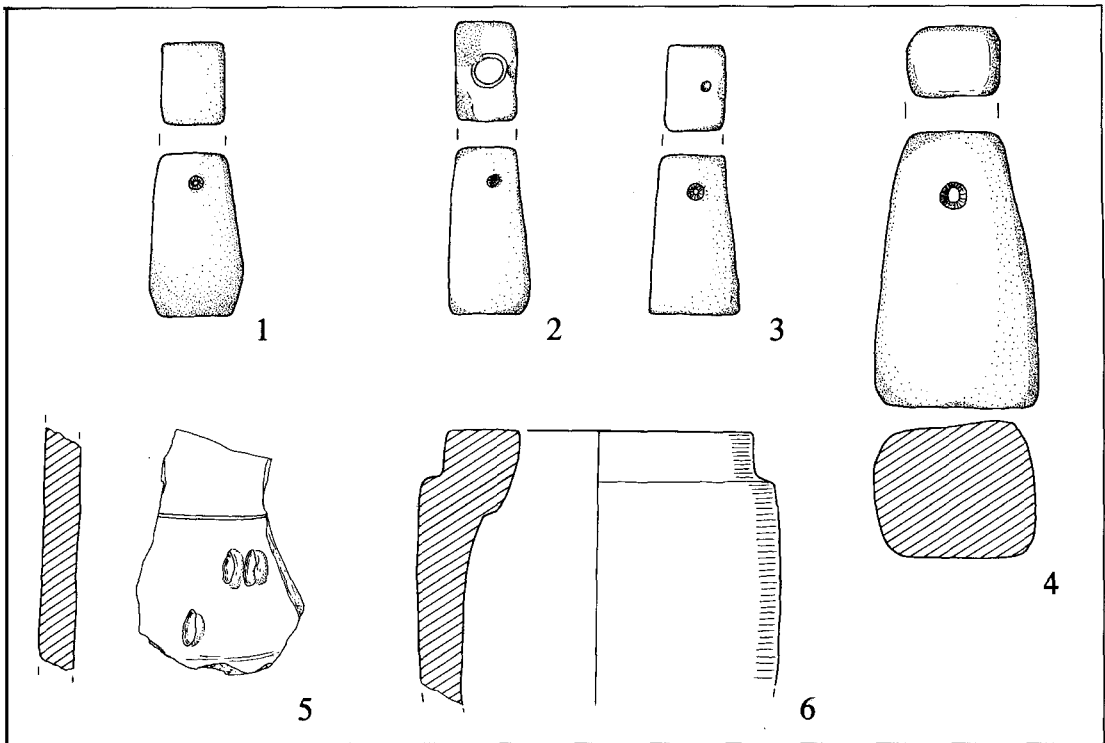


FIG. 23. Loom weights and other miscellaneous objects of fired clay. Scale 1:3.

*Catalogue (Fig. 23)*

1. Complete loom weight with a single perforation. The base is worn and there is some side damage. Length 64 mm; maximum width 38 mm. *Context group 5* (pit 335 (227), SF 1396).
2. Complete loom weight with a single perforation. Length 66 mm; maximum width 33 mm. Decorated with an impressed ring. Diameter on the upper face 14 mm. *Context group 7* (pit 231 (218), SF 1397).
3. Complete loom weight with a single perforation. Length 62 mm; maximum width 35 mm. Marked with a small off-centre depression, 4 mm across, on the upper face. *Context group 11* (pit 225 (224), SF 1066).
4. Large complete loom weight, slightly worn. Length 109 mm; maximum width 65 mm. *Context group 14* (pit 309 (310), SF 1307).
5. (Not illustrated). Complete but very worn loom weight with a single perforation. Length 75 mm; maximum width 40 mm. The top is marked with an impressed circle bisected by two crossbars. *Context group 14* (195, SF 1074).

*Other ceramic material*

- Fig. 23.5. Several fragments of possible brazier were recovered from the upper fills of pit 335. The fragments have irregular stab-marks made when the clay was quite wet. Reddish brown in colour with abundant mica. *Context group 5* (227).
- Fig. 23.6. Ceramic building material. Part of a tube in a coarse reddish brown fabric with whitish surfaces. *Context group 5* (187).

### A NEW ETRUSCAN GRAFFITO (MR)

An inscription in Etruscan lettering was noted on a body-sherd of a vessel of closed form, probably a container for table rather than for transport (Figs 20.101 and 24). The vessel was painted on its exterior with dullish black glaze. The glaze has numerous scratches and flakes. The inscription had been scratched in the surface after firing. The height of the lettering varies from 8 to 11 mm. The *ductus* is to the left.

### PAPESA

From a palaeographic point of view one may note:

- (a) the different graphic rendering of the two *alphas* incised respectively with three and four strokes. This double form is also met on a bucchero pat-  
tera from Stabia (*CIE* 8780) and on a small bucchero amphora from Pontecagnano (*CIE* 8844). The form with four strokes with oblique bar, which is later than the other, is also attested in inscriptions from Vico Equense (*CIE* 8806) and from Pontecagnano (*CIE* 8828, 8849, 8854). In the present case, a transitional period between one letterform and another is involved, datable within a broad span of the fifth century BC.

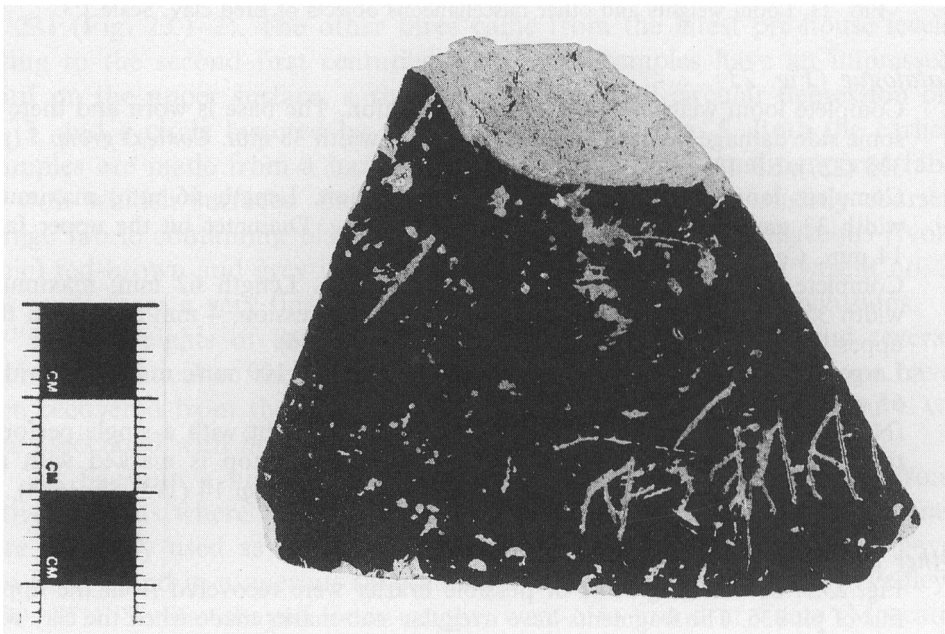


FIG. 24. Etruscan graffito (no. 101).

- (b) the three-stroke *pi* with oblique upper bar. A similar rendering is met in numerous inscriptions originating from Pompeii and surrounding areas with lengthened vertical strokes in the later examples: cf. *CIE* 8769 and 8774 from Pompeii, respectively dated to the mid-sixth and mid-fourth centuries BC; from Stabia (*CIE* 8780), dated to the late sixth century; from Vico Equense (*CIE* 8806), dated to the fifth century BC; and from Pontecagnano (*CIE* 8828, 8841, 8844), dated between the mid-sixth and mid-fourth centuries BC.
- (c) the *epsilon* with long upstroke rising above the cross-strokes. This appears characteristic of many incised inscriptions from Pompeii, both with the tail upwards (*CIE* 8748) and downwards (*CIE* 8778, 8781, 8782 from Stabia; 8806 from Vico Equense; 8834, 8837, 8844, 8848, 8857 from Pontecagnano).
- (d) the rendering of the three-barred *sigma* with the first two continuous to form a curvilinear stroke.

A further graphic feature to note is the slight gap that separates the final two letters from the previous three. From the above one may deduce, on palaeographic grounds, a date within the fifth century BC.

The sequence of letters on the Pompeian inscription is also found in another graffito on the handle of a Chian amphora from Vico Equense, dated to the fifth century BC (*pape savfi*, *CIE* 8806, with previous bibliography), with which it shares many graphic characteristics. That inscription may suggest the reading of the first letter, of which only a single vertical, slightly curving stroke remains. It would be hard for it to be an *alpha*, both in the absence of a junction with the crossbar, and because of the difficulty of the reading; it is equally unlikely to be a *tau*, both because the vertical stroke is curving, and because there is no sign of the cross-stroke. On the other hand, a possible reading would be a *pi* written rather unusually, not unlike the Vico Equense inscription, with three strokes.

Among the various possible solutions, then, the proposal of the reading *papesa* for our inscription seems not unlikely, given the notable palaeographic affinities, the geographic contiguity of provenance, the similar dating, and the occurrence of both on vessels of a similar type.

We are dealing with an onomastic formula: in the case of the Vico inscription it consists of two elements, though in the case of the Pompeian inscription this is to be confirmed; with the possible reading of a *pi*, the inscription could be considered complete. The inscription may be read in a number of ways.

- (a) The reading *papesa* could belong to a name consisting of a single element with the genitive of possession; against this hypothesis is the use in the suffix *-sa*, of the *sigma* in place of the *sade*, as attested in Campania, for

example at Capua (*cupe veliesà*: Rix, 1991: Cm 2.44; *CIE* 8687, datable between 500 and 400 BC). For both see also Marchesini (1994: 128, n. 27 and 126, n. 7).

- (b) An alternative reading would be *papes a*, consisting of a single-element name in the genitive, *pape-s*, followed by the letter *a*. In this case the interpretation of the *alpha* gives rise to considerable difficulties (possibly a numeral?).
- (c) A third possible reading would be *pape sa*, one supported by the gap before the final two letters. At the level of pure conjecture, we could see an attestation in Pompeii in the fifth century of an individual whose onomastic formula in the nominative form would consist of a *praenomen*, *pape*, of clearly Oscan origin (*Papius*: the Vico inscription is thus explained by Vetter (1933: n. 133)) and of *sa*. In the latter we might distinguish an abbreviated form of a gentile name, which we could supply on the model of the Vico parallel as *Savfi*, a name of local ethnic origin. The reading finds parallels in numerous inscriptions in Oscan or other central Italian dialects.

The picture that seems to emerge tends to the identification of the same individual in both texts: an Italic, possibly a trader of Oscan origin who spoke and, above all, wrote in Etruscan, one who conducted his trade in the area of the bay of Naples. In him we might recognize an example of the process, made much of by Cristofani (1987; 1996), of integration between Etruscan and native elements in a period certainly subsequent to the battle of Cumae, but preceding the definitive conquest of the Campanian cities by the local Italic populations.

### OTHER FINDS (NOT ILLUSTRATED)

Finds in materials other than ceramic are rare and the majority occurs in the latest *context groups*, 12–14.

### OBJECTS OF IRON (DR)

1. Handle: length 65 mm. A flat, tapering strip, curled into a single loop at the narrow end. The X-ray photograph shows that the broad end is curved slightly upwards, and it seems probable that the handle was broken here. This is a not unusual form of handle, found on single keys, for example latch-lifters and lift-keys, but it could also be used on other implements. *Context group* 13 (236).
2. Lock-box: *c.* 0.2 × 0.15 m. Five very corroded and partly encrusted fragments: two are flat, while one forms a corner, another an edge, and the fifth holds the remains of a rivet. None of the original breaks can be identified, so that none of the fragments can be joined with certainty. The method of making the corner has not been noted previously; it was formed by making a cut at 45 degrees in the corner of the sheet, then bending the pieces on each side of the cut upwards, pinching them together and fire-welding them. *Context group* 12 (206).



Iron nails varying in length between 40 and 80 mm were recovered from *context groups* 9, 12 and 13.

## OBJECTS OF BRONZE

### *Coins*

Three bronze coins were recovered from *context groups* 7 (209) and 12 (190, 199); only one has been identified. It has been attributed to Ebusus: F and dated to the second century BC. It was associated with the ritual pit 232 (*context group* 7 (209)).

The excavation produced a number of similar issues of Ebusus from residual contexts and these, with the full catalogue of the coins from the excavations, will be presented in the second report.

### *Other*

1. Dome-shaped bronze fitting pierced with holes below the rim. *Context group* 5 (271).
2. Fragment of a bronze ring: external diameter 50 mm; diameter of ring 5 mm. *Context group* 13 (184).

Other small, unidentified masses of bronze were recovered from *context groups* 5, 12 and 13.

## OBJECTS OF GLASS

1. Spherical, green-glass bead. External diameter 4 mm; diameter of hole 2 mm. *Context group* 13 (186).
2. Spherical, green-glass bead. External diameter 8 mm; diameter of hole 1 mm. *Context group* 5 (187).

## THE ANIMAL BONES

### INTRODUCTION (GC)

That animals were to be found within the town of Pompeii is amply demonstrated by the presence in AD 79 levels of numerous horse and donkey skeletons (as, for example, in the Casa dei Casti Amanti and here, in Insula IX, House 12.4 (Fulford and Wallace-Hadrill, 1998b: 86–9)), presumably of animals kept for work. However, this is just one of the roles and one aspect of the exploitation of animals by an urban society. From the albeit much more fragmentary material excavated, other aspects of the economy and also of other roles played by animals may be understood. The sample reported here derives from careful hand collection and from sieved soil samples (see below, pp. 95–6). As a result, a wide range of evidence was found — of mammals, rodents, birds, reptiles, amphibians and fish.

## MAMMAL BONES (GC)

### *The data*

The early contexts provided a sample of 454 fragments of mammal bone (Tables 2 and 3). Of these, just nine were from *context group* 101 (fourth–third centuries BC), from below house 11. Given the small size of the sample, the material from beneath house 12.2 has been grouped into two periods — *context groups* 1–9 (that is primarily fourth–third centuries BC but with some sixth-century material) and *context groups* 10–14 (that is second–first centuries BC). In addition there is a small amount of material from beneath house 12 that is from the early periods but which cannot be assigned to a precise *context group*. A comparatively high amount of material was identifiable to species (from 43% to 69%) and to bone (from 69% to 85%), the fragments being relatively well preserved, if fragmented.<sup>2</sup>

The sample is composed primarily of the bones of domestic animals. In fact there is just one fragment of a wild animal — this is an antler tine fragment of a roe deer. As will be discussed in more detail below, this need not be, and probably is not, indicative of the exploitation of roe deer as a food resource and/or the presence of roe deer in the immediate vicinity of the site. The following domestic species are present: pig, sheep/goat, cattle, an equid and dog.<sup>3</sup>

### *Pig*

Pig bones are dominant in both periods, below both houses. Of particular note is the partial skeleton of a neonate pig found in *context group* 7 (218) (see also below, p. 91), which accounts for at least 48% of the sample from *context groups* 1–9. In general the material is all from relatively young animals (Table 4). Neonatal individuals were found in the samples from beneath house 11 (*context group* 101) and from beneath house 12 (*context groups* 1–9: contexts 218 and 271; *context groups* 10–14: contexts 195 and 197). It would appear that most of the animals had died before having reached 23–31 months. The only clear exception to this is an individual in *context groups* 1–9 which exceeded 31–5 months at death. In terms of the mortality data, no differences emerge between the two main periods.

Although dental fragments predominate in the larger samples, a range of elements is present both here and in the smaller samples, from all parts of the skeleton. A predominance of cranial and dental elements is a common occurrence in faunal samples, given the relatively high number of individual elements and the structure of some of the parts. The neonate skeleton is only partial — the back bone is relatively well represented, there are bones of the upper/mid parts of the forelimb and hindlimb and of the limb extremities, and for the head there are four lower teeth and one fragment of cranium.

<sup>2</sup> However, it should be noted in assessing these figures that a number of vertebrae and a few ribs assigned generally to *context groups* 1–9 were clearly of pig and thus are included in the 'identifiable to species' count.

<sup>3</sup> The minimum number of individuals present has not been calculated because of the small size of the sample from any context.

On the basis of the canine fragments, both male and female pigs are present, there being three females and one male. Cut marks and butchery evidence were found on certain pig bones, as described in Table 5. It is significant that the two pig bones with cut marks from *context groups* 1–9 are of the neonatal piglet. The evidence illustrates four areas of butchery: cranium/axis, radius/ulna, pelvis, calcaneum/proximal phalanx. In addition it should be noted that a good proportion of the ‘small’ ribs and vertebrae found are probably from pig. It is clear that at least some skeletons had been split along the spine, although cut marks in other directions and areas were also observed on the vertebrae, and a number of rib fragments have one cut edge.

The pigs found in these early contexts were broadly comparable in size (Table 6) to the animals at Gravina, Montereale Valcellina, Populonia, Vaste (Fondo San Antonio) and various sites in the Biferno Valley (Campochiaro, Pietrabbondante, Colle Sparanise (C36) and A26), larger than those at Cerveteri and Narce, but possibly smaller than those at Pomarico Vecchio.<sup>4</sup>

### *Sheep/goat*

Sheep/goat bones are most common after those of pig, but they follow, in general, at quite some distance. From the limited amount of mortality data available, it would appear that whilst animals could die within their first year, most survived into their second or third years, and, in the case of animals represented in *context groups* 10–14, into their fourth year. As with pigs, no differences can be distinguished between the evidence for the two main periods.

