

CHAPTER 1

REPORT ON THE 1987 EXCAVATIONS THE EXCAVATION OF HOUSE P46.33

Site supervisor: Ann Bomann

1.1 Introduction

Previous excavators at Amarna met the challenge of the scale of the site by clearing large areas to expose the outlines of whole neighbourhoods of houses. From the size of exposures achieved and from the surface character of the still unexcavated areas we can judge that we already have a picture of the residential parts of the city that is likely to remain generally valid. A continuation of the old policy of area-stripping, quite apart from requiring an unobtainable level of resources, is not necessary. Yet the old reports leave a host of questions unanswered, or hint at the existence of features which need to be clarified by further study. Furthermore, the old pattern of excavation and recording was itself selective, but not as would be produced by following a strategy of strictly representative sampling. This is most obvious with the pottery, where it is all too clear that the lists of types obtained in the past are so tiny a fraction of the total pottery present in the ground as to be seriously unrepresentative. More subtly, the very record of what lay in the ground is itself subject to a major distortion that is not always fully apparent from the published reports. Excavation was targeted primarily towards house mounds. Where houses lay close together excavation was thorough, but where open spaces intervened — as streets, open spaces, or the compounds of large estates — it was very selective or even quite limited. The appearance of the modern surface often reveals how, when the density of wall clusters declined, individual walls were followed by trenching along the sides, leaving adjacent “open” ground undug except by an occasional narrow scoring by a *tourieh* in the search for additional features. Thus the greater part of most “gardens” and other spaces within house compounds remains largely untouched.

The purpose of renewed fieldwork within the Main City is thus reasonably clear. It is to achieve a much more detailed record of areas chosen to be representative of the site's various aspects, the increase in detail being not only quantitative, but also subject to greater precision as to where the material has come from. With these considerations in mind a suitable area for study was selected.

The research area chosen crosses the city from east to west at one of its widest points, between the Central City and the broad wadi which cuts the Main City into two separate parts. On the east it is bounded by the old German and British excavations, and on the west by the modern cultivation. Its width is thus about 500 metres, and its breadth about 300, although the north and south boundaries have not yet been precisely defined. Over this tract the surface of the ground varies, creating a progression of zones which, from east to west, seem to denote: unexcavated houses where modern disturbance is slight; unexcavated houses where modern disturbance is severe; a non-house area marked by large open enclosures which runs along the east side of the modern road; large brick buildings between the modern road and the cultivation which are probably also not houses. All except the first zone has seen extensive turning-over in modern times, although, as has been pointed out before (*AR* II: 58–63; *AS*: 17–18), most of this was done in the first half of the 19th century. This was a turning over of the ground in the search for treasure and for antiquities; the element of *sebakh*-digging, which results in much of the ancient soil and brickwork being transported away from the site altogether, was probably limited, although towards the cultivation the loss of standing brickwork and of rubble has been considerable. Insofar as one can tell, at least to the east of the modern road there has not been a significant loss of volume, only a general stirring of the soil. These were the conditions which prevailed at much of the Central City before the excavations of Petrie and Pendlebury. The value of their results is a reassurance that work over our chosen research strip is likely to be worthwhile.

The planned scheme of research had three elements: detailed surface mapping, excavation of selected targets, and a surface sherd survey in continuation of that started in 1986. The first element is briefly described in the next section, whilst the remainder of the chapter is taken up

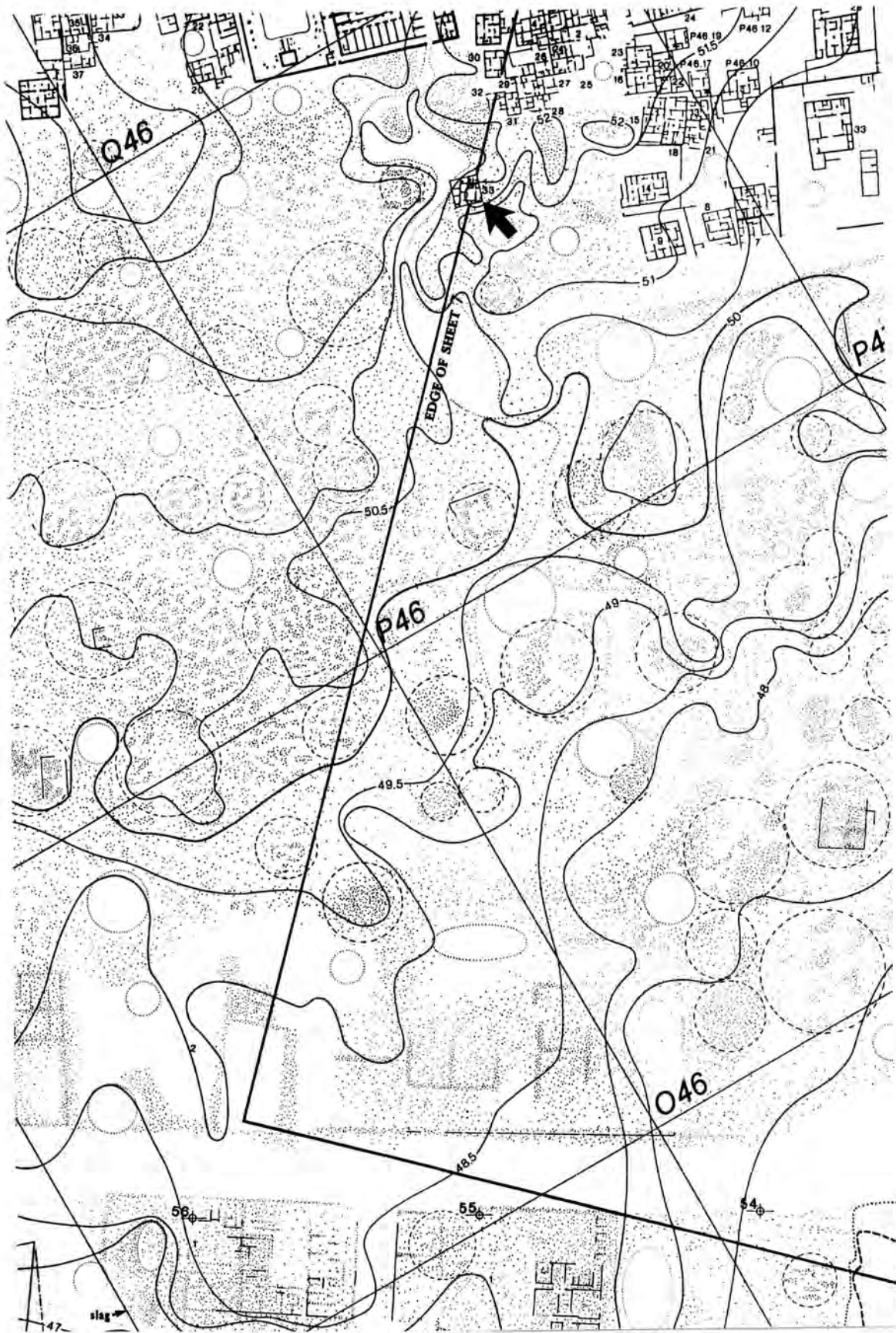


Figure 1.1a. The research strip as planned by the Amama Survey (scale 1:2000).