A predominance of cranial and dental elements is also apparent in the sheep/goat sample, although to a lesser extent than for pigs (Table 2). A range of elements was identified, from both the fore- and hindlimb, including the limb extremities. The bones of sheep are more common than those of goats: in the sample from *context groups* 1–9, there are two bones definitely of sheep (a radius and a proximal phalanx) and one of goat (distal phalanx); and from *context groups* 10–14, one of sheep (proximal phalanx). No evidence is available from the two fragments from *context group* 101. Three sheep/goat bones have cut edges, two from *context groups* 1–9 and one from *context groups* 10–14 (Table 5). These are likely to be associated with butchery — all three are from the upper/mid part of the forelimb (humerus, radius (both *context groups* 1–9) and scapula (*context groups* 10–14)). In addition, an astragalus had been cut and/or ground down on both the medial and lateral sides. Measurements taken of the bones are given in Table 6. The animals represented here were of broadly comparable size to those at Cerveteri, Gravina, Montereale Valcellina, Narce, Populonia and Vaste, and in the Biferno Valley (Monte Vairano and Campochiaro), although perhaps tending to be in the lower part of the ranges noted at some of these sites (in particular Cerveteri and Montereale Valcellina). However, they were smaller than those at Pomarico Vecchio.

### *Cattle*

Small numbers of cattle bones were found in *context groups* 1–9 and 10–14. For both periods, approximately half of the fragments are from the head (including teeth), although there are also fragments of metacarpal, metapodial (*context groups* 1–9), ulna and distal phalanx (*context groups* 10–14) (Table 2). Mortality data are avail-

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<sup>4</sup> For the bibliographical references for the sites mentioned throughout the text, see Table 8.

able only for *context groups* 1–9 and indicate the presence of at least two animals, one of which had died before having reached 24–36 months, the other dying some considerable time after having reached 28–36 months (on the basis of the very advanced wear on a fourth premolar) (Table 4). One of the cattle bones, a metacarpal, had a cut edge (Table 5). This metacarpal belonged to an animal which was larger than those noted at Pietrabbondante (in the Biferno valley) and Gravina, and considerably larger than those found at Cerveteri.

### *Equid*

A few equid bones were recovered from *context groups* 1–9 and 10–14. These were primarily dental and mandibular elements, the only exception being a fragment of a scapula (Table 2). For *context groups* 1–9 the seven fragments of mandible found may in fact represent just one mandible. These remains will be discussed in more detail in the final report on houses 11 and 12 in the first century BC and first century AD, where the precise identification of the equid remains will be assessed.

### *Canid*

Three dog bones were recovered from *context groups* 1–9 and one from *context groups* 10–14. The fragments all derive from the head.

### *Bone modification: burning and weathering*

Burnt material was found in a number of contexts in both major periods. For *context groups* 1–9, bones in pit 231 (four fragments — two of which are of the neonatal piglet) and pit 272 (four fragments — three of which are of pig) are burnt (both *context group* 7), and one from pit 206 in *context group* 5 (a sheep/goat bone). The burnt material from *context groups* 10–14 is primarily from *context group* 12 (context 197 — five fragments, at least four of which are of pig; 199 — six fragments, all of pig), although two fragments from *context group* 13 had also been burnt (contexts 186 (a pig bone) and 236 (a rib fragment of a large animal)). However, it should be noted that in these contexts non-burnt material was also found (Table 7), and in general the burnt material formed a relatively small proportion of the sample. The exception to this is feature 206, which contains contexts 197 and 199, where a reasonable proportion of the samples (27.8% and 50% respectively) had been burnt.

Weathering is rare — only one fragment, a cattle metapodial fragment, from context 187 (*context group* 5) has such surface alteration.

No pathological conditions were observed, nor is there any evidence for gnawing.

### *Discussion*

From the outset, it must be realized that the material discussed here cannot be used to reconstruct the economic strategy prevailing at Pompeii in the fourth to first centuries BC. However, it is possible to comment upon aspects of it and upon the circumstances of deposition.

A relatively small number of mammalian species was found in these samples, due in great part to their small size. Bones of equids (horse and donkey), dogs and roe deer have been found, usually in small amounts, in many

fourth- to first-century BC deposits (for example, Populonia (roe deer), Monte Vairano (horse), Cerveteri (equid, dog), Roselle (horse, dog), Pomarico Vecchio (dog, red deer), Pompeii Forum (fourth–third centuries — horse, dog, donkey) and Roccagloriosa (horse, donkey, dog)).

It is, of course, no surprise that the samples are dominated by the bones of pig, sheep/goat and cattle. The relationship between the two main periods at first seems remarkably similar — pig 70%/76%, sheep/goat 22%/20%, cattle 8%/4% (Table 8). However, the presence of a partial skeleton in the earlier period is obviously having an effect on this — if it is excluded the relationship becomes 56% pig, 32% sheep/goat and 12% cattle. It will be interesting to see in future study if there is an increase in the importance of pigs at the expense of both sheep/goats and cattle in the more recent period elsewhere. Quantitatively valid and well-published samples of the fourth to first centuries are rare, and the comparisons listed in Table 8 span a broad area of central and southern Italy (plus one site in northern Italy), from various types of sites (including a number of sanctuary/cult sites). In general the sample sizes are very small. For the fourth–third centuries it would seem that more bones of pigs were found under houses 11 and 12 than might have been expected (compared, for example, with Monte Vairano, Pompeii Forum (fourth–third centuries), Roccagloriosa, Narce (phase IX) and Populonia). A similar pattern can be observed, but to a lesser degree, for the second–first centuries (compared, for example, to Carminiello ai Mannesi (Naples), Montereale Valcellina and San Giovenale). However, the relationship of the three species at Vaste, Fondo Sant'Antonio and in samples of this date from the Forum area in Pompeii are broadly similar to those from beneath house 12.

It was noted above that many of the pigs and sheep/goats present had died at a young age. For pigs this is a common occurrence, in particular in situations where the breeding of pigs may have been at some distance away so that the bones of the breeding stock are absent from the sample. At Pietrabbondante, Campochiaro, Roselle, Matrice (Samnite phase), Montereale Valcellina, Pomarico Vecchio and Vaste, Fondo Sant'Antonio the pigs had also died primarily within the first two years, although the animals at Populonia and Cerveteri seem to have been a little older at death (up to three years of age). All of these samples can, however, be contrasted with the situation at Roccagloriosa, where it would seem that the material is primarily representative of the breeding herd, presumably the young animals having been exported (Bökönyi, 1990: 330). For sheep/goats this implies that the animals present here had been raised (and culled) for meat, rather than for dairy products and/or wool. A similar picture was also obtained from Matrice and Populonia, whilst at Pomarico Vecchio the remains were mainly of adults. The fact that the animals seem to have reached a greater age in the samples of the second–first centuries BC need



not indicate a change in exploitation strategy, but could mean that, in qualitative terms, a wider range of meat was being obtained by the household(s) concerned.

As was noted above, roe deer was represented by just one fragment, an antler tine. As it is the tine, it is impossible to tell if this derives from a shed antler or is the result of the death of an animal, whether natural, accidental or intentional. Antler, of red deer, fallow deer and roe deer, has been an invaluable raw material from prehistoric times for functional artefacts and decorative objects, and this use has continued through to the Middle Ages and beyond (MacGregor, 1985). Bone and/or antler objects were quite common in Pompeii in later periods, such material being used, for example, for votive objects, decorative strips on furniture, hair-pins, combs, medical and toilet instruments, handles, gaming pieces and tools (such as those used in spinning and weaving) (Ward-Perkins and Claridge, 1976: cat. 70, 71, 235–6, 239; Gallo, 1994: 133–52).

The astragalus with cut/ground edges may be a partially worked item. Such bones have been used commonly from early times as gaming pieces, whether by themselves or as part of something such as a board game. Examples of such astragali were found at Gravina, in phase VIII deposits (second–first centuries BC) (Watson, 1992: 97), and at Pomarico Vecchio. However, such pieces were also used in the ancient world in divination — for example, large numbers were reported from sacred sites near the Kabeirion near Thebes (Boessneck, 1973).

### *Ritual sacrifices*

In a previous section (and also below, pp. 116–18) it was suggested that certain contexts may have been related to ritual (pit 206 — contexts 197 and 199; pit 231 — contexts 210 and 218; pit 232 — context 209). The material from each context therefore has been examined separately.

#### *Pit 206 (197)*

This included an unidentifiable fragment, three rib and six vertebra fragments of a small animal, seven pig bones (of young animals less than 19–23 months and of a neonate), and one sheep/goat bone. Of these, three (all vertebrae) have cut marks and five had been burnt.

#### *Pit 206 (199)*

Twelve pig bones were found in this context, six of which had been burnt. The material is primarily of animals which had exceeded 11–19 months, but one bone indicates an age at death of less than 19–23 months.

#### *Pit 231 (210)*

No mammalian bones were found in this context.

*Pit 231 (218)*

This context included 34 fragments attributable to a neonatal piglet, plus one fragment belonging to a juvenile pig. Four of the fragments had been burnt.

*Pit 232 (209)*

The two fragments of mammal bone found in this context are pig tooth fragments.

The data are lacking or are too few to be able to comment further upon contexts 209 and 210 (but see further below, pp. 116–18). The material from context 197 is not dissimilar to other, non-ritual, contexts from the site, containing a range of pig bones and also a sheep/goat bone, and thus the sample cannot be attributed clearly to ritual. However, it is probable that the material from contexts 199 and, in particular, 218 is attributable to ritual activity and that pig was the favoured animal. In the case of context 218 the animals involved were a neonate and a juvenile, whereas that/those in context 199 was/were older.

A number of sites have produced bone samples relating to ritual and/or related activities (for it should be recalled that feasting was often an integral part of ritual practices). For example, at Pyrgi there were a number of pits, including some of the fourth–third centuries BC, associated with a large sanctuary. At the base of a pit in area C a piglet and a badger were found, whilst in a pit behind temple A there were the skeletons of a dog, wolf and sheep at the base (Colonna, 1987: 79). In both cases other ‘gifts’ were associated with the skeletons. In two pits of the second–first centuries BC at Montereale Valcellina (Pordenone, northern Italy) were found the remains of sheep, pigs and domestic fowl (together with pottery sherds and carbonized vegetal remains), at least in part put into the pit whilst partially articulated (Petrucci and Vitri, 1995). This has been interpreted by Petrucci and Vitri as due to ritual practices, similar to those known from celtic necropolises of the second–first centuries BC in the Veneto.

At Satricum (Borgo Le Ferriere), at a slightly earlier date (ninth–fifth centuries BC primarily, although with some frequentation and use until the third century BC), a central sacred space was surrounded first by fire huts and later by monumental buildings, a layout typical of Latin settlements (Maaskant-Kleibrink, 1995: 123). This includes small pits which seem to have contained individual donations, including gifts of meat, as well as hut-pits containing the refuse of ritual meals (Maaskant-Kleibrink, 1995: 130). Some of the latter contain primarily bones of cattle and pigs, rather than the sheep/goat that would be representative of the semi-nomadic pastoral/farming society which is believed to have prevailed in the region (Maaskant-Kleibrink, 1995: 131). However, in other contexts sheep/goat and cattle bones dominate (Bouma *et al.*, 1995: 187). In fact Bouma has suggested that at

Satricum a ‘*suovetaurilia*’ (my inverted commas) was eaten during each religious meal, after which the skulls and/or leg of the animals were dedicated to the goddess in a bowl or a cooking jar (Bouma, 1996: 254).<sup>5</sup>

In Rome itself, the discovery of a votive pit containing the bones of sacrificed animals at the foot of the *Niger Lapis* in the Roman forum should be noted. The animals are cattle, sheep and pig — a *suovetaurilia* (Blanc and Blanc, 1958–9). The use of pig heads as ritual deposits occurred in the temple of Magna Mater on the Palatine (dedicated 191 BC) (personal observation, c. 1982). Pigs were also found to have an important ritual role at the sanctuary of Schiavi d’Abruzzo, for the fourth–first centuries BC (De Grossi Mazzorin, 1997), although in this case also it seems that it was primarily the head that was used. In the Hellenistic levels in a cistern at Vaste, Fondo Sant’Antonio, the remains of at least four foetal pigs were found, together with many other pig bones — a deposit which Albarella (1995: 303) concluded should be interpreted as being the result of ritual/ceremonial activity.

At Pompeii itself, in a pit in the tablinum of the House of the Vestals, eleven piglet bones (of at least three individuals) were found, associated with six small ceramic cups (Richardson, Thompson and Genovese, 1997). This deposit, provisionally dated to the fourth–second centuries BC (Bon *et al.*, 1995: 10; 1998: 155), has been interpreted as ritual activity associated with the construction of the atrium house that seals the deposit. It is also interesting to note that the animal most commonly pictured in later art-work in Pompeii as the sacrificial victim is the pig (Jashemski, 1979: 120, 254). Thus in the case of pits 206 and 231, beneath house 12, it would appear that certain contexts did have a ritual significance and that we are seeing a long-standing ritual tradition of sacrificing piglets to the gods.

## RODENT AND NON-MAMMALIAN BONE (AP)

This report describes the rodent and non-mammalian bone retrieved from sieved soil samples of pre-house date (sixth–first centuries BC) as well as bird and other bone from contemporary hand-retrieved material (Tables 9–11). A wide range of species is present: however, the remains of fish and small rodents dominate the assemblage. In view of the small size of the identifiable fraction no attempt is made to discuss temporal change.

### *Rodents*

House mouse (*Mus musculus*) and wood or yellow-necked mouse (*Apodemus* sp.) both occur in the small rodent assemblage (Tables 9 and 10). The presence of either *Apodemus* species would indicate some vegetation cover: however, yellow-necked

<sup>5</sup> The *suovetaurilia* was the most solemn of all Roman offerings and involved the sacrifice of a pig, sheep and bull (Toynbee, 1973: 134, 152, 164).

mouse (*Apodemus flavicollis*) prefers a more wooded environment than wood mouse (*Apodemus sylvaticus*) and is less likely to be found in urban habitats (Montgomery, 1991). House mouse was also found in late second- to early first-century deposits in the Forum at Pompeii (King, forthcoming).

### **Birds**

The only bird identified to species in this assemblage is domestic fowl (*Gallus gallus*). In the absence of pheasant (*Phasianus colchicus*) and guinea fowl (*Numida meleagris*) bones, it is assumed that the unspiciated galliform material is also domestic fowl (Tables 9 and 10). Six ageable fowl bones occur in *context groups* 10–14, four of which are from mature birds. One sexable tarsometatarsus, lacking either spur or spur scar, is from a hen bird (context 199). The measurements taken of three bones are given in Table 12 — the birds seem to have been comparable in size to those at Montereale Valcellina (Petrucci and Vitri, 1995: 246–7). A proximal tibia exhibits a knife cut, the only butchery mark in this material. The sieved residue also contained an immature tarsometatarsus from a thrush-sized passerine. Bones of domestic fowl are commonly found in deposits of this date, as, for example, at Montereale Valcellina (where they probably had a ritual significance as well) (Petrucci and Vitri, 1995) and Roccagloriosa (Bökönyi, 1990).

Highly comminuted fragments of eggshell are present in the bird material from *context groups* 1–9 (3 fragments) and *context groups* 10–14 (1 fragment).

### **Reptiles and amphibians**

The lizard bones include cranial and postcranial elements, and the species present are probably gecko (Gekkonidae) and/or wall lizard (*Podarcis* sp.). Both of the wall lizard species which occur in the region, the common wall lizard (*Podarcis muralis*) and the Italian wall lizard (*Podarcis sicula*), are particularly tolerant of human proximity (Arnold, Burton and Ovenden, 1978).

The snake bones comprise a few vertebrae and one rib. The morphology of the vertebrae is colubrine (Colubridae), but grass snake (*Natrix natrix*) and dice snake (*Natrix tessellata*) can both be ruled out (Holman, 1991). The small mammals and lizards in this assemblage show the availability of suitable food for snakes.

The tortoise bones are probably Hermann's tortoise (*Testudo hermanni*), since this is the only species native to this area of Italy (E.N. Arnold, pers. comm.).<sup>6</sup> The two bones in this assemblage are a fragment of carapace from *context group* 4 (362) and a scapula from *context group* 14 (195), the latter exhibiting cut marks at the glenoid articulation. Tortoise occasionally occurs in Roman assemblages, either as apparently accidental deaths, as at Populonia (De Grossi Mazzorin, 1985) and Vaste, Fondo Sant'Antonio (Albarella, 1995), or as butchered remains, as, for example, in the votive deposit at Borgo le Ferriere, Satricum (Prummel, 1996). Although tortoise carapace was used as a raw material (for example in construction of lyres), and hence removal of the body of the tortoise might result in incidental cut marks to the bones, the location of the cut marks in this case suggests that the animal was eaten.

The amphibian bones are not identifiable to species.

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<sup>6</sup> Nick Arnold (Natural History Museum, London) kindly identified the tortoise. Sorrentino (1981) has reported the presence of *Testudo graeca* L. at San Giovenale.

### ***Fish bones (AL)***

A number of fish bones was recovered from sieved samples and two fish vertebrae were hand collected (Table 13). The following species and families were identified; eel (*Anguilla anguilla*), sardine (*Sardina pilchardus*), hake (*Merluccius merluccius*), gurnard (Triglidae), scad (*Trachurus trachurus*), sea bream (Sparidae), pandora (*Pagellus erythrinus*), meagre indet. (Sciaenidae), red mullet (*Mullus surmuletus*), mullet indet. (Mugilidae), wrasse indet. (Labridae), corkwing wrasse (*Crenilabrus melops*), Scombridae and flatfish indet. All the species identified were eaten and their qualities have been described by Davidson (1981).

Some of the contexts had a number of samples, but these have been amalgamated on the tables. A few contexts included fish vertebrae that had been burned black, notably in the pits (231–2) with possible votive offerings (209, 218) as well as context 258.

Scales were present in many contexts; most were of the same type, and similar to those of mullet. In contexts 197 and 209 (pits 206 and 232) the mullet vertebrae were closest to golden grey mullet (*Liza aurata*). One of the sea bream vertebrae in 199 (pit 206) was closest to the black sea bream (*Spondyliosoma cantharus*), but the sea breams are difficult to separate on vertebrae alone.

The possible tunny vertebrae need to be confirmed with additional reference material. However, it is clear that they are definitely not skipjack tuna (*Euthynnus pelamis*) or bonito (*Sarda sarda*) and should be compared against the little tunny (*Euthynnus alletteratus*) and other mediterranean species.