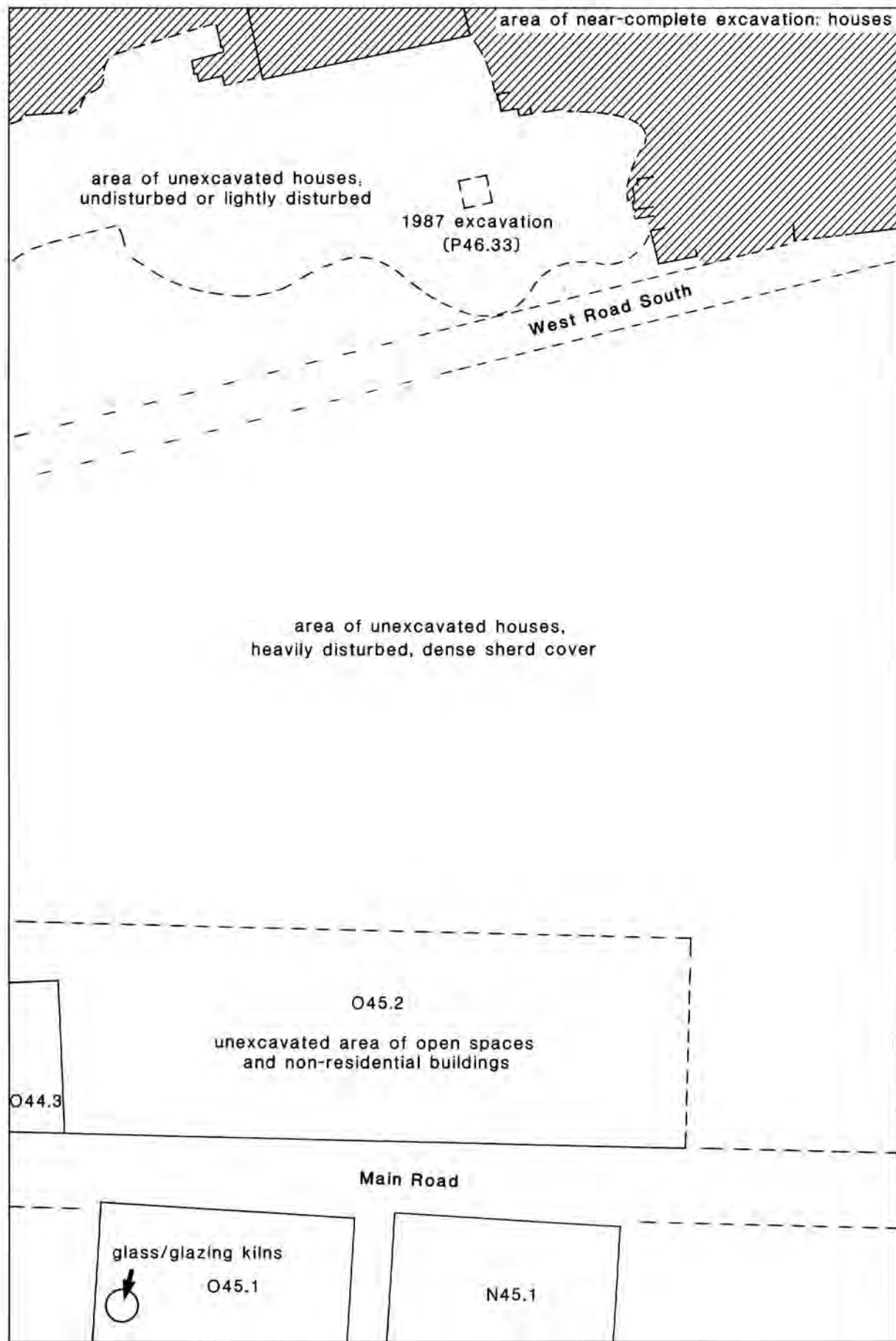


Figure 1.1b. Interpretation of the research strip.

with the report on the first sample excavation, as are the following three chapters. The first stage of the sherd survey across this area was included in the report on the sherd survey for 1987 published in *AR V*: Chapter 5; the results of its continuation, however, must await a future report. Whilst the work at Kom el-Nana has to take precedence over excavation within the research strip, it has proved possible to initiate a further small investigation at the west end. This is the site of the glazing kilns in O45.1, which forms part of the subject matter of the report on magnetometer surveying in Chapter 6.

1.2 Surface study of the research strip

The whole area has already been mapped at a scale of 1:1000, with contours at half-metre intervals, by Salvatore Garfi as part of the Amarna Survey (*AS*: Map Sheets 6 and 7; *AR I*: 93-95 and Figure 7.2, which includes the southern edge of the current research area, although not the part intensively studied this season). The relevant part has been reproduced here, Figure 1.1a. However, our intention to focus more intensely on this strip of ground requires that a larger-scale mapping be undertaken which allows finer detail to be shown. The chosen scale for this is 1:200, with contours at 25 cm. intervals. Mapping at this scale necessitates a great many closely-set survey points but also leads to the concentration of attention on the ground in a more methodical and critical manner than would otherwise be the case. So far a limited sector has been covered, which represents the eastern end of the strip where the first sample excavation has been carried out, Figure 1.2 (already published in *AR V*: 104, Figure 5.2).

In the unexcavated residential parts of Amarna the largest houses can be easily picked out as separate mounds taller than the surrounding ground, and some of the largest wells can be recognised by equally conspicuous circular depressions. For the most part, however, the ground undulates rapidly and irregularly in a manner which is at first extremely confusing to the eye (Figures 1.3, 1.4). The effect is made worse where digging was done in the 19th century AD. This can produce a chaotic landscape.

The area of more intensive mapping (Figure 1.2) has not suffered as badly as many. This is because it lies towards the furthest limit away from the modern cultivation. The most conspicuous local feature is the large house excavated by the DOG in 1914, Q46.1, the so-called "Weihnachtshaus" (Borchardt and Ricke 1980: 23-7, Plan 2). The line of its western enclosure wall is still clearly visible and served as a convenient base line for the mapping, and for laying out the excavation grid, Grid no. 2. The co-ordinates for this grid are marked on the map. The originating point for the grid is a wall junction in the small building at the south-west corner of the compound surrounding Q46.1. The reason for choosing this rather than the actual corner of the compound itself is that the latter is deeply buried by an excavator's dump which probably derives from the Society's own excavations in 1923 (see below). In order to expose the wall junction that we used the tail of the dump had to be removed, instantly bringing to light a cache of pottery within a deposit of sand which lay on the floor of the little building in the south-west corner of Q46.1. The cache has an interesting repertoire of forms which now awaits study. This little discovery was a timely reminder that any "cleaning" of the site, even of apparently excavated areas, can produce fresh archaeological material and should not be undertaken lightly.

The "archaeological" topography of the area mapped has been affected by a minor rainwater runoff channel which winds its way from the south-west corner of Q46.1 and has then both laid down a shallow lakebed-like deposit around the area of sherd-circle 30 and, as it continues curving generally westwards, cut a little channel between archaeological deposits. This little watercourse came to form the northern limit of the intensive mapping.

Around the south-eastern part of the area lies a group of houses excavated by the Society in 1922 (P46.14-16, 23) and 1923 (P46.24-32), the former published briefly in *COA I*: 32-34, the latter still awaiting publication (for the adjacent houses P46.1, 2, 4, 5, see Borchardt and Ricke 1980: 17-22, Plan 1). All appear to be part of a neighbourhood of small to medium-size houses built in a fairly dense spread around three sides of the large estate Q46.1 and its smaller neighbour Q46.2, and probably extending westwards to West Road South. Access to the neighbourhood was by narrow alleys from East Road South and perhaps also from West Road South, although we have no visible signs of this. Many of the houses are aligned to the two large estates, but a few (e.g. P46.5 and .30) lie at an angle of some ten degrees towards the north-

House P46.33: the excavation



Figure 1.2. Eastern end of the research strip freshly mapped in 1987 in more detail. The reference marks for Grid no. 2 are included, as are the sherd-survey circles 26–30. Contours are at quarter-metre intervals.

north-east. Our house P46.33 follows this latter alignment. More specifically, the detailed contour map implies that, beneath the unexcavated ground around P46.33, lies a continuation of housing of not dissimilar size. It seems to run westwards from P46.28, 31, 32, and north-westwards towards the site of P46.33, mainly within the area of the 51.50 m contour line. The edge of another group occurs on the western edge of the map, but now, from the general slope downwards of the ground, within the 51.00 m contour. The edge of West Road South should pass about 40 m to the west of P46.33, for its line is clear both to the north and to the south of the



Figure 1.3. View southwards of the area around P46.33 before excavation. The ranging rod stands on the crest of the mound beneath which house P46.33 lies. The prominent building beyond it is house P46.14.

area. Where its line passes through the survey area, however, there is nothing to give away its existence, either at ground level or from the air. Perhaps its course had become encumbered with rubbish deposits.

The desert surface in this region undulates smoothly showing a grey gravel cover on which lie very few sherds (e.g. sherd circle 26, AR V: 105), except in a few places where robber pits have been dug, their outlines usually fairly sharp. Amongst these likely housing areas lie two other kinds of surface configuration. One of these comprises the depressions floored with buff-coloured silt. It is likely that they are wells, and have been marked as such. The other comprises irregular swellings of the ground where the surface cover has a denser concentration of pebbles and, where undisturbed, many very small sherds. In most places, however, these deposits have been dug over in modern times revealing the presence beneath the surface of numerous sherds (e.g. sherd circles 27–30, AR V: 105) and patches or lenses of darker earth but no walls. It is very likely that these are the weathered remains of ancient rubbish dumps which must have occupied open spaces amongst the houses. When we consider their age and the likely loss of material from compaction and erosion we should conclude that originally they must have been quite substantial heaps. The rubbish heap represented by sherd-circles 28 and 29 (to which that represented by no. 30 perhaps originally belonged as well) ran along the rear wall of the compound surrounding the very large house Q46.1. A rear doorway in this wall gave access to the open ground from within the compound, and it is very tempting to see the large rubbish dump as originating, at least in part, from within the compound, thus from the activities in and around house Q46.1. Similarly the other rubbish dumps must be composed in part of material discarded from some of the smaller houses in the vicinity. This has an important lesson for the archaeological study of the housing areas at Amarna. For a more complete picture one must add together the material from outside as well as from inside individual houses.

Further west, beyond the limits of the intensive mapping of 1987, the surface of the site continues to undulate rapidly, but with increasing signs of turning over of deposits (cf. Figure



Figure 1.4. Aerial photograph taken in April 1993 of the area around house P46.33, which is situated towards the bottom left corner. The direction is approximately southwards.

1.4). At roughly eighty metres before the line of Main Road (now followed by the modern road) is reached, however, the surface flattens out and the shallow pitting becomes patchy. It is evident that the dug-over house mounds have been replaced by something with a different character, probably possessing large open areas and perhaps buildings with thin walls (provisionally numbered O45.2). To the south it gives way to an extension of the housing zone westwards to the line of the road, while to the north, opposite the site of the modern water tower, the equivalent strip of ground is occupied by a substantial building with many exposed walls which looks as though it is a magazine block (O44.3). All that one can currently say of this strip is that it is not a residential area but is likely to belong to a broad group of buildings and enclosures at Amama which seem to be connected to the storage, movement, or manufacture of commodities.

Across the road lies a dense complex of brick walls which rise clear of the debris and form what seems to be the rear of two large rectangular enclosures which extend westwards towards the river (Figures 1.1a and b). By some fifty metres back from the road the walls rapidly dwindle in height as they approach the area beside the modern cultivation, which has long been exposed to use by farmers and has become very denuded. These two buildings are provisionally labelled O45.1 and N45.1. The outlines of the walls were planned by Wilkinson and Erbkam (for Lepsius), showing that they had been exposed by treasure-seekers in the early nineteenth century. In our present state of knowledge they, too, are probably best seen as compounds given over to the handling of commodities. Within the northern one, O45.1, is located the likely area of glazing kilns which formed the subject of a magnetometer survey in 1992 (Chapter 6).