The hake vertebrae were from small specimens which could have been caught in inshore waters where they can be found in summer (Wheeler, 1979: 171).

It is of interest that hake (*Merluccius merluccius*), sea bream (Sparidae), gurnard (Triglidae), red mullet (*Mullus surmuletus* and *Mullus barbatus*), grey mullet (*Mugil cephalus*), wrasse indet. (Labridae) and corkwing wrasse (*Crenilabrus melops*) are pictured in art-work at Pompeii (Reese, forthcoming). Bones of sea bream (Sparidae) and mullet (Mugilidae) were found in sanctuary-related deposits at Paestum (Rose, forthcoming).

### ***Bones from possible ritual deposits (AP)***

Several samples came from contexts of possibly ritual nature: pits 231 and 232 from *context group 7* and pit 206 from *context group 12* (see below, pp. 116–18). The bones from these (Table 9) contributed roughly two-thirds of the total assemblage described and all of the sieved bone from *context groups 10–14* (sampling policy, pp. 95–6). Each of the sampled contexts contains some burnt bone but most of the material is unburnt (see below, Table 7).

Of the food species, only fish bones occur in large numbers: several species are present but most of this material consists of scales and unidentifiable fragments. The occurrence of more than one fish species, all at a low frequency, in each context suggests soil manuring as an alternative explanation for their presence.

The remaining species represent merely background contamination, bones from animals living and dying in the local environment. None of the bones of these species show burning.



## CONCLUSION (GC)

Although the samples from the excavated deposits preceding the construction of houses 11 and 12 are relatively small, they provide some valuable information upon the species present within the early settlement and upon aspects of their exploitation. For example, some of the mammal remains throw further light upon the use of pigs in ritual practices, and the wide range of fish represented illustrates a broad dietary diversity. In addition, the non-mammalian remains, in particular, indicate the wild non-food animals to be found in the proximity of the settlement, in some cases no doubt attracted to it by the human activities and their refuse.

## THE MACROSCOPIC PLANT REMAINS (MR)

### INTRODUCTION

The depictions of plants in wall-paintings at Pompeii and Herculaneum have long been used as a source of information about plant species known to the Romans of Campania (Comes, 1879, quoted in Borgogino, 1993; Jashemski, 1979; 1993). Carbonized plant remains were also noted from the AD 79 destruction levels of Herculaneum (Meyer, 1980), while the taking of casts of voids left by decayed roots supplemented by pollen analysis has been used at Pompeii to reconstruct the details of garden planting (Jashemski, 1979; 1993). Investigation of botanical remains from below the AD 79 destruction levels, however, has been very much more limited and has largely been restricted to casual finds of carbonized items during excavation. The excavations of the Anglo-American Pompeii Project at the House of the Vestals (Ciaraldi, 1996) and those reported here (cf. Robinson, 1998) brought the technique of bulk water flotation and sieving for the recovery of macroscopic plant remains to excavations below AD 79 levels at Pompeii. The excavations reported here recovered much botanical material, not just from the Roman phases but also from the pre-Roman phases under houses 11 and 12. The pre-Roman results, mostly from what became the atrium of house 12, are considered here in detail. The pre-Roman phases are taken as those which pre-date the construction of houses 11 and 12.

### METHODS AND RESULTS

Following the success of the trial programme of wet sieving and flotation in 1996, extensive sampling, using 10-litre sample units, was undertaken from the deposits under excavation, including the contexts which pre-dated the standing buildings. A lightweight portable system based around a plastic dustbin was used to process the samples. Each sample was washed through a

10 mm mesh into the dustbin to disaggregate it and to recover larger finds. The contents of the dustbin were then sprayed with a hose-pipe and the water poured off onto a 0.5 mm sieve. This was continued until no more charred plant material could be floated or washed over. The residue remaining in the dustbin was then sieved over a 2 mm mesh. Both residues and flots were dried and the residues were sorted on site. The flots were sorted using a binocular microscope in the laboratory.

The macroscopic plant remains so recovered were identified with reference to collections of the Environmental Archaeology Unit of the University Museum of Natural History, Oxford. The results are listed in Tables 14–16 for carbonized remains (excluding charcoal) and Table 17 for calcium phosphate mineralized remains. The items listed are seeds unless otherwise stated. The carbonized remains have been divided into classes. A few of the remains can be placed in more than one class. For example, *Papaver somniferum* (opium poppy) has been placed in the class of ‘Other Crops and Garden Plants’ on the basis of context, but it also can occur as a weed. Where more than one sample was analysed from a context and the composition of the samples was similar, the results have been combined in the tables. However, where multiple sampling showed variability within a context, for example context 209 (Table 14), the results are given separately for each sample. Nomenclature follows Pignatti (1982). When it has been possible to estimate the minimum number of whole items represented by the fragments found, for example the number of nuts represented by pieces of nutshell, the number has been given in brackets after the fragment total.

Difficulty was experienced with the identification of hulled wheat glumes. The remains were mostly in poor condition, making it hard to differentiate between *Triticum monococcum* (einkorn) and *Triticum dicoccum* (emmer). Interestingly, some apparent *Triticum dicoccum* glumes have very prominent primary keels. It may be possible to refine the identifications once larger and better-preserved assemblages from the site can be studied. At present, the occurrence of *Triticum dicoccum* can be confirmed but the status of *Triticum monococcum* remains uncertain.

## DESCRIPTIVE INTERPRETATION

The results are considered by *context groups* and houses, but under the major headings of ‘early’ (fourth–third centuries BC) and ‘late’ (second century BC to the construction of the houses 11 and 12 in the later first century BC).

### ***Early deposits under house 12 (context groups 2–9)***

The earliest material recovered from house 12 is from context 381, the *context group* 2 worked soil which overlay the prehistoric volcanic ash. The concentration of carbonized remains is surprisingly high, with over six items per litre. They are all seeds of weeds which readily grow amongst arable crops, *Silene gallica* (small-flowered

catchfly) and cf. *Trifolium* sp. (clover) being the most abundant. The seeds are mostly small and it is possible that they were burnt waste from the fine sievings of a cereal crop, a late stage in the cleaning of grain. The weeds also grow in wayside habitats, but if the material had been burnt cut-herbage which had been brought to the site as fodder, more grass remains would have been expected.

A series of samples was examined from a pit sequence belonging to *context group 5*. The samples are listed in Table 14 in stratigraphic order from context 330, the earliest, to context 331, the latest. Although the concentration of carbonized remains is lower, the same range of weed seeds is present. However, the latter are in company with crop remains. Three species of cereal were identified: *Triticum dicoccum* (emmer wheat), hulled *Hordeum vulgare* (six-row hulled barley) and *Panicum millicaceum* (common millet). There was also a slight presence of cultivated legumes (for example, peas, beans) including *Vicia faba* (field bean). Cereal chaff, particularly glumes of *Triticum dicoccum* and *Triticum monococcum* or *dicoccum*, outnumber grain. *Triticum dicoccum* is a hulled wheat and its spikelets were probably heated and then pounded to free the grain. The carbonized remains could largely represent waste from the cleaning of emmer wheat and perhaps other cereals following de-husking.

The material from two contexts from *context group 7* contrasts strongly with the remains from *context group 5*, and it appears to have had an entirely different origin. It came from context 218, a layer within pit 231 which also contained miniature votive ceramic vessels, and context 209, a layer within pit 232, a stratigraphically later pit which also contained votive items. The composition of these contexts is variable, so not all the samples from them have been combined.

Samples 558, 559, 560 and 561 from context 218 all contained relatively little wood charcoal and low concentrations of other charred plant remains. Large cereal grains (that is, wheat and barley rather than millets) predominate, but unfortunately they had mostly been damaged by charring and could not be identified further. However, it was possible to confirm the presence of *Triticum dicoccum* (emmer wheat) and hulled *Hordeum vulgare* (six-row hulled barley). Other carbonized remains include a couple of fragments of possible *Vicia faba* (field bean), some *Vitis vinifera* (grape) pips, a couple of nutshell fragments of *Corylus avellana* (hazel) and a few arable weed seeds.

Sample 562 from context 218 includes much charcoal but few plant remains. There is, however, a piece of carbonized skin of *Punica granatum* (pomegranate). In addition there are pieces of charred vesicular material. It is mostly broken but the outer surface of one fragment has seeds of *Papaver somniferum* (opium poppy) impressed into the surface, showing it to be poppy-seed bread or pastry. While calcium phosphate mineralized seeds are normally derived from faecal material (see below), the occurrence of mineralized seeds of *Papaver somniferum* in this sample (Table 17) is more likely to be related to the high phosphate content of the ash.

Sample 566 from context 218 contained both much wood charcoal and a high concentration of other charred plant remains. There are many cereal grains, with a free-threshing form of *Triticum* sp. (durum or bread wheat) joining the emmer wheat and hulled barley identified from other samples. There are also fragments of pod and seeds from what was probably a single burnt pod of *Ceratonia siliqua* (locust or carob bean), some nutshell fragments of *Juglans regia* (walnut) and *Corylus avellana* (hazel), a pip of *Vitis vinifera* (grape) and a few legume seeds, including *Cicer arietinum* (chick-pea) and *Vicia faba* (field bean). Other charred items include vesicular material containing pips of *Ficus carica* (fig) which possibly represents a burnt fig 'pudding'.

The samples from context 209 show considerable similarity to those from context 218. Sample 556 has a particularly high concentration of charred remains and includes most of the species from sample 566, apart from *Ceratonia siliqua* and the vesicular material. Remains of *Cicer arietinum*, *Juglans regia*, *Corylus avellana* and *Vitis vinifera*, however, are very much more abundant, and the remains of *Vitis vinifera* include entire grapes as well as pips. Two additional fruit are present, *Pyrus communis* (pear), represented by a single pip, and *Punica granatum* (pomegranate), represented by many pips.

Sample 557 was another charcoal-rich part of the context and had an even higher concentration of charred plant remains. The most numerous are nutshell fragments of *Juglans regia*, but most of the species from sample 556 also occur in this sample. Arable weed seeds are present, including *Silene gallica* (small-flowered catchfly).

The results from contexts 218 and 209 strongly suggest that the carbonized remains in the two pits were votive offerings. While individually a collection of burnt nutshells might be interpreted as table waste thrown into a fire and burnt chick-peas interpreted as the result of a kitchen accident, their occurrence together along with items such as intact grapes does not lead to any other plausible explanation. The varied contents of the deposits suggest that many small burnt food offerings were placed in the pits, rather than that one large mixed cremation had been buried in each. Each offering was perhaps no more than a small bunch of grapes, a handful of grain, a pod from a locust tree, or a piece of pastry.

Samples were also analysed from three other contexts from *context group 7*: contexts 258, 248 and 250. The concentration of remains in them was low. The few cereal grains, legume seeds and weed seeds could be from crop processing, some fruit and nut remains could be kitchen or table waste or perhaps even from dispersed burnt votive offerings.

Two contexts were sampled from *context group 8*: contexts 247 and 279. The occurrence of charred mixed cereal grain and glumes, including perhaps both *Triticum monococcum* and *Triticum dicoccum* (einkorn and emmer wheat), along with weed seeds, would be consistent with burnt crop-processing waste. There is a rather greater presence of grain of *Panicum miliaceum* (common millet) than in the earlier samples, but the concentration of remains is still low.

Context 304 from *context group 9* proved to contain a high concentration of carbonized potential arable weed seeds but only a trace of cereal grain, chaff and legumes. Seeds of cf. *Trifolium* sp. (clover) predominate, followed by *Silene gallica* (small-flowered catchfly). Other arable weeds represented by their seeds include *Chenopodium murale* (nettle-leaved goosefoot), *Ornithopus* sp. (bird's foot), *Euphorbia helioscopia* (sun spurge) and *Anthemis arvensis* (corn chamomile). Such a flora would be entirely appropriate to arable fields on the soils around Pompeii. Although there is only a single seed of *Rumex acetosella* agg. (sheep's sorrel), it was of sporadic occurrence throughout the pre-Roman samples and serves to emphasize the non-calcareous nature of the soils that develop from the Vesuvian ash. The assemblage was possibly fine sievings from the cleaning of a cereal crop.

Glumes of *Triticum* cf. *dicoccum* (emmer wheat) comprise over half the items in samples from context 284, the remainder mostly being made up of weed seeds. This context belonged either to *context group 3* or *context group 9*. The glumes are probably cleaning waste following the de-husking of emmer wheat.

### ***Early deposits under house 11 (context group 101)***

The only suitable deposit for sampling was context 679, the backfill of a large quarry pit of *context group 101*. Both carbonized (Table 15) and calcium phosphate mineralized (Table 17) remains were recovered from it. The carbonized remains appear mostly to have been derived from crop processing. Most of the grain is millet, a mixture of both *Panicum miliaceum* (common millet) and *Setaria* cf. *italica* (foxtail millet). The only other grain is a slight trace of hulled *Hordeum* sp. (hulled barley). The chaff, however, is predominantly of *Triticum dicoccum* and *Triticum* cf. *dicoccum* (emmer wheat). Legumes are represented by *Vicia faba* (field bean). There are many weed seeds, particularly from *Silene gallica* (small-flowered catchfly) and *Ornithopus* sp. (bird's foot), almost all of which would have grown readily as weeds amongst the field crops. These remains probably result from a range of activities related to the cleaning of the various crops and the de-husking of the emmer wheat. A few carbonized seeds and a pedicel (stalk) of *Vitis vinifera* perhaps come from the domestic use of grapes.

Calcium phosphate mineralized plant remains occurred in the deposit in addition to the carbonized remains. This type of preservation is particularly characteristic of cesspits, where calcium carbonate is present and the pit retains some sewage in a semi-liquid state. The phosphate is provided by the sewage itself. The survival of mollusc shells in the pit fill shows that the soil of the site was sufficiently calcareous by this date. However, there was no evidence of calcium phosphate infiltration of the deposits within the pit, which suggests that the mineralization occurred elsewhere. The assemblage was typical of sewage, and it is likely that it had been reworked from a latrine elsewhere on the site. The remains preserved were pips of *Ficus carica* (fig) and a few arable weed seeds including *Silene gallica* (small-flowered catchfly). The mineralization tends to favour seeds that are intact. The fig pips could have been swallowed intact and the weed seeds were probably contaminants of flour.

### ***Late deposits under house 12 (context groups 10–12)***

Single samples were analysed from context 266, a pit belonging to *context group 10* and context 119, a *context group 12* pit. The assemblages (Table 16) are similar, with some cereal grain, mostly *Panicum miliaceum* (millet) and some weed seeds, most of which were unidentifiable. The weed seeds, however, include some arable species such as *Chenopodium murale* (nettle-leaved goosefoot), *Euphorbia helioscopia* (sun spurge) and *Lithospermum arvense* (corn gromwell). The assemblages probably derive from crop processing. Some calcium phosphate mineralized pips of *Ficus carica* (fig) from context 266 (Table 17) are probably from reworked cesspit material.

Several samples were analysed from context 199, the fill of pit 206, which belonged to *context group 12* and possibly contained votive deposits. The carbonized remains show some similarity to those from the earlier votive deposits, but they are not so unequivocally ritual in origin. They mostly comprised nutshell fragments and fruit stones/pips including *Juglans regia* (walnut), *Corylus avellana* (hazel), *Ficus carica* (fig), *Vitis vinifera* (grape) and *Olea europaea* (olive). There are also a few cereal grains and seeds of *Lens culinaris* (lentil).

## **DISCUSSION**

This study has shown three main sources for the plant remains in the pre-Roman deposits: burnt waste from crop cleaning, mineralized latrine contents



and burnt votive offerings, mostly of food. There is very little burnt kitchen or table waste. Each line of evidence shows its own particular biases. The crop-cleaning remains tend to be of cereals and arable weed seeds with a few legumes. The mineralized remains are fruit pips and weed seeds that were swallowed whole. The votive offerings give a new insight into diet, for fruit, nuts, grain and legumes were burnt intact. Some are from species which do not readily enter the crop record. It is probably significant that the only finds of free-threshing wheat grains, which do not require parching to remove them from their glumes (husks), are from the votive offerings, whereas the wheat remains from the other contexts are of hulled wheats such as emmer which do require parching prior to de-husking. Indeed, the waste from this process, the glumes, outnumber grains of emmer.

The plant remains show a broad basis of food procurement, bringing together the products of arable fields, garden, orchard, vineyard and managed woodland or trees. The full list comprises: einkorn wheat, emmer wheat, durum or bread wheat, hulled six-row barley, common millet, foxtail millet, chick-pea, field bean, lentil, opium poppy, walnut, hazelnut, olive, fig, pear, grape, pomegranate and locust (carob) bean. All could have been grown locally, and the weed seeds suggest that the arable crops were. Millets tended to be regarded as inferior to wheat or barley in Roman times (Spurr, 1983), but their occurrence here need be no more than a reflection of a mixed agricultural system. Their short growing season made them useful summer catch-crops, for example they could be sown in late June following the harvest of beans. The pods of the locust tree have a sweet pulp when ripe and the seeds can be ground to make a flour. However, the main reason for its cultivation in the mediterranean region in recent times has been to use its pods as animal food, so its occurrence at Pompeii does not necessarily reflect human consumption.

The evidence of crop-processing activity need not imply that the occupants of the site were directly engaged in arable agriculture. However, it does suggest that grain was brought to the site as spikelets that needed to be de-husked and cleaned, probably before hand-milling. This might be regarded as a rather rural activity. In contrast, the occurrence of calcium phosphate mineralized remains from sewage tends to be characteristic of towns. This is because shortage of available space and the increased population density results in the more intensive use of cesspits.

The results from the votive offerings are of considerable interest for the light they throw on ritual activity (below, pp. 116–18), as well as being a source of information on food plants that are less usually preserved. One point of interest is the occurrence of weed seeds as well as food remains. It could be that crop-cleaning debris was sometimes used to fuel the cremation, or that the cereal offerings had a high weed content. However, some of the weeds, for example *Silene gallica* (small-flowered catchfly) and *Anthemis*

*arvensis* (corn chamomile), have attractive flowers. Field observations showed that *Silene gallica* can have capsules of mature seeds on plants that are still flowering. It is possible that some of the offerings were small bunches of corn-field flowers. Taking the speculation further, some of the votive offerings have all the ingredients necessary to fill a cornucopia: a few flowers, a small bunch of fruit, an ear of cereal.