1.3 House P46.33: progress of the excavation

On the afternoon of February 22nd, 1987, a block of four five-metre squares was laid out over the north part of a conspicuous medium-sized house mound the surface of which was still, for the most part, smooth and undisturbed. Previous to this the area had been contour-planned, and a sherd-circle (no. 26) had been described over the crest. Within this circle thirty-two badly weathered sherds were collected, too few to provide a useful ceramic profile (*AR V*: 105). The four squares were aligned to the co-ordinates of grid no. 2, and had the designations K15, L15, K16, L16. The only sign of modern disturbance was the outline of a shallow sand-filled pit running along the line dividing squares K15 and K16. Subsequent excavation showed that this had inflicted no detectable damage on the structures beneath.

Excavation began on the following day, using one team of local excavators (two trowel men, one siever, and four basket carriers). Except for periods when digging was suspended altogether to allow time for the completion of plans, this team worked until all four squares had been excavated down to the ancient floor or ground levels. Their last day of work was April 2nd, thirty-four working days from the beginning. For the first nine days the excavation was supervised by B. Kemp; thereafter all supervision and recording was done by Ann Bomann. The matter of dumping spoil was given some thought. It was planned that this was to be but the first of a series of seasons of excavation in this area, and it was also hoped to develop a programme of mud-brick conservation so that the wall outlines of excavated buildings could be left exposed. It thus seemed necessary to ensure that the spoil was not left behind to encumber future areas of investigation and to disfigure the site generally. Whilst the excavation was in progress the spoil was heaped in the shallow depression to the north-east of the excavation site but, at the end, it was removed by tractor and trailer and dumped in the open desert, on the wadi floor not far from the spoil heaps from the excavation of building Q48.4.

The excavation began with the removal of the surface of pebbly sand [3030] over square K16, to a depth of 10 cm. This revealed the tops of mud-brick walls separated by patches of sand and decayed brick rubble. Whilst this was being planned the similar surface material over square L15 was removed, as unit [3031] (Figure 1.18). Rubble and wall tops lay just beneath the surface over the western part but, to the east, despite a steep downwards slope, construction debris dipped out of sight beneath sand. Thenceforth the excavation was alternated between these two diagonally-lying squares until the floors in most of the rooms had been reached. The exceptions were areas 16-18 which seemed to belong to an adjacent building, and where the floor deposits were left sealed (for a future season) beneath a layer of collapsed brickwork, and the central room of the house (area 3) where, to aid the drawing of a continuous section across the site (Figure 1.17), the fill was left in place until the removal of its continuation in square K15 to the south. On March 14th and 15th work began successively on the removal of the surface deposits over squares K15 and L16, respectively units [3301] and [3320].

By the end of the season the floors in all of the rooms and spaces over this block of four five-metre squares had been exposed (with the exception of those in areas 16-18, as just noted). Although it was evident that further layers of rubbish lay beneath the floor in the north-east corner of area 15, time did not permit further and deeper excavation here. During the season 1:25-scale plans were made of each of the four squares at the early stage showing rubble fill and wall tops once the surface sand had been removed (combined as Figures 1.21, 1.22), and again at the final stage once the floors had been exposed (Figure 1.5); intermediate-stage plans were also made where necessary. A single east-west section at 1:25 scale was drawn (Figure 1.17), and sufficient spot-heights were taken so that, in conjunction with the photographic record, perspective drawings of the building could be prepared (Figure 4.8).

1.4 Wall pattern and room description

During the excavation each separate deposit and feature was assigned its own unit number in the running series maintained for all excavation at Amama. In the subsequent writing of this report, however, a more convenient set of numbers was assigned to the rooms and areas. These are all notionally subdivisions of house P46.33. However, we cannot really be certain that the spaces on the east and north belonged originally to this house rather than to another adjacent house (or houses). Excavation of the adjacent ground might clarify this, but even the past