The overall impression given by the results is of similarity between the different pre-Roman phases rather than chronological change. The crop-processing remains were similar from all the phases. There were votive offerings from both the early and the late *context groups*. Calcium phosphate mineralized seeds were, however, absent from the earliest *context groups* and it is possibly significant that the only record of olive was late, from *context group 12*.

Useful comparisons can be made with the Roman botanical evidence from Pompeii. Many of the plant species identified in this study are depicted in wall-paintings in the region around Vesuvius or have been identified from AD 79 destruction material (Borgongino, 1993). The list of food plants given earlier would certainly form a good list of ingredients for the botanical component of some lavish meals by Apicius, but they can also be regarded as mediterranean staples, rather than representing a luxurious diet. Most of the weeds are familiar from the modern flora of the area and seeds of some were also identified from the House of the Vestals (Ciaraldi, 1996). However, important differences are emerging between the pre-Roman and the Roman results from houses 11 and 12, even though most of the detailed analysis of the Roman samples has yet to be undertaken. The cereal-cleaning waste of burnt chaff, grain and arable weed seeds was virtually absent from the Roman phases. This suggests that grain was no longer being processed on the site as it became more fully urban in character. The occupants of the houses instead probably purchased flour or bread, the production of which is attested by the mills and bakeries within the town. Whereas kitchen and table waste was limited to a few grape pips and stalks from the pre-Roman samples, there was a much more general background scatter of carbonized fruit stones and nutshell fragments from the Roman contexts. Mineralized fruit pips were more in evidence from the Roman samples, probably reflecting a greater intensity of occupation.

Some species seem to have increased greatly in importance in the Roman period. There was only a single olive stone from the pre-Roman samples and that was from one of the latest phases, whereas olive stones were some of the most consistently present items in the Roman samples. Olive was almost certainly of major importance for its oil throughout the pre-Roman phases of the site, but if it was not being pressed on the site, there would have been little opportunity for its stones to be preserved. It is possible that the widespread occurrence of carbonized olive stones in the Roman contexts was due to the onset of the consumption of pickled olives, some of the stones being

discarded into hearths. Nutshells of pine nuts were also quite common from the Roman phases, whereas they were absent from pre-Roman contexts. However, the use of stone-pine cones and their seeds in cremated offerings was a major source of carbonized pine nuts in the Roman period. The exotic imports, for example date, which could not have been grown in the region but which has been identified in a few Roman samples, were also not recorded from the pre-Roman phases.

The cremation and burial of votive offerings of food plants were features of both the pre-Roman and Roman phases of the site. However, there were differences between them. The Roman offerings were mostly small discrete deposits which each probably resulted from a single event, whereas there was evidence that more than one burnt offering had been placed in the same pit in the pre-Roman period. The two cremated food plants most commonly found in the Roman votive offerings were figs, which were only represented by a few pips in the pre-Roman offerings, and pine nuts, which, as has been mentioned already, were absent from the earlier period.

The results from the pre-Roman *context groups* under houses 11 and 12 probably represent one of the largest bodies of data for the pre-Roman period of southern Italy. Therefore, it is not surprising that they have added additional species of food plant to the list for the region for this period (Hopf, 1991: 248). However, none of the species recorded is at all surprising. The occupants of the site were undoubtedly using a greater range of plants, although *Vicia ervilia* (bitter vetch) is the only additional species on Hopf's list for iron age southern Italy that might have been expected to occur on the site. Making broader comparisons, the results from Pompeii have given a very good picture of crop plants for a mediterranean settlement of this period.

## THE MARINE SHELLS (JR)

Marine shells were recovered from the pre-Roman phases under house 12 by hand excavation and by sieving the residues from the samples floated for carbonized remains onto a 2 mm mesh. Although 28 10-litre samples were floated, marine shells were found in only three. However, bulk sieving is an efficient way to recover sparse fragments which would not easily be noticed during hand excavation. Three of the six species found came only from the floated residues. The results are listed in Table 18. Nomenclature for molluscs follows Parenzan (1970–4).

The marine shells found were all of species which have been eaten in historic times (limpets) or are still eaten today (the rest). They could all have been gathered from the bay of Naples. All the species were also recorded from contexts in houses 11 and 12 of the first century BC and first century AD. However, the concentration of marine shells was much lower than for the Roman period and they were probably only a very minor part of the pre-Roman diet.

## DISCUSSION

## IMPLICATIONS FOR THE URBAN HISTORY OF POMPEII

The discovery of sixth-century structures precedent to the existing houses of the southeastern quarter of the city has significant implications both for our understanding of the development of the city plan and for the interpretation of the type of settlement of the archaic period. Because much hangs on this finding, it is important to be reasonably confident of the evidential basis. The key item of evidence is the structure with lava-filled construction trenches under the atrium of house 12 (Fig. 25, *context group 3*). Here there can be no doubt of the congruence of its alignment with that of the surviving walls. The associated ceramic material gives a consistent horizon from the mid to late sixth century, but not the fifth century. All the structures found beneath houses 11 and 12, whatever their date, respect the same alignment as the later houses. It might be tempting, as would indeed be traditional, to take the fragments of *pappamonte* wall under the garden of house 11 as an indication of sixth-century occupation, as in the city-wall; but no ceramic evidence has been found to confirm the date, and we must bear in mind the likely reuse of *pappamonte* blocks, perhaps as late as the second century BC. Even so, it is hard to explain the strong residual presence of sixth-century materials in an area with abundant *pappamonte* remains unless we suppose a sixth-century phase.

These findings are borne out by results obtained elsewhere in the insula. Closely comparable archaic material has been found by our colleague Dr Nappo in an undisturbed context under the neighbouring house 10. Similarly, clearing work in a pit in the garden of house 3, to the north of the same insula, has produced a notable scatter of bucchero and sixth-century Greek imports. Short of excavating the entire insula down to natural, we can say that wherever an attempt has been made to explore beneath AD 79 levels, archaic material has emerged, and that wherever previous structures have emerged, they have conformed to the later alignment. There is at least no evidence to conflict with the picture of a sixth-century settlement on the same alignment; and the evidence that has been found is at least as strong as that deployed to date for sixth-century activity elsewhere in the city, which is restricted to *pappamonte* walls (usually without associated archaic materials), and finds of bucchero and contemporary pottery (usually without associated structures).

Accepting, then, that the evidence, partial though it is, has not misled us, what consequences would flow for the early development of the city? We may look in turn, first at the implications for the street layout, and then for the nature of the archaic settlement.

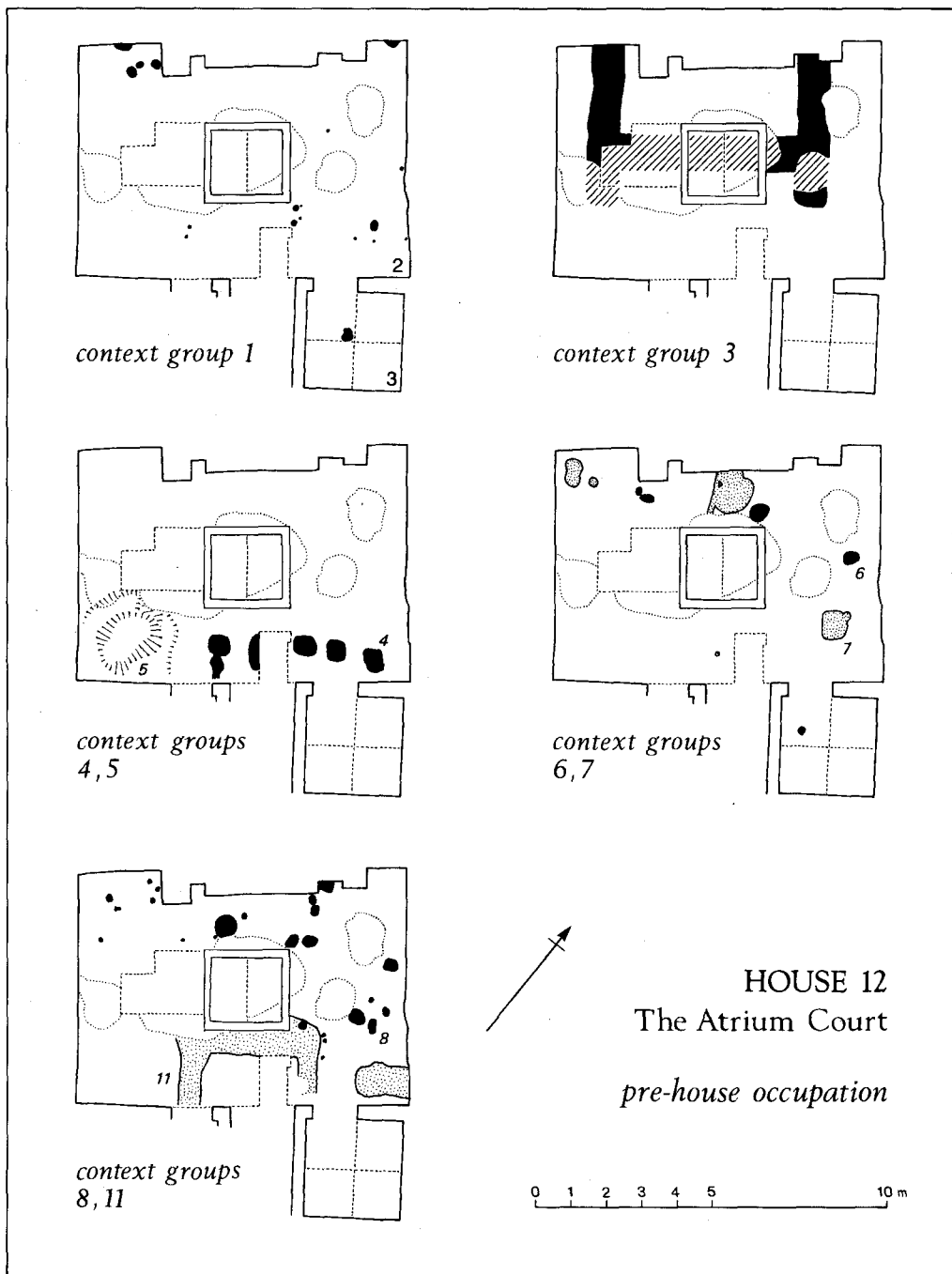


FIG. 25. House 12.2: simplified plans of pre-house *context groups*.



*The archaic street-plan*

Because the discovery of archaic finds in the eastern half of the city runs counter to expectations based on the idea of a gradual spread from an original southwestern nucleus, the initial reaction has been to suggest the presence of isolated shrines or sanctuaries in an otherwise open rural setting. So the 'Etruscan Column' of the house of that name is currently explained as an isolated shrine (Bonghi Jovino, 1984: 371); the archaic finds under the House of Ganymede are attributed to dumping from a nearby unidentified temple (Reusser, 1982: 355); the archaic finds under the House of Lucretius Fronto are assigned to a sanctuary (Peters, 1993: 13 — 'possono essere connessi ... con un santuario rurale in questa zona, su un luogo rimasto aperto per lungo'); and in the case of the present excavation too it has been suggested by some that it was more likely that any structures belonged to a sanctuary rather than to housing. Indeed, the picture of an archaic Pompeii with extensive open areas enclosed within its walls would fit in with settlements of the Sannio hinterland (Carafa, 1997: 28–9). The discovery of a couple of small foundations does not make a city, and a relatively scattered settlement in the eastern part is at first sight the most obvious hypothesis. However, two arguments tell strongly against it and point to a very much more substantial and organized development of the eastern half in the archaic period.

The first consideration is the distribution of archaic finds in the city as a whole. In the last twenty years, there have been a number of attempts to plot the distribution of archaic finds in Pompeii — no easy task, given the summary character of the publication of most subsoil excavations. Reusser, seeking to make sense of the archaic finds from the House of Ganymede (VII.13.4), was able to list fifteen find-spots, two outside the city walls (Reusser, 1982: 67–72), and came to the conclusion that the archaic settlement focused on the area of the Forum, with an extension in Region VI. More recently, Cristofani (1992b; 1996) updated Reusser's plan, underlining the distribution of *pappamonte* walls, of ceramics, terracotta tiles, and of graffiti in Etruscan lettering, confirming the conclusion that the archaic settlement was focused around the Temple of Apollo in the Forum, with outlying sanctuaries at the House of the Etruscan Column and the House of Ganymede (Cristofani, 1996: 119–20). (The absence of archaic finds from the eastern part is emphasized by the casual omission of the House of Lucretius Fronto in the 1992 version, and of House I.13.1 in the 1996 version.) Most recently, Carafa (1997: 26), writing in awareness of the present excavations, replotted the map, allowing for the possibility of at least scattered settlement within the entire walled area from the beginning of the historic period (here too, house I.13.1 has been omitted).

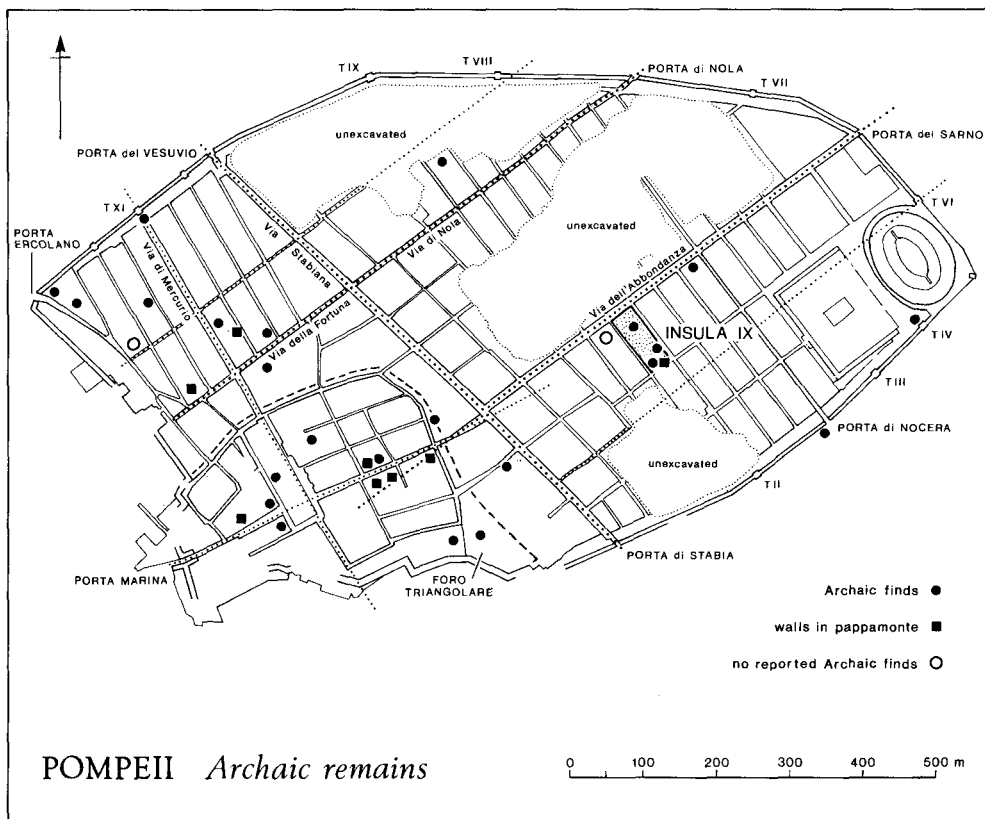
But the key control on any distribution map is to correlate what has been found with the limits of research. The absence of archaic finds can only be significant in those areas where sufficient excavation has been undertaken to

FIG. 26. Distribution of principal subsoil excavations in Pompeii and archaic finds. Planning alignments are emphasized by dotted lines (Via Stabiana, Via del Mercurio, Via della Fortuna, Via di Nola, Via dell'Abbondanza, etc). ● indicates archaic finds; ■ indicates *pappamonte* walls not otherwise dated; ○ indicates absence of reported archaic finds

- Temple of Apollo: Maiuri, 1973 [1943]: 135–60; De Caro, 1986
- Temple of Minerva (Triangular Forum): de Waele, 1998
  - Temple of Isis: Elia, 1970
    - Forum: Arthur, 1986
    - Basilica: Maiuri, 1973 [1951]: 218
    - Terme Stabiane: Maiuri, 1973 [1932]: 43–51
- Walls (northwest), Porta Ercolano, Torre Mercurio: Maiuri, 1929: 230–1, 247
  - Walls (southeast): De Caro, 1985
- I.8.5, 8–9 Casa della Statuetta Indiana: Mostalac Carillo and Jimenez Salvador, 1998
  - I.9.3, 10, 11, 12: Fulford and Wallace-Hadrill, 1998a; 1998b
    - I.13.1: Gallo, 1988
    - V.4.a, Casa di M. Lucretius Fronto: Peters, 1993: 15–16
- VI.1.7, Casa delle Vestali: Bon, Jones, Kurchin and Robinson, 1998: 157
  - VI.1.10, Casa del Chirurgo: Maiuri, 1973 [1930]: 7–8
    - VI.2.4, Casa di Sallustio: Laidlaw, 1993
  - VI.5.17, Casa della Colonna Etrusca: Bonghi Jovino, 1984: 37–9
    - VI.5.9, Casa dei Fiori: Bonghi Jovino, 1984: 75–9
    - VI.6.1, Casa di Pansa: Maiuri, 1973 [1944–5]: 169–71
  - VI.10.6, Casa della Fontana Grande: Maiuri, 1973 [1944–5]: 164
    - VI.10.8: Maiuri, 1973 [1944–5]: 165–9
    - VI.12.1, Casa del Fauno: Bruckner, 1975: 205
- VII.4.62, Casa della Forme di Creta: D'Ambrosio and De Caro, 1989
  - VII.7.2, Casa di Trittolemo: Maiuri, 1973 [1942]: 125–33
  - VII.9.47, Casa delle Nozze di Ercole: Carafa, 1997: 22
    - VII.13.4, Casa di Ganimede: Reusser, 1982
- VIII.2.38/39, Casa di Giuseppe II: Carafa and D'Alessio, 1998
  - VIII.5.2, Casa del Gallo: Maiuri, 1973 [1944–5]: 171–9
  - VIII.5.9: Maiuri, 1973 [1944–5]: 179–80
  - VIII.5.28, Casa della Calce: Maiuri, 1973 [1944–5]: 180–3

reveal them. If we plot known archaic finds against all known subsoil excavations which might have revealed them (Fig. 26), the distribution map changes complexion radically: for there are very few examples of subsoil excavations of sufficient depth which have *not* revealed an archaic presence, or which have not been supposed by the excavator to have done so. Certainly, there are significant cases of doubt: Maiuri (1973) unearthed *pappamonte* walls under a series of houses which he dated to the archaic period without citing associated finds (Fig. 26), and Elia (1970) alleged archaic levels under the Temple of Isis on grounds so vague as to be hard to accept (cf. Reusser, 1982: 369). In view of our findings, it would be particularly useful to have better external dating control on *pappamonte* construction, rather than continuing to assume it is an archaic feature. However, a more critical selection would reduce the archaic presence in the supposed archaic nucleus, not in the eastern half.

In fact the concentration of archaic finds revealed by the distribution map is determined by the history of research, and precisely by excavation



undertaken in the expectation of finding an archaic presence in the 'old' nucleus, and of not finding it elsewhere. Maiuri's desire to find archaic levels, in the context of an already existing hypothesis of an 'Altstadt', led him to investigate houses in precisely this area — legend has it that he offered rewards to his workmen for the discovery of bucchero fragments. Excavations around the Temple of Apollo, the temple in the Triangular Forum, and the significantly named 'House of the Etruscan Column' in Region VI, were all motivated by the search for the archaic city. The location of the current programme of excavations by Carandini's team, astride the 'old pomerium', and in the zone close to the Forum, is equally based on the desire to expose this 'deep' history of the city (Carafa, 1997: 14–15). On the other hand, the rare excavations in the eastern half, apart from those in search of the *pappamonte* archaic city-wall, in the House of Lucretius Frontus, in house I.13.1 and in our own insula, were aimed initially at elucidating the later histories of the houses concerned, and did not anticipate archaic levels.

A cluster of find-spots is not enough in itself to demonstrate a substantial archaic presence in the eastern half. By contrast, our Spanish colleagues excavating in Insula I.8 have not to date reported archaic levels (Mostalac Carillo and Jimenez Salvador, 1998). Nevertheless, it must be said that the arguments for restricting the archaic presence to the western half are methodologically flawed, and that the attempts to explain away any finds in the east as resulting from a scatter of otherwise unattested sanctuaries and shrines in an open landscape look increasingly like special pleading.

The second set of arguments revolves around the logic of the street-grid itself. It is evident that the rectangular grid of the eastern half not only obeys a different logic, but follows a different orientation from the streets of the southwestern nucleus. An important observation by De Caro (1992) reveals that at some point in time a major layout of the street-plan was undertaken, linked to the disposition of the city-wall, its gates and towers (Fig. 26). The basis of the scheme is the Via Stabiana, which runs precisely straight, but aslant to most other roads, following a natural depression in the terrain, from the Porta Stabiana in the south to the Porta Vesuvio. This road is divided precisely into three sections by the two major west–east axes of the Via di Nola (passing through the Porta di Nola), and the Via dell’Abbondanza (passing through the Porta di Sarno), with the result that the eastern half is divided into three broadly equal parallel strips.

What determines the orientation of these west–east axes is not clear. De Caro’s attractive suggestion (1992) is that the new layout was oriented on Sarno itself, the mountain peaks above it, and possibly a sanctuary associated with the source of the river Sarno, at the mouth of which Pompeii stands. But in any case, it is clear that the orientation is deliberate and independent, since it is neither at a right angle to the Via Stabiana, nor continues any orientation to be found in the southwestern nucleus. The fact that the Via dell’Abbondanza changes direction quite markedly outside the Stabian baths, creating a notable triangular piazza, emphasizes that the eastern stretch is not a mere extension of previous alignments. The line of the Via di Nola, on the other hand, is carried back into Region VI (where it changes its modern name to Via della Fortuna), and it is clear that the layout of the blocks of Region VI also presuppose this major redesign of the city.

De Caro’s argument for dating this entire layout to the third century BC, now widely accepted, hinges on the Superintendency excavations, by D’Ambrosio and De Caro (1989), of the Casa delle Forme di Creta (VII.4.62). Here, under the atrium of a second-century house, remains emerged of a fairly ambitious series of banqueting rooms datable, on the basis of ceramics, to the fourth/third centuries. The evidence points to a public, rather than private, structure, of the type of a *hestiatorion* or *prytaneion* on a Greek model. The key argument for dating the layout, for De Caro, is the fact that the *hestiatorion* beneath VII.4.62 respects the north–south alignment

of the Via di Mercurio and the 'old nucleus', whereas the private house that overlies it follows that of the Via della Fortuna and the 'new' layout. This argument cannot in itself be cogent: so long as the Via di Mercurio formed one side of the insula concerned, it would remain possible for buildings within it to take their alignment from it, and not from the Via della Fortuna to the north, even if the 'new' grid was already in place. The alignment of the fourth-century building cannot, of itself, constitute a *terminus post quem*.

The vital contribution to this debate of the structures that have emerged under I.9.12 is the fact that they respect perfectly the 'new' alignment of the road system of the eastern half. Even were we to suppose that in the archaic period the eastern half was only sporadically inhabited, whether with sanctuaries or small farm buildings, it would be an inexplicable coincidence for such a sporadic structure to respect the orientation set by the eastern stretch of the Via dell'Abbondanza had that line not already been established. The natural implication of an archaic structure on this orientation must be that the entire 'new' layout goes back to the sixth century BC. The most economical hypothesis would be that the road layout was contemporary with the establishment of the wall-circuit characterized by *pappamonte* blocks, and that the entire system of gates and towers, as well as the circuit of the walls, has sixth-century precedents.

This hypothesis would still leave room for a gradual evolution of the inhabited area, as envisaged by Geertman (1998). It has long been observed that the blocks east of the Via Stabiana fall into two phases. The first consists of a band of rhomboidal blocks along the Via Stabiana itself, taking their shape from the orientation of the Via Stabiana to east and west, and from that of the Via dell'Abbondanza/Via Nolana to north and south. These blocks are two rows deep in the central section, but diminish to a single file in the north and south sections. The second phase consists of the precisely rectangular blocks normal to the Via dell'Abbondanza which occupy the majority of the eastern sector. The first possibility is therefore that in the sixth century only the first phase of this development had taken place, with relatively dense settlement immediately east of the Via Stabiana, and then scattered houses or agricultural buildings in the fields to the east. Since the alignment of the eastern Via dell'Abbondanza had already been established in this phase, a structure under Insula I.9 that respects that alignment could be partly of a thinly scattered settlement.

This is certainly possible, and if there were other good reasons for wishing to minimize the extent of sixth-century settlement, we may accept it. However, it relies on coincidence: the scattered traces of sixth-century presence just happen to turn up at the three points where excavation has gone deep under the insula, the most substantial of which happens to be well away from the main road of the Via dell'Abbondanza. The alternative strategy is to adopt a much higher chronology for the development of the



city. As we have seen, both Fiorelli and Mau simply assumed that the entire layout of the city went back to the 'Etruscan' period, though this was before the layout of the eastern half was known. Carrington, too, in 1932, when the eastern layout was known and Maiuri's excavations already suggested that the wall-circuit was complete by 500 BC, argued for an Etruscan colony. Ward-Perkins (1974: 119) still dated the major expansion from the old nucleus to the fifth century. As we know from Marzabotto, there is no problem with a city, Etruscan or otherwise, around 500 BC having a layout based on a 'Hippodamian' grid. Such grids were the common currency of Greek colonial foundations in the south of Italy from an early date.

A 'high', sixth-century dating for the eastern layout of Pompeii need not force us back to the hypothesis of a single homogeneous plan for the entire city. In view of the lack of evidence, there is no problem in positing an older nucleus for the 'Altstadt' as early as the Iron Age, which we can attribute, if we wish to chime with Strabo's account, to the local 'Oscans'. In this case, the contribution of the much more ambitious archaic settlement is not to create the 'Altstadt' but the 'new' layout, probably in a series of stages through the seventh and sixth centuries. The anomalies of the street-grid surely do tell a story of gradual development over time. The mistake is to attempt to date the elements of that street-grid from the structures which happened to be standing within it in AD 79. Investigation of the subsoil has shown that the attempt to backdate the supposedly earliest houses, those of Sarno stone, to the sixth century, were wrong. Equally, in numerous cases where excavation of the subsoil has taken place, structures are revealed that pre-date the standing houses, but respect the alignments of the street-grid around it. The conclusion must surely be that the street-grid overall is very much older than the standing structures.

#### *Nature of the archaic settlement*

The context of the Etruscan presence in Campania is now a great deal better understood than when Carrington (1932), Boethius (1932), Sogliano (1937), Patroni (1941) and Maiuri (1973 [1942]: 135–59) debated it during the excavations of the 'ventennio'. At the time, little more was known than the persistent literary tradition of Etruscan presence not only at Pompeii and Herculaneum, but at Capua, Nola, Nuceria and Picentia (near Salerno), and of two great battles with the Greeks, that of 527 against Aristodemus of Cumae, and that of 474 against Cumae and Hieron of Syracuse, which were seen to bracket a period of Etruscan dominance. Since then, excavations by Johannowsky at Capua, by D'Agostino at Pontecagnano (Picentia), by Colonna at Fratte, by Bonghi Jovino at Vico Equense, and at a scatter of other Campanian sites have produced solid and clear evidence of a major Etruscan presence in the region, with its roots in the seventh century, a sub-

stantial upsurge from the mid-sixth continuing into the fifth, and an aftermath at some sites lasting into the fourth.

There is no need here to elaborate on Frederiksen's masterly accounts (1979; 1984) of the pattern of profound cultural exchange between Greek and Etruscan, and the key role played by Campania as the interface zone with Etruria proper. The fluidity of the exchange is what makes earlier debate seem somewhat unreal over whether the form of the 'Doric' temple of the Triangular Forum, the isodomic city-walls, or the layout of the street-grid itself should be identified as 'Greek' or 'Etruscan'. What characterizes the bay of Naples in this period is a complex interaction between native populations, Greek settlers, and an Etruscan presence sufficient to exercise a dominance in the interior up a corridor linking Salerno to Rome, though surely outnumbered by the local population.

This interaction makes it the harder to distinguish archaeologically the various possibilities for Pompeii, from on the one hand a native settlement subsequently refounded and settled by the Etruscans, to a native settlement with various degrees of influence, politically and culturally, both from the Greek settlements to the north and south, and the stronger Etruscan settlements of the interior. Certainly, a persistent scatter of bucchero fragments will not of itself allow us to distinguish the possibilities. The vital historical point is that Pompeii stands at a hinge point between competing external influences, and exploits its ambivalence, whether locals, Greeks or Etruscans are in control.

However, the vital contribution to recent debate lies in Cristofani's publication of the scattered epigraphic material from Campania in the latest fascicle of the *Corpus Inscriptionum Etruscarum* (Cristofani, Pandolfini Angeletti and Coppola, 1996), and in his lucid discussion of its implications for Pompeii (Cristofani, 1987; 1992b; 1996). Etruscan presence cannot be inferred from bucchero and architectural terracottas alone; but coupled with graffiti in Etruscan lettering, with Etruscan name forms and Etruscan language (for example vessels incised 'mi...', 'I belong to so-and-so'), they put Pompeii on a footing with other 'Etruscan' sites like Vico Equense or Fratte. The graffiti from Pompeii are few, limited hitherto to the Temple of Apollo and the Casa del Fauno, but sufficient in Cristofani's judgement to confirm an Etruscophone presence from the sixth to the fourth centuries. Another important feature noted by Cristofani elsewhere is the frequent occurrence of Oscan names in Etruscan lettering with Etruscan terminations, indicating a significant Oscan penetration of the Etruscan élite. In view of this argument, the discovery of a stray Etruscan graffito in the garden of house 11 of Insula 9 gains especial significance (Figs 20.101 and 24). Occurring on a Greek amphora fragment of the fifth (?) century, the closest parallel to the letters PÁPESA is a graffito from Vico Equense of an Oscan name, PAPE SAVFI. Even if it reveals no more than a stray vessel traded by an Etruscophone

native, this find confirms that the pattern we are finding in Region I is consistent with that in the supposedly Etruscan 'Altstadt', or with the cemeteries of Stabia or Vico Equense.

As with so much of the excavation to date of the early levels of Pompeii, what the present investigation can offer is little more than straws in the wind. Sustained exploration throughout the city area will be needed before a credible history of the development of the town can be written. The scanty, but consistent, evidence we have found is enough only to invite a reassessment of the assumption that the development of the eastern street-grid was third century or later; and to invite consideration of the possibility that the Etruscan impact on the development of the town was rather more substantial than that envisaged by recent accounts.

### LATER STRUCTURES AND CHRONOLOGY (FIG. 25)

The reasonable certainty attached to the dating of our earliest, sixth-century structure cannot be matched elsewhere in the sequence. A major problem with the interpretation of our evidence is the lack of closely datable material. This is a reflection in part of the lack of fine-wares, itself a product of the small size of the groups of pottery associated with our sequence, and in part of the lack of well-dated deposits from Pompeii and the region which contain a representative range of the associated kitchen-wares and other domestic pottery. Thus, in the case of the post pits of *context group 4* (Fig. 25), notwithstanding the occurrence of bucchero, it has been the presence of sherds of kitchen-ware and domestic wares not found in the earlier *context group 9*, which has determined the assignment of a later date. We cannot exclude the possibility of a sixth-century date, but, in the absence of freshly broken sherds of datable fine-ware, it is impossible to be certain of the chronology of particular kitchen-wares and domestic wares. The provisional nature of the assigned date should be acknowledged and future research may show comparable kitchen-ware and domestic pottery firmly in association with sixth-century fine-wares. Thus, while the association of bucchero and Attic black-glazed ware has given us confidence to assign a sixth-century date to the beginning of our sequence, it has been the presence of probable central and southern Italian black-glazed sherds, and a range of kitchen-wares and domestic pottery not identified in earlier deposits, which has helped frame a chronology from the turn of the fifth and fourth centuries onwards. Indeed, an important reference point is the mid-fourth-century sherd of Gnathian ware from the lower fills of pit 335 (Fig. 25, *context group 5*) in the southwest corner of the excavated area under house 12 (Fig. 17.29). Although pre-146 destruction levels at Carthage provide a *terminus ante quem* for the appearance of Campana A, we do not have a reliable *terminus post quem*. Thus the occurrence of some

sherds in *context groups* 5 and 7 does not necessarily imply a date after c. 200/150 BC.

The tentative dating of our sequence can be illustrated in two other important contexts. First, the ritual pits 231 and 232 (to be discussed further below) have been dated to between the fourth and second centuries on the basis of the associated miniature vessels. However, the upper and lower dating limits of this type of *microceramica* is by no means assured (cf. Bonghi Jovino, 1984). Generally similar miniature vessels can also be found elsewhere in southern Italy and Sicily, for example in the archaic period. Given an early date, these pits could be associated with our sixth-century structure; if later than the second century BC, there could be an association with the foundation of house 12. A pit containing several *microceramica* vessels in association with piglet bones was found in a not dissimilar location beneath the tablinum of the House of the Vestals (Richardson, Thompson and Genovese, 1997; Bon *et al.*, 1998: 155), while Pedley has noted an association with second century BC contexts at Paestum (1990: 138). Some support for a later, rather than an earlier, date is provided by the presence of a second-century BC coin of Ebusus in pit 232 (p. 85), and a sherd of possible Campana A (but possibly intrusive) in pit 231 (see discussion of ritual, below p. 116).

A second example where our dating can only be provisional is provided by the fragments of walls beneath the garden of house 11, where almost no datable material was discovered beneath them. Two important, and probably interrelated, observations may be made about their structure. All incorporate fragmented blocks of *pappamonte* and Sarno limestone, while two make use of broken ceramic building material (Fig. 19.88–9). In addition all are unmortared, presumably to carry a timber-framed and mud-brick type construction. These factors, combined with the presence of a piece of painted, possible First Style wall-plaster, very probably preclude an archaic date for any or all of them. Rather, a date between the fourth/third and the second centuries BC seems more likely.

This raises the question of whether occupation on our two sites was continuous from the sixth century, and the nature of the relationship with the later standing buildings. In the first place we have no context to which we can assign a fifth-century date, an observation which reflects the absence of stratified fifth-century fine-wares. Thereafter there is a framework for supposing some continuity of occupation in both areas, down to the time of the construction of the standing buildings. Both have provided some structural evidence which precedes the building of the later houses, though this is particularly limited on the site of house 12. Depending on the date and function of the *context group* 4 post-pits (Fig. 25), the presence of the slow-filling of pit 335 (Fig. 25, *context group* 5) suggests an interval when the excavated area beneath house 12 was at least partly open. Otherwise there does seem to be a strong coincidence in the location of the *context group* 11 (Fig. 25) features

in the southeast corner of the excavated area with the earlier, and underlying, *context group* 4 post-pits. The proximity of these successive, east–west alignments with the north wall of room 3 of house 12 is also noteworthy. This connection and the relative centrality of the ritual pits 231 and 232 in relation to the tablinum of house 12 are the only indicators of possible antecedents of house 12, besides the general correspondence in orientation with our earliest structure (Fig. 25, *context group* 3). If we accept that the correspondence in location and alignment of the *context group* 11 east–west features with the north wall of room 3 is not a coincidence, and that the date of the two pits is later, rather than early, we are still left with the question as to how far back in time a building, roughly occupying the site of house 12, may have existed. The scrappiness of our evidence may be partly explained if we suppose that the foundations of the later house coincided with, and therefore destroyed, earlier structural remains. In accepting some break in the fifth century where we have no certainly dated contexts from either area, it can be suggested that a building, or buildings, was present on the site of house 12 from the fourth or third century.