House P46.33: the excavation

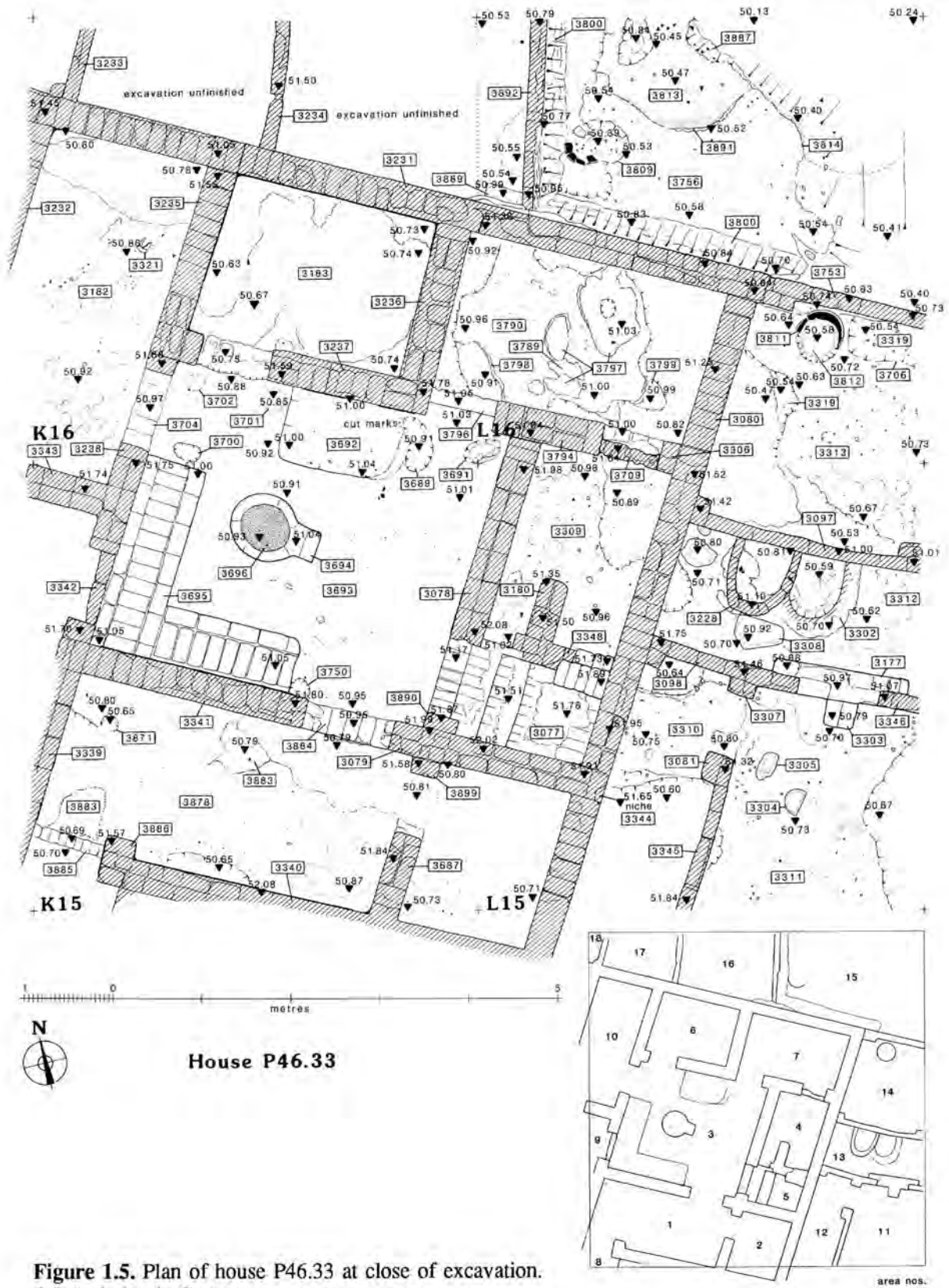


Figure 1.5. Plan of house P46.33 at close of excavation. Originals by A. Bomann.

1987 excavation

excavations of large areas of small houses have not always resolved the precise ownership of all enclosed spaces, which could, of course, have been held or used communally. A degree of arbitrariness seems unavoidable. The area numbers are given in an inset to Figure 1.5.

Most of the excavated area covers the remains of a single house of standard Amarna design, comprising a central room (**area 3**), surrounded on all four sides by smaller rooms (Figures 1.5, 1.6). Of these, a small part of **area 10** fell outside the limits of excavation, as did the major part of **area 9**. The result is that much of the western side of the house has not yet been investigated. In the following notes the room dimensions are between the mid-points of the walls. For clarity of presentation a separate plan (Figure 1.7a) is provided of what survived of the ancient floors.



Figure 1.6. House P46.33 viewed to the south-east at the close of excavations.

Area 1 represents the Front Hall. From roofing fragments found close to the floor in a rubble deposit [3703] we can judge that this was a roofed room and not an open court. Its dimensions are 3.89 x 1.86 m. The entrance from outside lay at the west end of the south wall [3340], and was by means of a doorway 83 cm wide, across a brick threshold [3885]. On the east side the doorway had been strengthened by an internal buttress [3886]; the west side of the doorway was simply the flat face of the wall [3339]. No trace was visible of an inserted door frame. Collapse of the excavation edge subsequently revealed the beginning of a wall (or possibly buttress) projecting south from wall [3340], 26 cm east of the doorway. This, and the simple form of the doorway itself, raises the likelihood that a small porch lay in front of the doorway, and would form **area 8**. The lifting of the last rubble layer revealed an uneven and seemingly patched floor [3878] of packed mud, beneath which were patches of an earlier mud floor [3883]. In the north-east corner, in front of the door into the central room, all traces of floor had gone, a circumstance which extended into the adjacent **area 2**. The only recognisable feature in the floor was a steep-sided circular hole [3871], c. 20 cm in diameter and 17 deep, cut through the floor in the north-west corner into the underlying sand [3099], presumably the emplacement for a large pottery jar. The walls had originally been plastered with mud (no traces of whitewash survived), of which a large area survived over the lower part of the south wall [3340], and smaller patches on the west wall [3339], and on the west face of the door jamb [3886].

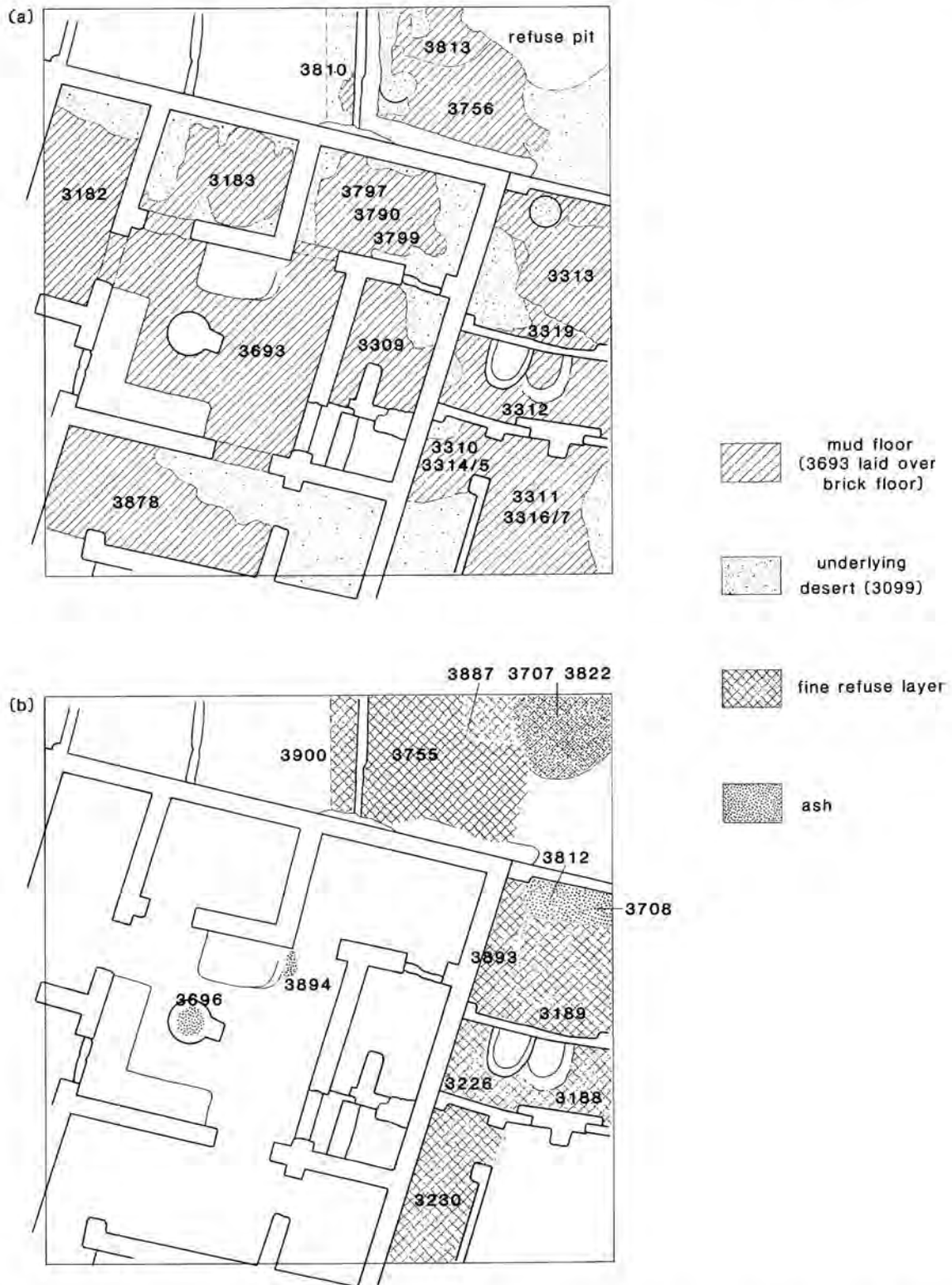


Figure 1.7. Simplified plans of the floors (a) and of the occupation debris (b) which lay over them.

1987 excavation

A doorway, 72 cm wide, in the east wall [3687] led to a small and nearly square (c. 1.45 x 1.84m) chamber, **area 2**. The removal of the last layer of rubble [3705], although done with care, exposed the underlying desert material [3099] without trace of a separate floor. Yet the bottom course of bricks showed fresh unweathered faces quite unlike those lying above, a sign that they had originally been protected presumably by a floor of some kind. Unless the floor had been dug up in the years following the abandonment of Amarna (always a possibility), before much rubble had accumulated and so whilst the walls were standing to a greater height, one can only assume that exposure to weathering (once the ceiling collapsed) so loosened the mud floor that it became a deposit indistinguishable from the overlying rubble. The brickwork at the bottom of wall [3687], where it formed the edge of the door, ran out for a short distance as if forming the beginning of a threshold, but then petered out. No plaster survived on the walls.

Area 3, measuring 3.35 (NS) x 3.83 (EW) m, served as the Central Room for the house (Figures 1.6, 1.9). Patches of an original mud wall plaster (without traces of whitewash) remained on all four sides, and ran down behind both of the daises. It was entered from the outside via a doorway, 1 m wide, from **area 1**, across a brick threshold [3884]. Although the sides of the doorway were rounded from wear, the top surface of the brick threshold was relatively fresh, as if it had not been exposed to traffic, whilst at either end two circular pats of mortar had been pressed flat, and the bottom parts of the brick jambs had been cut back by c. 13 cm to a depth of c. 17 cm on the outer side of the wall (Figure 1.8a). These are signs which, when taken together, point to the original existence of a separate threshold with projecting tongues on the outer edge which had been laid down over mortar pads at either end. A slight ridge between the mortar pads on the east side could be interpreted to show that the threshold had consisted of two narrow wooden beams or planks, the outer slightly longer than the inner. It is logical to suppose that a built-in threshold supported a full doorframe for a closing door.

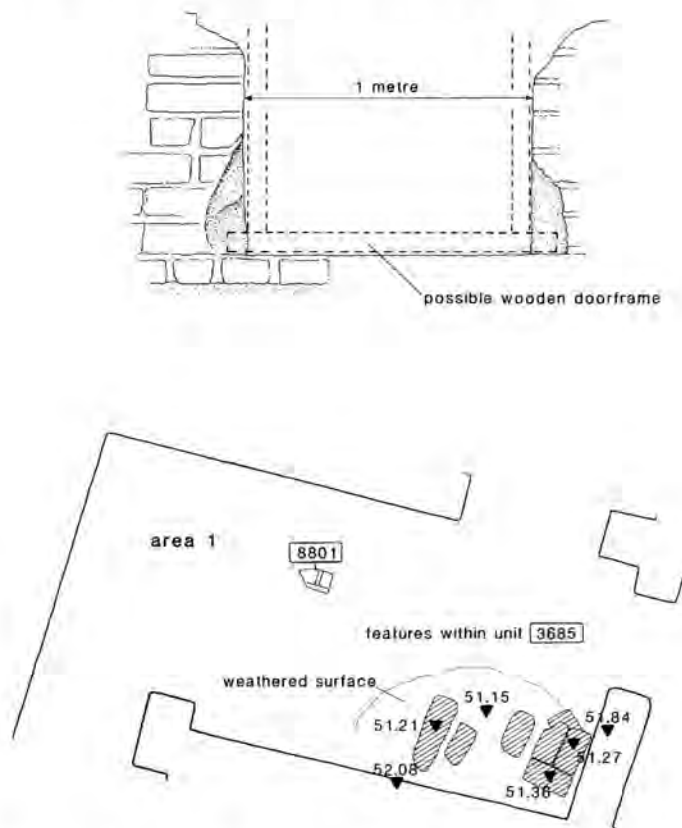


Figure 1.8. (a) southern elevation of the doorway between **areas 1** and **3**; (b) sketch plan of bricks in rubble unit [3685] in **area 1**.



Figure 1.9. View to the west of the dais and hearth in the Central Room, Area 3.

The floor of the Central Room had a hard-packed surface of mud [3693] into which small sherds and pieces of charcoal had been trampled. To judge from holes cut into it, it had a thickness of 10 cm, which should be interpreted as showing that the basis is a layer of bricks. The floor, which was basically undamaged, possessed several constructional features. Around the south and west sides stretched a low L-shaped dais [3695] of brick, one course high (8–11 cms), 70–75 cm deep on the west and c. 62 on the south (Figure 1.9). It had originally been coated with mud plaster. Its western side ran in front of a blocked doorway [3342]. This might suggest that a change of plan had taken place, although not particularly late in the building's short history. The reason for saying this reflects its position relative to the charcoal brazier [3694] that lay in front. This had been made by digging a hole into the floor, surrounding it with a low mud wall (50 cm dia; 10 cm high) and adding a seat on the east side made from a couple of bricks. A pottery hearth-bowl [3808] had been set inside the hole, but this had cracked over time and all that was left, deeply buried in ash [3696], was slightly more than half of the bottom. Hearths such as this have been found before in Amarna houses, although not as frequently as one might expect. When found they conform to a general rule that the seat is on the far side of the dais or, when the dais is L-shaped, on the far side of one part of it. The layout in house P46.33 conforms to this rule, and so implies that hearth and dais were laid out at the same time. At about 25 cm north-east of the hearth a small pottery bread tray was found in the rubble deposit which lay

actually on the floor [3349]. It could therefore have been left on the floor in this position. The way that doorway [3342] was blocked also left a niche in **area 9**, perhaps, therefore, creating deliberately one of the false doors which were a common feature in Amama houses.