Much the same can be said of the wall fragments in house 11, although the possibility of a later date cannot be ruled out. The correspondence in alignment between wall 438 (Fig. 10) and the north wall of the standing house is striking, and we might suppose that it represented an original property boundary between an earlier ‘house 11’ and its neighbour. Similar continuities are suggested by the alignment of the wall fragments 715 and 539/605 and the north–south wall of house 11, which also coincides with the corner of a projection of the façade into the street. This north–south wall is about equidistant between the east wall of the standing house 1 and the party wall between 11 and 12. The latter may have divided two properties on the site later occupied solely by house 11. While there is no successor to the east–west wall 540, the dwarf, mud-brick wall on the foundations 480 is adjacent to, and parallel with, the mortared footings of lava blocks of the east–west wall 336/354. While the slightness of the mud-brick structure suggests that it may have been an internal wall, in the later, lava-block-built wall there are traces of a doorway at the western end to give access to spaces to north and south. Albeit fragmentary, this evidence suggests the presence of one or two buildings on the site occupied by house 11, from no earlier than the fourth/third centuries. That this may be too early a date is suggested by the presence of a piece of what appears to be First Style wall-plaster from beneath one fragment of wall, and the occurrence of further, small fragments from similar stratigraphic locations elsewhere in 11.5. We should remember, too, that such fragments of wall as we have do incorporate already used pieces of *pappamonte* and Sarno limestone. Despite some continuities between the plan of the standing buildings and its predecessor(s), the arrangement of the latter (house 11) appears very different to the earlier layout(s).

We have closed the reporting of the sequence beneath house 12 with the deposition of primary make-up layers for the construction of that house (*context groups* 13–14). These contexts are earlier than the cutting of the construction trenches for the walls. Some of the pottery, notably the lamp fragments, associated with these *context groups* is clearly of first-century BC date. In particular there is a large piece of a Dressel 3 lamp from *context group* 11, well sealed by the dumps cut by the construction trenches of the house. In general the latest, pre-house contexts produced a number of amphora, coarse- and fine-ware fabrics and types, such as Eastern *sigillata* A and Pompeian red ware not represented earlier in the sequence (Figs 21–2).

## ECONOMIC LIFE

The evidence from the charred plant remains has been very helpful in the characterization of the occupation associated with the pre-Roman sequence. Robinson has noted the considerable presence of the burnt waste from crop cleaning throughout the pre-house sequence from the sixth century onwards (from *context group* 9). Examples of emmer wheat, bread wheat, common and foxtail millet, chick-pea and field bean have all been recorded from a variety of contexts. The waste, in particular, points to the importance of agricultural activity in the lives of the inhabitants of this quarter of Pompeii. Whether the cultivation of the cereals and legumes was carried out within, as well as without, the city-walls is uncertain, given the nature of the evidence available to us. The presence of the worked soil, which contains pottery ranging in date down to the fourth/third centuries, indicates a period of cultivation within the excavated areas. Although the latter remains a feature of Pompeian life down to the destruction of AD 79, the strong arable complexion, as opposed to the cultivation of olives, vines, fruit trees, appears to be a distinctive feature of the earlier life of the city.

The assemblage of faunal remains is small, but the range and ratio of different species, especially pig, sheep/goat and cattle, are not exceptional when compared with those from other sites of similar date from central and southern Italy. Most of these animals died young, which, in the case of sheep/goats, suggests they were kept for their meat, rather than for dairy products or wool, though weaving was almost certainly carried on within the city in the early period (*context groups* 1–9) (below). It has been suggested (above, p. 89) that, given the rarity of the remains of mature animals, breeding, particularly in the case of pigs, may have taken place away from the city. Such a suggestion, which may point to the specialized production and distribution of meat, contrasts with the interpretation of the botanical remains discussed above.

The range of protein sources was extended by the consumption of fish, of which some dozen species are represented in *context groups* 1–9 (but not



shellfish, which remained rare). There is evidence for the consumption of tortoise from early and late contexts. Among the non-mammalian bone, the rarity of domestic fowl, relatively much more abundant from the first century BC onwards in contexts associated with our houses, deserves comment. Overall, the low incidence of animal bone and fish suggest that neither contributed significantly to the diet of the inhabitants of this quarter of the city.

The importance of agricultural activities, such as the cultivation and processing of cereals and legumes, contrasts with the poverty of material culture other than ceramics. The presence of loom weights from *context groups* 5 and 7 suggests the practice of weaving within the city from at least the fourth/third centuries onwards, but the rarity of other artefacts until the latest *context groups* 11–13, running up to the construction of house 12 in the later first century BC, not only points to a low level of material consumption, but also, by implication, a limited range of specialization. The two loom weights apart, only two bronze fragments, one fragment of iron, one unidentified bronze coin, and one glass bead were associated with the earlier *context groups* 1–9. Given that we do not know the catchment from which the rubbish deposited in our features was drawn from, either in the pre-house, or in the Republican and Imperial periods, the contrast in the range and volume of material culture with that from the later periods in houses 11 and 12 (to be published in our second report) is very striking.

The picture that is painted by the botanical and material culture of the city before the first century BC is that of an agricultural community, rather than one specializing in a range of crafts, or other similar activities. Weaving may be an exception in terms of scale of activity, not least because the marking of the loom weights implies specialized, rather than household, production. This in turn suggests manufacture in some quantity.

## RITUAL DEPOSITS

In the course of excavation three pits (206, 321 and 232) suggested themselves as possibly ritual. Their fills were very different from those of, say, pits 335 or 678 which contained a small quantity of pottery, animal bone and charred botanical remains. The combination of artefacts, faunal and botanical evidence allows us to reconstruct a complex pattern of activity, even if the evidence that we have represents a snapshot of a far wider range of practice within the city. Pit 231 contained eight miniature votive vessels (*micro-ceramiche*). The fill also produced one loom weight (Fig. 23.2), and, perhaps intrusively, a few sherds of pottery including a possible sherd of Campana A. Much of the soil contents of the pit were wet-sieved and the analysis of the animal and fish bones along with the botanical remains derived from this process as well as from hand-digging confirms that this pit did contain one or a series of special deposits. Associated with the partial remains of a

neonatal pig, some of whose bones had been burnt, was a wide range of charred plant remains including those of whole fruit (pomegranate, grape), as well as the pips of fig and grape. In addition, material was recovered which has been identified as poppy-seed bread with seeds of opium poppy impressed into the surface, as well as fragments of pod and seeds of locust or carob bean, shell fragments of walnut, hazel and a few legume seeds such as chick-pea and field bean. Overall, large cereal grains of wheat and barley predominated with their associated weed seeds. The presence of the weed seeds of attractive flowers is explained by Robinson as possible evidence for the offering of bunches of cornfield flowers. The pit also contained a number of fish bones (some burnt), from a variety of species, as well as rodent and non-mammalian bones, of which only a very few can be identified to species. While the presence of the latter may have a perfectly natural explanation, the deposition of the other materials appears intentional. On the basis that individual samples produced different assemblages of fruits, legumes and cereals, Robinson suggests that we have a series of individual offerings, possibly correlating with the number of miniature vessels present. These may have been made on one, or more occasions; the latter possibility reinforced by the presence of a separate pit (232), which cut pit 231. In understanding the process of the ritual as a whole, we can envisage the offering of both whole fruits and handfuls of cereals, as well as the remains of the neonatal pig. The latter was incomplete, but the presence of knife marks on some of the bones suggests that it had been partly eaten. Although only some of the bone showed evidence of having been burnt, charring was common to all categories present, except the rodent and non-mammalian remains. The burning of the offerings took place after some, at least, of the piglet had been consumed, with some disposal of food debris elsewhere than in the pit. How far the offerings are representative of what was raised, grown and harvested by those involved in the ritual is unclear. Except for animals and fish, where other deposits have extended the range of species, there is some correspondence between the range of fruits, cereals and legumes deposited in pit 231 and elsewhere in pre-house contexts.

The evidence for repetitive offerings is strengthened by pit 232, which cuts through the edge of 231. This later pit also had a high concentration of plant remains, including most of the species recorded from pit 231. Fragments of walnut and hazelnut, whole grapes as well as grape pips, and chick-pea were particularly well represented, while pomegranate was represented by many pips in one sample, where pear was also present. There were, however, very few animal and fish bones in this pit, which also contained one bronze coin of Ebusus of second-century BC date. The combination of this piece of dating evidence from pit 232 and the possible Campana A sherd from pit 231 may indicate that both are relatively late in the sequence below house 12.

One other pit (206) from later in the sequence (*context group* 12) may contain the remains of sacrifice and associated feasting and ritual. The bone was almost entirely that of pig, with the remains of at least two or three animals represented with evidence of several cut marks. Although only a small proportion of the skeleton was represented in each case, a number of bones had been burnt. Associated with these remains was one illegible bronze coin and a more limited range of cereals, legumes, fruits and nut than was recovered from pits 231 and 232.

That there is further evidence of ritual within the excavated area of 12.2 is strongly implied by the discovery of another miniature vessel beneath the south wall of the later, pseudo-impluvium. Although it was not possible to excavate this, the association with much charred material and some burnt pig bone is highly suggestive.

While most of our evidence in support of ritual derives from the botanical and faunal evidence, we should also note the presence of a coin in two of our three pits, and of a loom weight in the third.

The contrast with the evidence of votive offerings in the Roman period in houses 11 and 12 is striking. There we find an incidence of sheep, rather than pig, and, most notably, of cockerel in association with, most abundantly, charred fig and stone-pine nuts (the latter entirely absent from the pre-house sequence) (Fulford and Wallace-Hadrill, 1998b: 102–5).

## FOOD REMAINS AND POPULATION DENSITY

It is possible for something to be said about the density and character of the town in the period as a whole before the building of houses 11 and 12. Robinson has noted the presence of latrine waste in the form of calcium phosphate mineralized seeds from *context groups* 7, 10, 12 and 101, that is from contexts dating from the fourth–third centuries BC onwards, but not from the earliest contexts. In comparison with the carbonized remains, the incidence of such mineralized seeds is low, especially when contrasted with the later occupation associated with the lives of houses 11 and 12 in the first centuries BC and AD. This type of mineralization is characteristic of cesspits where calcium carbonate is present, and the pit retains some sewage in a semi-liquid state (Robinson, above, p. 99). Such occurrences are characteristic of towns, where a combination of a shortage of space and increasing population density leads to a more intensive use of cesspits. The low incidence of such seeds throughout the pre-Roman sequence implies, relative to the Republican and Imperial periods at Pompeii, a lower density of population than later.

A lower population density relative to the later city strikes a chord with the evidence of the rodents present in the pre-Roman sequence. Wood or yellow-necked mice, which favour habitats with at least some vegetation cover,

if not a more wooded environment, occur throughout the pre-Roman sequence beneath houses 11 and 12 down to the first century BC. Along with the low incidence of mineralized seeds as an indicator of urban population density, the character of the evidence of the rodents points to a lowish density compared with later, and an environment which is not crowded with buildings. All of this sits well with the agricultural complexion painted by the botanical evidence. Although we cannot be certain that inhabitants in the southeast quarter of Pompeii in the period before the second/first centuries BC were farming, rather than simply processing crops grown by others elsewhere, this is a reasonable assumption to be tested by future investigation within the city. We should also note the possibility that, on the present, admittedly small, amount of evidence, the inhabitants were not raising their own animals.

Our sequence ends at the point when the preparatory work for the construction of house 12 was beginning, and when major changes were taking place on the site of the adjacent property. Several indicators of significant change also occur among the finds and environmental evidence from the latest *context groups*. These include a greater range of pottery, with the first appearance of types of fine-ware, amphorae and coarse-wares more commonly associated with the second half of the first century BC, the greater incidence of non-ceramic finds, the appearance of domestic fowl, and the first record of olive. All of this points to a changing tempo in the life of this quarter of the city in the first century BC.

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TABLE 1. Quantification of pottery.

FABRIC	A			B			C			
	no.	%	wt	no.	%	wt	no.	%	wt	%
<b>AMPHORAE</b>										
miscellaneous	9	4	275	22	12.5	796	91	9	3,770	20.5
Dressel I	-	-	-	-	-	-	1	-	115	*
Cretan	-	-	-	-	-	-	1	-	70	*
Aegean	-	-	-	-	-	-	2	-	110	*
amphora/jug	10	4	190	68	8.5	805	125	9	2,754	15
<b>TABLE-WARES</b>										
miscellaneous	23	10	201	102	9	1,533	82	18	1,118	6
painted wares	-	-	-	1	*	2	13	*	169	1
<b>COARSE-WARES</b>										
miscellaneous	108	47	1,138	416	52	4,369	665	50.5	7,965	43
Pompeian red ware	-	-	-	-	-	-	4	-	100	*
<b>FINE-WARES</b>										
bucchero	29	12.5	197	29	9	186	28	2	240	1
Attic ware	2	*	13	-	*	-	5	-	41	*
Etrusco-Corinthian ware	-	-	-	-	-	-	3	-	7	*
Gnathian ware	-	-	-	1	*	3	-	*	-	-
black gloss	19	8	52	80	10.5	463	119	9	616	3
buff wares	17	7	68	17	3	62	34	*	106	*
<i>sigillata</i>	-	-	-	-	-	-	5	-	24	*
other	9	4	22	7	1	16	71	*	151	*
<b>DOLIA</b>	-	-	-	3	*	207	5	2	765	4
<b>LAMPS</b>	-	-	-	-	-	-	8	-	19	*
<b>PREHISTORIC</b>	4	1.5	40	11	1.5	200	18	2	338	2
<b>TOTAL</b>	<b>230</b>	<b>98*</b>	<b>2,196</b>	<b>757</b>	<b>98.5*</b>	<b>8,642</b>	<b>1,280</b>	<b>97.5*</b>	<b>18,478</b>	<b>95.5*</b>



TABLE 2. Number of identified specimens (NISP) for each species and anatomical elements present. Figures in brackets are the number of elements that belong to the partial skeleton found in context 218 which is included in the main number.

	Context group 101				Context groups 1-9				Context groups 10-14				Unphased pre-house 12.2				
	Pig	Sheep/ goat	Pig	Sheep/ goat	Pig	Sheep/ goat	Cattle	Equid	Dog	Pig	Sheep/ goat	Cattle	Equid	Dog	Pig	Sheep/ goat	Roe deer
antler	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
cranium	2	-	5 (1)	-	-	-	-	-	-	5	4	2	-	-	1	1	-
maxilla	1	-	1	2	-	-	-	1	-	4	-	-	-	-	1	-	-
tooth-upper	-	-	1	3	3	1	-	-	-	4	3	-	1	-	-	-	-
tooth-lower	-	1	21 (4)	1	2	1	2	1	1	22	2	-	1	1	-	-	-
mandible	-	-	3	-	-	-	-	7	1	3	-	-	-	-	-	-	-
atlas	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
axis	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
scapula	2	-	1	-	-	-	-	-	-	1	2	-	1	-	-	-	-
humerus	-	-	1	3	-	-	-	-	-	6	1	-	-	-	-	-	-
radius	-	-	2 (1)	1	-	-	-	-	-	3	1	-	-	-	-	-	-
ulna	-	-	1 (1)	-	-	-	-	-	-	2	-	1	-	-	-	1	-
metacarpal	-	-	-	1	2	-	-	-	-	1	-	-	-	-	-	-	-
pelvis	-	-	3 (3)	1	-	-	-	-	-	2	1	-	-	-	-	-	-
femur	-	1	5 (3)	2	-	-	-	-	-	4	2	-	-	-	-	-	-
fibula	-	-	-	-	-	-	-	-	-	3	-	-	-	-	1	-	-
tibia	1	-	4 (2)	5	-	-	-	-	-	4	1	-	-	-	-	-	-
astragalus	-	-	1 (1)	1	-	-	-	-	-	1	-	-	-	-	-	-	-
calcaneum	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	-	-
metatarsal	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-
metapodial	-	-	1	-	2	-	-	-	-	1	-	-	-	-	-	-	-
prox. phalanx	-	-	3 (1)	1	-	-	-	-	-	4	1	-	-	-	-	-	-
med. phalanx	-	-	-	-	-	-	-	-	-	2	1	-	-	-	1	-	-
dist. phalanx	-	-	2 (2)	1	-	-	-	-	-	1	-	1	-	-	-	-	-
lat. phalanx	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
rib	-	-	2 (2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
vertebra	-	-	13 (13)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>7</b>	<b>2</b>	<b>71 (34)</b>	<b>23</b>	<b>9</b>	<b>8</b>	<b>3</b>	<b>3</b>	<b>79</b>	<b>21</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>6</b>	<b>2</b>	<b>1</b>	

TABLE 3. Fragment sample of mammal bones.

Key: very small – dog-cat-rabbit size animal; small – sheep/goat-pig size animal; large – cattle-horse size animal.

			<i>Context groups</i>				
			101	1-9	10-14	Unphased early	
Number of identified specimens			9	114	108	9	
Rib	very small		-	7	3	-	
	small		1	5	22	3	
	large		-	-	2	-	
Vertebra	small	cervical	-	1	8	2	
		lumbar	1	3	5	1	
		thoracic	-	2	4	-	
		caudal	-	-	1	-	
		indeterminate	-	2	6	-	
	large	lumbar		-	1	-	-
				-	-	-	-
Unidentifiable	long bone fragment of small animal		1	11	19	2	
	long bone fragment of large animal		-	1	7	-	
	indeterminate		1	43	46	4	
<b>TOTAL</b>			<b>13</b>	<b>190</b>	<b>231</b>	<b>21</b>	
<i>% identifiable to bone</i>			85	71	69	71	
<i>% identifiable to species</i>			69	60	47	43	

TABLE 4. Mortality data for pigs, sheep/goats and cattle.

Key: Sources for the ages and tooth wear stages are: PIG – Bull and Payne, 1982; SHEEP/GOAT – Bullock and Rackham, 1982; CATTLE – Silver, 1969; TOOTH WEAR – Grant, 1975; 1982. All ages are regarded as relative.