A smaller dais [3692] lay against the middle of the north wall, 80–85 cm deep, 8–12 cm high, and at least 1.25 m wide. The edges had become worn and rounded to a much greater degree than was the case with the main dais, something especially visible on the eastern edge, which had been bevelled down to the level of the floor. The explanation for this, and for the general purpose of this secondary dais, is to be deduced from two kinds of evidence. The first is the presence of rounded depressions in the floor alongside the dais (see below) which were probably intended to steady one or more large pottery water-jars set upright. The second is that the dais occupies a position relative to the L-shaped dais which, in larger and better-appointed houses, was given over to a stone slab with raised border and sometimes stone backing set into the brick wall behind. This feature has generally been interpreted as a lustration-slab. A fine example was found in the house of the Vizier Nakht, its use described thus: “those who would wash went up by a single stone step on to the platform, which measured 2 metres by 1.33, and helped themselves to water out of a great jar which stood in a slight hollow cut in the centre of the paving” (*COA I*: 6, cf. Pl. V.4). What we probably have in our house, therefore, is a poorer person’s lustration-slab, made from mud-plastered mud brick and inevitably exposed to degradation from the effect of splashing water. In this modest house the presence of a simple lustration-place points to a strongly-felt need to maintain a social gesture of the richer segment of society. It could be argued that this was the original seating-dais which was replaced by the later construction of the L-shaped dais (which would, in turn, have necessitated moving the location of the hearth). Even if true, however, it remained an additional feature and still invites the interpretation of lustration-slab. It might also be noted that it was noticeably wider than the dais, at 81 cm as against 69–70 cm or less.

The distribution of the three main features — daises and hearth — in the confined space of this room must have had a powerful controlling effect on movement within the house. They left a clear path through from the Front Hall (**area 1**) to the larger room at the back (**area 7**); it was from this space, too, that the staircase also led. The remainder of the Central Room on the west was left as a more intimate zone for seating and socializing. Within it also lay access to three rooms which formed one side of the house, **areas 6, 9, and 10**. It is likely that, by comparison with other houses, one of them, **area 9**, was the main ground-floor bedroom, and thus, with its anteroom (**area 10**), one of the more private parts of the house.

A number of roundish depressions had formed in the mud floor, all of them around the rear, i.e. north wall, except for one [3750] beside the front door. This had a diameter of 23 cm, a depth of only 3 cm, and a slight extension out in one direction. Two depressions flanked the doorway to **area 7**. That on the west [3689] had an elliptical outline, dimensions of 50 x 34 cm, a depth of 15 cm, and an apparent lining of mud. A deposit of ash and organic material [3894] filled it. The depression on the east [3691] was also elliptical, measuring 43 x 23 cm, with a depth of 6 cm, and floored with mud. It had the dimensions and shape suited to holding a quern stone, but its location would have made it too awkward to use in this way. A corresponding pair of depressions also flanked the door to **area 6**. That closest to the dais [3701] was circular and shallowly concave, with a diameter of 28 cm and a depth of 4 cm; it had around its side a patch of what appeared to be sherd dust. The other [3702], diameter 22 cm, depth 2.5 cm, was identical in form and in having a patch of sherd dust in the side. This pair is particularly likely to have supported water-jars with broad rounded bases (group 16, cf. *AR I*: 135, 137). With a maximum diameter of perhaps 35 cm they would just stand snugly in these corner positions. The third depression [3700] was more irregular in outline and profile, 36 x 21 cm and 3–4 cm deep. It should be noted that the sherd record from **area 3** did not contain evidence for the presence of large jars of this kind. The vessels had presumably been removed whole by the original occupants of the house.

Areas 4 and 5 contained a staircase, to which access was gained from a doorway (1 m wide) at the southern end of the eastern wall of **area 3**. The north side of the door (the thickness of wall [3078]) bore a distinct vertical groove down the middle, ending at the bottom with a slightly deeper cut with rounded profile. There was no corresponding groove down the face of the opposite side [3890], but the bottom had been cut away slightly. These various indentations could

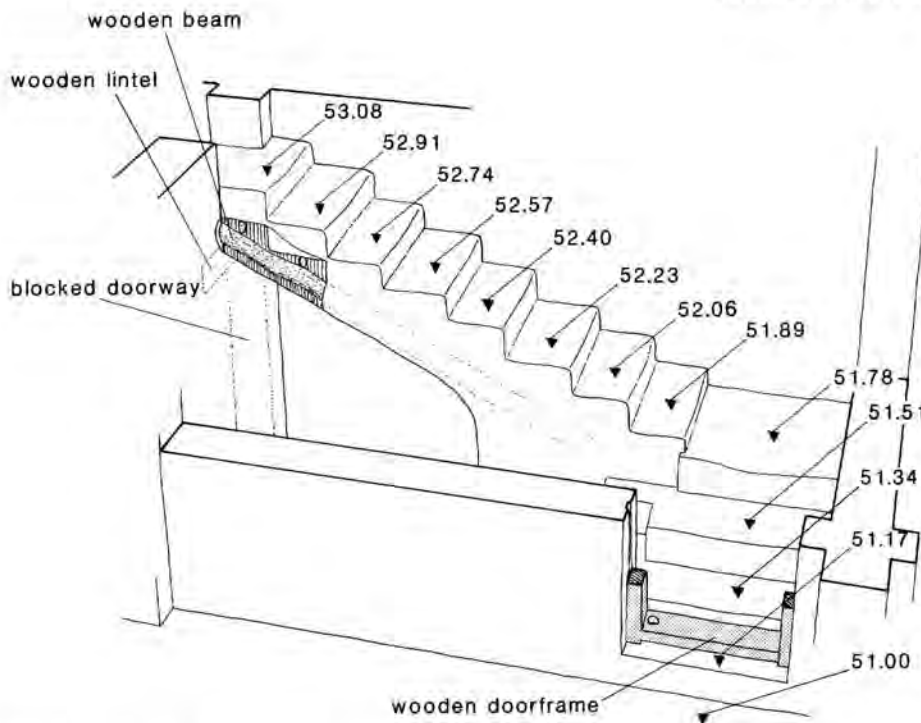


Figure 1.10. Reconstruction of the staircase in house P46.33.