**PIG**

Dentition:

Tooth	Approx. age	Context group 101			Context groups 1-9			Context groups 10-14		
		Absent	Present	Wear stage	Absent	Present	Wear stage	Absent	Present	Wear stage
M1	-7-11 m	-	1	-	-	-	-	-	1	-
M2	7-11+m	1	-	-	-	1	d	-	-	-
P4-2	11-19 m	-	-	-	-	1	-	-	6	ce
M3	19-23 m	-	-	-	1	1	-	-	1	-

Fusion:

Bone	Part	Approx. age	Context groups 101		Context groups 1-9		Context groups 10-14	
			Not fused	Fused	Not fused	Fused	Not fused	Fused
scapula	d	11-19	1	-	1	-	1	-
radius	p	11-19 m	-	-	1	-	-	1
medial phalanx	p	19-23 m	-	-	-	-	2	-
proximal phalanx	p	19-23 m	-	-	-	2	2	1
tibia	d	19-23 m	-	-	-	-	2	-
metapodial	d	23-31 m	-	-	-	-	1	-
femur	p	31-35 m	-	-	2	1	-	-
calcaneum	p	31-35+ m	-	-	-	-	4	-
ulna	p	31-35++ m	-	-	1	-	1	-
femur	d	31-35++ m	-	-	-	-	1	-
tibia	p	31-35+++ m	-	-	2	-	1	-

**SHEEP/GOAT**

Dentition:

Tooth	Approx. age	Context group 101			Context groups 1-9			Context groups 10-14		
		Absent	Present	Wear stage	Absent	Present	Wear stage	Absent	Present	Wear stage
M1	-12 m	-	-	-	1	1	-	-	-	-
M2	14 m	-	1	e	-	2	-	-	-	-
M3	36 m	-	-	-	-	-	-	-	1	-

Fusion:

Bone	Part	Approx. age	Context group 101		Context groups 1-9		Context groups 10-14	
			Not fused	Fused	Not fused	Fused	Not fused	Fused
humerus	d	-12 m	-	-	-	1	-	1
radius	p	-12 m	-	-	-	1	-	-
medial phalanx	p	14.5-35 m	-	-	-	-	-	1
proximal phalanx	p	35 m	-	-	-	1	1	-
femur	p	36-47 m	-	1	-	-	-	-
tibia	p	48-60 m	-	-	1	-	-	-

**CATTLE**

Dentition:

Tooth	Approx. age	Context groups 1-9		
		Absent	Present	Wear stage
M1	5-6 m	-	2	-
P2	24-30 m	-	1	-

Fusion:

Bone	Part	Approx. age	Context groups 1-9	
			Not fused	Fused
metapodial	d	24-36 m	1	-

TABLE 5. Butchery and cut marks on mammal bones.

Species	Bone	Description	Context group	Context	Bone no.
<b>Context group 101</b>					
pig	cranium	cut across bulla tympanicum	101	679	1650
pig	axis	cut across caudal face; rough cut so cranial/ventral part remains	101	679	1643
unidentifiable	indeterminate	cut mark on surface	101	679	1651
<b>Context groups 1-9</b>					
pig	radius	knife cut mark towards proximal end	7	218	1605
pig	ulna	knife cut mark by articular surface	7	218	1606
sheep/goat	humerus	lateral cranial part of distal epiphysis removed	5	329	1587
sheep	radius	dorsal part of proximal fragment removed	9	336	1268
sheep/goat	astragalus	cut/ground flush on medial and lateral sides	7	191	1225
cattle	metacarpal	cut at distal end of small proximal fragment	7	232	1582
small	rib	cut at one end	9	336	1268
small	vertebra – lumbar	cut at one end	5	227	1322
small	vertebra – lumbar	cut just below socket	5	227	1323
small	indeterminate long bone	deep v-notch	2	130	1313
unidentifiable	indeterminate	two cut marks on edge of fragment	5	301	1262
<b>Context groups 10-14</b>					
pig	pelvis	cut across ilium and ala	14	196	1556
pig	calcaneum	slice removed from proximal plantar area and cut across articulation	12	190	1382
pig	calcaneum	articular surface removed	14	195	1576
pig	proximal phalanx	proximal/volar part removed, distal dorsal and volar parts removed	13	186	1212
sheep/goat	scapula	cut, at distal end, across neck	11	102	1251
small	rib	cut at one end	12	201	1191
small	rib	cut at one end	12	201	1192
small	rib	cut at one end, diagonally	11	102	1248
small	rib	cut at one end	13	236	1294
small	rib	cut at one end	12	190	1368
small	rib	cut at one end	11	189	1438
small	rib	cut at one end	14	085	1522
small	vertebra – cervical	cut, only cranial part of barrel remains	12	190	1376
small	vertebra – cervical	split – c. 45% remains	14	085	1496
small	vertebra – thoracic	spine removed	12	197	1343
small	vertebra – thoracic	split – c. 50% remains, caudal ventral part removed	14	195	1568
small	vertebra – lumbar	split – c. 95% remains	12	197	1342
small	vertebra	split – c. 50% remains	12	197	1344
unidentifiable	indeterminate	chopped	14	195	1592

TABLE 6. Measurements of mammal bones.

Bone	Fusion	1.	2.	3.	4.	Context group	Context	Bone no.
<b>PIG</b>								
upper third molar		29.3	17.3			2	19.12.2 *130	1317
radius	PF			19.9		12	19.12.2 *201	1199
ulna		18.0	31.0			14	19.12.2 *195	1579
ulna	PNF	21.2	34.6	25.4		14	19.12.2 *195	1580
metacarpal IV	PF	18.5				11	19.12.2 *189	1442
astragalus		33.8	19.4			13	19.12.2 *186	1210
proximal phalanx	PF DF	15.8	12.0	13.1	29.3	5	19.12.2 *187	1455
proximal phalanx	PF DF	15.6	13.0	14.3	29.4	7	19.12.2 *191	1222
<b>SHEEP/GOAT</b>								
scapula			12.5			11	19.12.2 *102	1251
radius	PF	32.1	28.6	16.3		9	19.12.2 *336	1268
metacarpal	PF	21.7	15.9			4	19.12.2 *362	1354
femur	PF	43.6	21.1			101	19.11.5B *679	1645
metatarsal	PF	20.8				13	19.12.2 *184	1181
proximal phalanx	PF DF	11.2	8.6	9.7	36.0	4	19.12.2 *343	1260
proximal phalanx	PNF DF		9.3	10.4		11	19.12.2 *224	1395
medial phalanx	PF DF	13.1	10.4	10.7	22.5	13	19.12.2 *186	1217
distal phalanx		30.4	24.3	5.2		2	19.12.2 *198	1367
<b>CATTLE</b>								
metacarpal	PF	67.0	38.3			7	19.12.2 *232	1212
<b>EQUID</b>								
scapula	DF	33.7				14	19.12.2 *082	1509
<b>CANID</b>								
mandible		21.8/8.6	21.2	25.5	9.7/7.2	2	19.12.2 *386	1284

**KEY:** All measurements are given in millimetres. The recommendations of von den Driesch (1976) have been followed whenever possible and the relevant abbreviations are indicated below.

third molar	1.	length of M3, measured along the alveoli on the buccal side
	2.	breadth of M3, measured along the alveoli on the buccal side
scapula	1.	breadth of the glenoid cavity (BG)
	2.	smallest length of the neck (SLC)
radius	1.	breadth of the proximal end (Bp)
	2.	breadth of the proximal articular surface (Bfp)
	3.	depth of the proximal end
ulna	1.	breadth of the proximal articular surface (BPC)
	2.	depth across the Processus anconaeus (DPA)
	3.	smallest depth of the olecranon (SDO)
metacarpal & metatarsal	1.	breadth of the proximal end (Bp)
	2.	depth of the proximal end (Dp)
femur	1.	breadth of the proximal end (Bp)
	2.	depth of the caput femoris (DC)
astragalus	1.	greatest length of the medial half (GLm)
	2.	depth of the medial half (Dm)
proximal & medial phalanx	1.	breadth of the proximal end (Bp)
	2.	smallest breadth of the diaphysis (SD)
	3.	breadth of the distal end (Bd)
	4.	greatest length of the peripheral half (Glpe)
distal phalanx	1.	diagonal length of the sole (DLS)
	2.	length of the dorsal surface (Ld)
	3.	middle breadth of the sole (MBS)
mandible (canid)	1.	length and breadth of the carnassial, measured at the cingulum
	2.	length of the carnassial alveolus
	3.	height of the mandible behind M1, measured on the lingual side and at right angles to the basal border
	4.	length and breadth of M2, measured at the cingulum

TABLE 7. Relationship of burnt and non-burnt bone.

MAMMALS	<i>Context groups 1-9</i>			<i>Context groups 10-14</i>			
	218	258	283	186	197	199	236
number of fragments	41	22	6	14	18	12	11
number burnt	4	4	1	1	5	6	1
% burnt	9.8	18.2	16.7	7.1	27.8	50.0	9.1

RODENT AND NON- MAMMALIAN	<i>Context groups 1-9</i>				<i>Context groups 10-14</i>	
	209	218	247	258	197	199
number of fragments	20	81	5	8	34	93
number burnt	2	2	1	4	4	7
% burnt	10.0	2.5	20.0	50.0	11.8	7.5



TABLE 8. Samples of fourth- to first-century BC date from Italy.

Site	Date	Site type	Fragment sub-sample	Pig	Sheep/goat	Cattle	Other species present	References
Pompeii	4-3 (+6)		112	70	22	8	equid (8), dog (3), ?roe deer (1)	
Pompeii	4-3 (+6)		78	56	32	12	As above. This excludes the partial skeleton of the neonate piglet.	
Pompeii	2-1		104	76	20	4	equid (3), dog (1), ?roe deer	Barker and Clark, 1995;
Campochiaro	Sannite	sanctuary	671	72	28	<1		Lloyd <i>et al.</i> , 1995
Carmineo ai Marnesi, Naples	2-1	?domus	37	59	41	0	goose (1)	King, 1994
Cerveteri	530-490	settlement + 'industrial'	472	29	34	37	equid (4), dog (16), red deer (3), bird (2), fish (1), shell (7)	Clark, 1987-8; 1993
C36	Sannite	sanctuary	222	46	48	6	dog (4), roe deer (3), hare (1), bird (1), rodent (3)	Barker and Clark, 1995;
Gravina phase VI	4-3	settlement	81	20	57	23	red deer (2)	Lloyd <i>et al.</i> , 1995
Gravina phase VII	3-early 2	settlement	4	0	100	0		Watson, 1992
Gravina phase VIIIa	late 2-1	settlement	194	23	58	19	red deer (12), fallow deer (1), roe deer (3)	Watson, 1992
Matrice	Sannite	settlement	69	38	57	6	roe deer (1)	Barker and Clark, 1995;
Monte reale Valcellina	late 2-early 1		1,163	53	46	<1		Lloyd <i>et al.</i> , 1995; Clark, forthcoming
Monte Vairano	late 4	settlement	39	41	18	41	hare (1), domestic fowl (646)	Petrucci and Vitri, 1995
Monte Vairano	3-2	settlement	155	30	29	41	horse (6)	Barker and Clark, 1995;
Narce (phase IX)	4-3	industrial	51	27	57	16	horse (2), dog (1), tortoise (1), rodent (4)	Barker and Clark, 1995;
Narce (phase X)	3-2	levelling, terracing	26	8	58	35	dog (2)	Lloyd <i>et al.</i> , 1995
Pietrabbondante	Sannite	sanctuary	102	49	18	33	bird (29)	Barker, 1976
Pomarico Vecchio	4	settlement	c. 714	c. 24	c. 51	c. 25	dog (c. 37), red deer (2), hare/rabbit (3)	Barker and Clark, 1995;
								Lloyd <i>et al.</i> , 1995
								Aimar, 1997

TABLE 8. Samples of fourth- to first-century BC date from Italy — (cont.).

Site	Date	Site type	Fragment sub-sample	Pig	Sheep/goat	Cattle	Other species present	References
Pompeii Forum	4-3		478	35	18	47	horse (2), dog (18), donkey, red deer	King, forthcoming; 1994
Pompeii Forum	2		32	66	19	16	dog (1)	King, forthcoming; 1994
Pompeii Forum	late 2-early 1		80	65	33	2	weasel, house mouse, ?Spanish mouse, rat, edible dormouse	King, forthcoming; 1994
Pompeii Forum	early 1		415	50	39	11	dog (17), rat	King, forthcoming; 1994
Pompeii Forum	1		1,478	66	20	14	horse (9), dog (13), cat, red deer, roe deer, hare, weasel, hedgehog, rat, water vole	King, forthcoming; 1994
Populonia	3	settlement	1,988	47	43	10	roe deer (9), wild boar (2), chicken (7), fox (2), hare (12), <i>Columba</i> (5), <i>Anas</i> (3), bird (8), tortoise ( <i>T. hermanni</i> ) (4), fish (13), sepia (1), mollusca (59)	De Grossi Mazzorin, 1985
Pyrgi		ritual	106	70	0	30	badger (44), <i>Athene noctua</i> (2), <i>Corvus monedula</i> (8), <i>Bufo viridis</i> (31), <i>Rana</i> (7), <i>Bufo bufo</i> (7), bird (6)	Cardini, 1970
Roccagloriosa	4	urban	1,698	17	48	36	horse (14), donkey (13), dog (23), hen (5), <i>Bos primigenius</i> (4), red deer (11), fallow deer (21), wild pig (7), wolf (1), rodent (1), wild bird (3), turtle ( <i>Chelonia</i> sp.) (4)	Bökönyi, 1990; 1993
Roselle	6	settlement	194	42	26	32	horse (4), dog (11), red deer (7)	Corradi, 1989
San Giovenale	2 (+3&1)	cult	36	28	56	17	horse (1), red deer (2)	Sorrentino, 1981
Vaste, Fondo Sant'Antonio	mid 3	settlement	147	97	1	1	<i>Testudo</i> sp. (64)	Albarella, 1995
Vaste, Fondo Sant'Antonio	2	settlement	45	71	22	7	horse (13), dog (1), red deer (1), ungulate (1), <i>Testudo</i> (1), bird (1)	Albarella, 1995

TABLE 9. Rodent and non-mammalian bone from possible ritual deposits.

<i>Taxa</i> ↓	<i>Context</i> →	<i>Feature 231</i>	<i>Feature 232</i>	<i>Feature 206</i>		<i>Total</i>
		209	218	197	199	
House mouse		1	5	1	2	9
Wood/yellow-necked mouse		1	1	-	3	5
Mouse		-	2	3	9	14
Small rodent		2	15	11	41	69
Large rodent		1	1	-	-	2
cf. domestic fowl		-	-	-	2	2
Bird (not further identified)		2	1	2	2	7
Snake		-	2	-	3	5
Lizard		-	1	-	3	4
Frog/Toad		-	2	-	-	2
Sea Urchin		-	1	-	-	1
<b>Total</b>		<b>7</b>	<b>31</b>	<b>17</b>	<b>65</b>	<b>120</b>

TABLE 10. Rodent and non-mammalian bone from non-ritual contexts.

<i>Taxa</i>	<i>Context group 101</i>	<i>Context groups 0-9</i>	<i>Total</i>
House mouse	2	3	5
Wood/yellow-necked mouse	-	1	1
Mouse	1	1	2
Small rodent	2	15	17
Large rodent	1	-	1
Thrush-sized passerine	-	1	1
Bird (not further identified)	1	-	1
Lizard	3	2	5
Frog	-	1	1
Frog/Toad	-	1	1
<b>Total</b>	<b>10</b>	<b>25</b>	<b>35</b>

TABLE 11. Hand-retrieved rodent and non-mammalian bone.

<i>Taxa</i>	<i>Context groups 0-9</i>	<i>Context groups 10-14</i>	<i>Total</i>
Small rodent	-	8	8
Domestic fowl	-	1	1
cf. domestic fowl	1	9	10
Bird (not further identified)	-	2	2
Tortoise	1	1	2
Unidentified	-	1	1
<b>Total</b>	<b>2</b>	<b>22</b>	<b>24</b>

TABLE 12. Measurements of domestic fowl bones.

<b>Bone</b>	<b>Fusion</b>	<b>1.</b>	<b>2.</b>	<b>3.</b>	<b>4.</b>	<b>Context group</b>	<b>Context</b>
coracoid		50.6	48.4	14.7	11.8	2	I9.12.2 *198
carpometacarpus		38.8	36.1	11.4	7.1	13	I9.12.2 *236
tibiotarsus	DF	17.1				14	I9.12.2 *302

**KEY:** All measurements are given in millimetres. The recommendations of von den Driesch (1976) have been followed whenever possible and the relevant abbreviations are indicated below.

coracoid	1.	greatest length (GL)
	2.	medial length (Lm)
	3.	basal breadth (Bb)
	4.	breadth of the basal articular surface (BF)
carpometacarpus	1.	greatest length
	2.	length of metacarpus II (L)
	3.	breadth of the proximal end (Bp)
	4.	diagonal length of the distal end (Did)
tibiotarsus	1.	depth of the distal end (Dd)

TABLE 13. Fish bones.  
Key: v – vertebra; sk – skull fragment; ot – otolith.

	Context group 101			Context groups 0-9													Context groups 10-14				
	678	679	Total	209	218	247	258	284	304	328	330	331	394	Total	197	199	236	Total			
Eel	1v	-	1	-	1v	1v	1v	-	-	-	-	-	-	3	-	-	-	0			
Sardine	-	-	0	-	-	-	-	1v	-	-	-	-	-	1	-	-	-	0			
Hake	-	-	0	1v	2v	-	-	-	-	-	-	-	1v	4	-	-	-	0			
Gurnard	-	-	0	1sk	-	-	-	-	1v	-	-	-	-	2	-	-	-	0			
Sead	-	-	0	-	-	-	-	-	-	-	-	-	-	0	1v	-	-	1			
Sea bream	1v	1v	2	2v	3v	-	-	-	-	1v	-	-	-	6	-	2v	-	2			
Pandora	-	-	0	-	-	-	-	-	-	-	1v	-	-	1	-	-	-	0			
Meagre indet.	-	-	0	1v	-	-	-	-	1v	-	-	-	-	2	-	1ot	-	1			
?Red mullet	-	-	0	1v	-	-	-	-	-	-	-	-	-	1	-	-	-	0			
Mullet indet.	-	-	0	1v	3v	-	-	-	-	-	-	-	-	4	1v	-	-	1			
Corkwing wrasse	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-	1sk	-	1			
Wrasse indet.	-	-	0	-	-	1v	1sk	-	-	-	-	-	-	2	-	-	-	0			
c.f. Tunny indet.	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-	-	2v	2			
Scombrid	-	-	0	-	10v	-	-	-	-	-	-	-	-	10	-	-	-	0			
Flatfish	-	-	0	-	-	1sk	-	-	-	-	-	-	-	1	-	-	-	0			
Indet. vertebra	-	-	0	-	1v	-	-	-	-	1v	-	-	-	2	-	-	-	0			
<b>TOTAL</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>7</b>	<b>20</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>39</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>8</b>			

TABLE 14. Carbonized plant remains from context groups 2-9.

House and room	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	
<i>Context group</i>	2	5	5	5	5	5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
<i>Context</i>	381	330	333	329	328	331	218	218	218	218	218	218	218	218	218	218	218	218	218	218	218	218	218
<i>Sample</i>	22*	19*	17*	16*	15*	14*	558*	562	566	556	557	580	586	590	585	588	3*, 8*	304	284	591			
<i>Sample volume (litres)</i>	5.5	6.0	5.0	6.0	6.0	5.5	39	10	10	10	1.9	5	10	9	7	10	20	10					
<i>No. of items / litre</i>	11.1	4.5	6.8	0.3	0.7	4.4	1.8	0.8	6.5	30.1	67.4	1.8	0.5	0.4	2.1	2.9	15.2	3.3					
CEREAL GRAIN																							
<i>Triticum cf. monococcum</i> L.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>T. dicoccum</i> Schübl.	-	-	-	-	-	-	1	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
<i>T. cf. dicoccum</i> Schübl.	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Triticum</i> sp.	-	-	-	-	-	-	-	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
- short free-threshing grain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Triticum</i> sp.	-	-	-	-	-	-	-	-	10	7	1	-	-	-	-	-	-	-	-	-	-	-	-
<i>Hordeum vulgare</i> L.	-	-	-	-	-	-	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
- hulled lateral grain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Hordeum</i> sp. - hulled median grain	-	-	-	-	-	-	1	1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-
<i>Hordeum</i> sp. - hulled	-	-	-	-	-	-	3	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Hordeum</i> sp. - median grain	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Hordeum</i> sp.	-	-	-	-	-	-	3	2	3	1	3	1	-	-	1	4	1	-	-	-	-	-	-
- large grain indet.	-	-	-	-	-	-	42	-	13	22	1	3	-	-	1	1	2	1	-	-	-	-	-
<i>Panicum miliaceum</i> L.	-	1	1	1	-	-	-	-	-	-	-	-	-	-	3	1	-	-	-	-	-	-	-
<i>Panicum / Setaria</i> sp.	-	-	-	-	-	-	1	2	-	-	-	-	-	-	4	2	-	-	-	-	-	-	-
- millets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total cereal grain	0	1	4	1	2	1	54	5	34	41	6	5	2	0	9	10	3	1					
CEREAL CHAFF																							
<i>Triticum dicoccum</i> Schübl.	-	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>T. cf. dicoccum</i> Schübl.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>T. monococcum</i> L. or <i>dicoccum</i> Schübl.	-	6	8	-	-	1	-	-	-	-	-	-	-	-	1	6	2	17					
<i>Hordeum</i> sp.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- barley rachis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total cereal chaff	0	8	8	0	0	2	2	0	0	0	0	0	0	0	1	8	3	19					



TABLE 14. Carbonized plant remains from context groups 2-9 — (cont.).

House and room	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2
<i>Context group</i>	2	5	5	5	5	7	7	7	7	7	7	7	7	7	7	7	7	7	7
<i>Context</i>	381	330	333	329	328	331	218	218	218	209	209	209	258	248	250	247	279	304	284
<i>Sample</i>	22*	19*	17*	16*	15*	14*	558*	562	566	556	557	580	586	590	585	588	3*, 8*	591	
<i>Sample volume (litres)</i>	5.5	6.0	5.0	6.0	6.0	5.5	39	10	10	10	1.9	5	10	9	7	10	20	10	
<i>No. of items / litre</i>	11.1	4.5	6.8	0.3	0.7	4.4	1.8	0.8	6.5	30.1	67.4	1.8	0.5	0.4	2.1	2.9	15.2	3.3	
<b>CULTIVATED LEGUMES</b>																			
<i>Cicer arietinum</i> L.	-	-	-	-	-	-	-	-	-	1	34	2	1	-	-	-	-	-	-
<i>Vicia faba</i> L.	-	-	-	-	1	-	-	-	3	1	-	-	-	-	1	-	-	-	-
cf. <i>V. faba</i> L.	-	-	-	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-	-
cf. <i>Lens culinaris</i> Medic.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
cf. <i>Cicer / Vicia / Pisum</i> sp.	-	-	1	-	1	-	1	-	5	-	-	-	1	-	-	1	1	1	-
Total legumes	0	0	1	0	2	0	2	1	9	36	2	2	0	0	1	1	1	1	1
<b>FRUIT AND NUTS</b>																			
<i>Juglans regia</i> L.	-	-	-	-	-	-	-	-	-	3	18	62	-	-	-	-	-	-	-
<i>Corylus avellana</i> L.	-	-	-	-	-	-	2	-	3	98	14	1	-	-	-	-	-	-	-
<i>Ficus carica</i> L.	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-
<i>Pyrus communis</i> L.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
<i>Ceratonia siliqua</i> L.	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-
<i>C. siliqua</i> L.	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-
<i>Vitis vinifera</i> L.	-	-	-	-	-	-	3	-	1	51	6	-	1	-	-	1	-	1	1
<i>V. vinifera</i> L.	-	-	-	-	-	-	-	-	-	12	3	-	-	-	-	-	-	-	-
<i>V. vinifera</i> L.	-	-	-	-	-	-	-	-	-	3	1	-	1	-	1	-	-	-	-
<i>Punica granatum</i> L.	-	-	-	-	-	-	-	-	-	31	17	-	-	-	-	-	-	-	-
<i>P. granatum</i> L.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Total fruit and nuts	0	0	0	0	0	0	5	1	22	214	103	2	1	1	1	0	1	1	1
<b>OTHER CROPS AND GARDEN PLANTS</b>																			
<i>Papaver somniferum</i> L.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Total other crops and garden plants	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

TABLE 14. Carbonized plant remains from context groups 2-9 — (cont.).

House and room	12.2																	
	2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Context group	381	330	333	329	328	331	218	218	218	209	209	258	248	250	247	279	304	
Context	22	19*	17*	16*	15*	14*	558	562	566	556	557	580	586	590	585	588	3, 8*	
Sample	5.5	6.0	5.0	6.0	6.0	5.5	39	10	10	10	1.9	5	10	9	7	10	20	
Sample volume (litres)	11.1	4.5	6.8	0.3	0.7	4.4	1.8	0.8	6.5	30.1	67.4	1.8	0.5	0.4	2.1	2.9	15.2	
No. of items / litre	61	18	21	1	0	21	7	0	0	10	17	0	2	3	3	10	295	
WEEDS AND OTHERS																		
<i>Polygonum aviculare</i> agg.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Rumex acetosella</i> agg.	-	2	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	
<i>Rumex</i> sp. (not <i>acetosella</i> )	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	1	1	
dock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
nettle-leaved goosefoot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	
<i>Chenopodium murale</i> L.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Chenopodium</i> sp.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	
<i>Stellaria media</i> gp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
chickweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	
<i>Cerastium</i> sp.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	
mouse-ear chickweed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Silene gallica</i> L.	15	5	5	-	-	3	1	-	-	-	6	-	-	-	-	76	2	
small-flowered catchfly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Silene</i> sp.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	
catchfly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
capsule teeth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Ranunculus</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Buttercup	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Brassicaceae indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
vetch or tare	3	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	2	
<i>Vicia</i> or <i>Lathyrus</i> sp.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
medick	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
cf. <i>Medicago</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Trifolium</i> sp.	29	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
clover	1	-	1	-	-	8	1	-	-	-	-	1	-	-	1	158	3	
<i>Ornithopus</i> sp.	-	-	3	-	-	3	1	-	-	-	-	-	-	-	-	-	-	
bird's foot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pod segment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Leguminosae indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Euphorbia helioscopia</i> L.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
sun spurge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
mallow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Viola</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Viola</i> S. <i>Melanium</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pansy	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	
<i>Anagallis</i> sp.	1	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	
pimpernel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
field madder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Sherardia arvensis</i> L.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
goosegrass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Gallium aparine</i> L.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
bedstraw etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Gallium</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
corn gromwell	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	
<i>Lithospermum arvense</i> L.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
corn chamomile	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	3	
<i>Anthemis arvensis</i> L.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	
rye-brome	1	1	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	
<i>Bromus</i> cf. <i>secalinus</i> L.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Gramineae indet.	9	3	2	1	-	2	-	-	-	1	4	-	-	-	1	7	19	
grass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	
weed indet.	61	18	21	1	0	21	7	0	0	10	17	0	2	3	3	10	295	
Total weed seeds and others																	11	

TABLE 15. Carbonized plant remains from *context group* 101.

	<b>House and room</b>	<b>11.5B</b>
	<b>Context group</b>	<b>101</b>
	<b>Context</b>	<b>678</b>
	<b>Sample</b>	<b>32<sup>a</sup>, 2018, 2019, 2020, 2021</b>
	<b>Sample volume (litres)</b>	<b>50</b>
	<b>No. of items / litre</b>	<b>2.4</b>
<b>CEREAL GRAIN</b>		
<i>Hordeum</i> sp. - hulled	hulled barley	1
<i>Hordeum</i> sp.	barley	1
<i>Panicum miliaceum</i> L.	common millet	2
<i>Setaria</i> cf. <i>italica</i> (L.) Beauv.	foxtail millet	3
<i>Panicum</i> / <i>Setaria</i> sp.	millets	14
Total cereal grain		21
<b>CEREAL CHAFF</b>		
<i>Triticum</i> cf. <i>monococcum</i> L.	einkorn wheat glume	1
<i>T. dicoccum</i> Schübl.	emmer wheat glume	4
<i>T. monococcum</i> L. or <i>dicoccum</i> Schübl.	einkorn or emmer wheat glume	7
<i>Hordeum</i> sp.	barley rachis	1
Total cereal chaff		13
<b>CULTIVATED LEGUMES</b>		
<i>Vicia faba</i> L.	field bean	1
cf. <i>Cicer</i> / <i>Vicia</i> / <i>Pisum</i> sp.	peas, beans etc.	2
Total legumes		3
<b>FRUIT AND NUTS</b>		
<i>Vitis vinifera</i> L.	grape	5
<i>V. vinifera</i> L.	grape stalk	1
Total fruit and nuts		6
<b>WEEDS AND OTHERS</b>		
<i>Polygonum aviculare</i> agg.	knotgrass	1
<i>Rumex acetosella</i> agg.	sheep's sorrel	2
<i>Silene gallica</i> L.	small-flowered catchfly	11
<i>Raphanus raphanistrum</i> L.	wild radish pod segment	1
<i>Vicia</i> or <i>Lathyrus</i> sp.	vetch or tare	4
cf. <i>Medicago</i> sp.	medick	1
cf. <i>Trifolium</i> sp.	clover	6
<i>Ornithopus</i> sp.	bird's foot pod segment	12
Leguminosae indet.		6
<i>Sherardia arvensis</i> L.	field madder	1
<i>Sambucus nigra</i> L.	elder	1
<i>Anthemis arvensis</i> L.	corn chamomile	1
<i>Carex</i> sp.	sedge	1
<i>Bromus</i> cf. <i>secalinus</i> L.	rye-brome	2
Gramineae indet.	grasses	8
weed indet.		19
Total weed seeds and others		77

TABLE 16. Carbonized plant remains from *context groups* 10–12.

	<b>House and room</b>	<b>12.2</b>	<b>12.2</b>	<b>12.2</b>
	<b>Context group</b>	<b>10</b>	<b>11</b>	<b>12</b>
	<b>Context</b>	<b>266</b>	<b>119</b>	<b>199</b>
	<b>Sample</b>	<b>583</b>	<b>140</b>	<b>542, 543, 550, 554</b>
	<b>Sample volume (litres)</b>	<b>10</b>	<b>10</b>	<b>27</b>
	<b>No. of items / litre</b>	<b>1.6</b>	<b>2.8</b>	<b>1.1</b>
<b>CEREAL GRAIN</b>				
Large grain indet.	wheat, barley etc	1	-	1
<i>Panicum miliaceum</i> L.	common millet	1	2	-
<i>Panicum / Setaria</i> tp.	millets	1	10	5
Total cereal grain		3	12	6
<b>CEREAL CHAFF</b>				
<i>Triticum monococcum</i> L. or <i>dicoccum</i> Schübl.	einkorn or emmer wheat glume	-	1	-
<i>T. dicoccum</i> Schübl. or <i>spelta</i> L.	emmer or spelt wheat glume	1	-	-
Total cereal chaff		1	1	0
<b>CULTIVATED LEGUMES</b>				
<i>Lens culinaris</i> Medic.	lentil	-	-	1
cf. <i>Lens culinaris</i> Medic.	lentil	-	-	1
cf. <i>Cicer / Vicia / Pisum</i> sp.	peas, beans etc.	1	-	-
Total legumes		1	0	2
<b>FRUIT AND NUTS</b>				
<i>Juglans regia</i> L.	walnut	-	-	1
<i>Corylus avellana</i> L.	hazel nut shell frags	-	-	12(=1)
<i>Ficus carica</i> L.	fig	-	-	3
<i>Vitis vinifera</i> L.	grape	-	-	4
<i>Olea europaea</i> L.	olive	-	-	1
Total fruit and nuts		0	0	21
<b>WEEDS AND OTHERS</b>				
<i>Polygonum aviculare</i> agg.	knotgrass	-	1	-
<i>Rumex acetosella</i> agg.	sheep's sorrel	-	1	-
<i>Chenopodium murale</i> L.	nettle-leaved goosefoot	1	-	-
cf. <i>Silene</i> sp.	catchfly capsule tooth	1	-	-
Leguminosae indet.		-	1	-
<i>Euphorbia helioscopia</i> L.	sun spurge	1	-	-
<i>Lithospermum arvense</i> L.	corn gromwell	-	1	-
weed indet.		8	11	2
Total weed seeds and others		11	15	2

TABLE 17. Calcium phosphate mineralized plant remains.

	<b>House and room</b>	<b>11.5B</b>	<b>12.2</b>	<b>12.2</b>	<b>12.2</b>
	<i>Context group</i>	<b>101</b>	<b>7</b>	<b>10</b>	<b>12</b>
	<b>Context</b>	<b>678</b>	<b>218</b>	<b>266</b>	<b>199</b>
	<b>Sample</b>	<b>32<sup>*</sup>, 2018, 2019, 2020, 2021</b>	<b>562</b>	<b>583</b>	<b>542, 543, 550, 554</b>
	<b>Sample volume (litres)</b>	<b>50</b>	<b>10</b>	<b>10</b>	<b>27</b>
	<b>No. of items / litre</b>	<b>1.0</b>	<b>0.8</b>	<b>0.7</b>	<b>0.1</b>
<b>FRUIT AND NUTS</b>					
<i>Ficus carica</i> L.	fig	45	-	7	2
<b>Total fruit and nuts</b>		<b>45</b>	<b>0</b>	<b>7</b>	<b>2</b>
<b>OTHER CROPS AND GARDEN PLANTS</b>					
<i>Papver somniferum</i> L.	opium poppy	-	8	-	-
<b>Total other crops and garden plants</b>		<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>
<b>WEEDS AND OTHERS</b>					
<i>Chenopodium</i> sp.	goosefoots etc.	1	-	-	-
<i>Silene gallica</i> L.	small-flowered catchfly	1	-	-	-
weed indet.		3	-	-	-
<b>Total weed seeds and others</b>		<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>

TABLE 18. Marine shells from the pre-Roman phases under house 12.2.

	<i>Context group</i>	<b>Minimum Number of Individuals</b>											
		<b>5</b>				<b>7</b>	<b>10</b>	<b>12</b>		<b>14</b>			
		<b>271</b>	<b>301</b>	<b>315</b>	<b>330</b>	<b>218</b>	<b>266</b>	<b>190</b>	<b>199</b>	<b>85</b>	<b>305</b>	<b>306</b>	
<b>Sample</b>					<b>560</b>	<b>583</b>		<b>550</b>					
<b>MOLLUSCA</b>													
<i>Patella</i> sp.	limpet	-	-	-	-	-	1	-	-	-	-	-	-
cf. <i>Murex</i> sp.		-	-	-	-	-	-	1	-	-	-	-	-
<i>Cerastoderma edule</i> (L.) or <i>glaucum</i> (Brug.)	cockle	1	-	-	1	-	-	-	-	-	-	-	-
<i>Cerastoderma</i> cf. <i>edule</i> (L.) or <i>glaucum</i> (Brug.)	cockle	-	-	1	1	-	-	-	-	-	-	-	-
<i>Venerupis decussata</i> (L.)	vongole, a carpet shell	-	-	-	-	-	-	-	-	-	-	-	1
<i>Donax trunculus</i> L.	<i>tellini</i>	-	1	-	-	-	-	2	-	1	2	4	
<i>Donax</i> cf. <i>trunculus</i> L.	<i>tellini</i>	-	-	-	-	-	-	-	1	-	1	1	
<b>ECHINODERMATA</b>													
	sea urchin	-	-	-	-	1	-	-	-	-	-	-	-