derive from a light doorframe; if a door had been present it would have had to open outwards. The front of the lowest of the steps ran flush with the wall of the Central Room. Beyond this, four steps [3077] are preserved rising east-west to a square landing and filling area 5 altogether. From the landing the edge of a fifth step is preserved at right-angles, whilst a run of bricks which had fallen from the sixth step lay in the rubble (Figure 1.22). Before the steps had been built an L-shaped wall [3180, 3348] had been erected, partly to enable the lowest group of steps to be built as a solid block, and partly to provide a secure seating for angled wooden beams which bore the weight of the upper flight of stairs. The impressions of the ends of these beams, which numbered three, were preserved in the mortar at a height of about 30 cm above the floor (Figure 1.15B). Despite being deeply buried in rubble and probably the most protected part of the house there were no traces of mud plaster on the walls.

The upper flight of stairs ran over one side of a rectangular room, area 4, which measured 2.15 x 1.50 m and had been floored with a layer of packed mud [3309] which had been lost in the north-east corner, opposite a doorway from area 7. The doorway had been 70 cm wide across a threshold [3795] of two courses of bricks, but had been blocked up with a wall [3709] one brick in thickness (Figure 1.15D). Since this created a niche or false door in area 7, a deliberate architectural feature, the blocking could have been done whilst the house was still being built. The only remaining access to this room was then across the second of the steps of the staircase, necessitating an awkward step of nearly 40 cm downwards into the room.

The staircase provides a means of estimating the original height of the roof or floor on to which it gave at the top of the flight. Each of the preserved steps has been made in the common way of setting bricks on edge, and giving each tread a depth of at least one-brick's length. They are thus approximately 17 cm high, with a minimum depth of 34 cm, although the thickness of mortar introduces a degree of variation. We can see that, at the top of the fourth step, the flight turned northwards at right-angles and continued upwards. One Amarna pattern for stairs is a tight twofold turn, with the third and final set running parallel to the first but in the opposite direction. For this to have applied in our house the upper flight would have had to have been supported on the cross wall [3180], otherwise, if the turn had come later, it would have had to rely on an awkward arrangement of wooden beams crossing area 4 in both directions. If it had made a tight

tum, over wall [3180], it would have reduced access to **area 4** to a low triangular hole accessible from the second stair from the bottom, and this seems implausible. The only sensible solution is for the stair to have completed its ascent in a single run northwards. The top step, and its supporting wooden beams, would therefore have rested on wall [3794] and buttress [3306]. It might be thought that the presence of the blocked doorway [3709] would weaken the support, but this could easily have been avoided by resting the steps and beams on a lateral ceiling beam or beams at the north end of the room. Figure 1.10 shows how this could have been arranged. Within the space available in **area 4** seven further steps could be fitted, creating a total number of twelve steps. If, as has been done in Figure 1.10, we add the ideal heights of seven steps (at 17 cm = 1.19 m) to the preserved height of the first five (89 cm), a total height of 2.08 m is obtained, representing a floor to ceiling height of the room beneath of about 2 m. This is the same as the figure derived by a similar calculation for a house in the Workmen's Village excavated in 1985 (AR III: 14-17). This gives us, of course, the height of **area 7** to the north. To what extent we apply it to the rest of the house, and especially to the Central Room, requires a wider discussion which is reserved for Chapter 4.

Area 7, measuring 2.93 x 1.75 m, occupied the north-east corner of the house and was accessible from the Central Room through a doorway 75 cm wide provided with a brick threshold [3796]; there were no marks as from an inserted door frame. Mud plaster remained on the south wall [3794], running across the door-blocking [3709], which had left a niche or false door in the wall. Around the edges of the room the floor has often been lost, but elsewhere patches remained of three separate layers of packed mud floor, from top to bottom [3797] (2 cm), [3790] (5 cm), and [3799] (not fully exposed), each one separated by a thin layer of sand and gravel, [3789] (3.5 cm), and [3798] (1.5 cm). The patches of floor had worn edges, creating an uneven surface, but it was impossible to say if this was original or the product of weathering in the period following abandonment.

Area 6, measuring 2.35 x 1.79 m, lay adjacent on the west, and was also entered from the Central Room through a doorway 80 cm wide. The floor of this room was slightly lower than that of the Central Room, by some 20 cm, but, instead of running in a continuous slope through the doorway, the floor of the Central Room ended in a slight edge where it met the doorway. Although there were no marks in the brickwork this should be taken as a sign that a wooden door frame with sill had fitted here. Of all the rooms in the house this one preserved the most mud wall plaster, some surviving on all four walls. The floor was composed of two immediately superimposed mud layers, [3183] (3.5 cm) over [3747] (2cm), both of which had lost areas in corners and against the west wall [3235].

Areas 9 and 10 were not completely excavated, but form the westernmost rooms of the house. Over **area 9** only a thin cover of surface sand was removed to expose the top of the fill [3326], which was left in place. As the house was being built it was possible to enter this room directly from the Central Room through a door, 84 cm wide, the sides of which had been plastered with mud. It was subsequently blocked with a thin partition wall [3342], in front of which the dais in the Central Room was built. This way of blocking it created a niche or false door in **area 9**, a common feature of Amarna houses. The greater part of **area 10** was excavated to floor level, leaving a portion of the fill in the south-west corner. The room dimensions were 3.73 x 1.78 m. It possessed two doorways. One, 85 cm wide, led from the Central Room across a brick threshold [3704]. A slight vertical groove ran down one of the jamb corners (the north-east corner of wall [3238]), but there were no holes at the base of the jambs or any other marks suggestive of an inserted door frame. A patch of mud plaster remained on the face of the south jamb. The second door communicated with **area 9**, but its full width was not revealed. The brickwork of wall [3343], through which it led, showed no sign that the doorway was other than part of the original construction. Mud wall-plaster survived around the south-east corner of the room, which was floored with a layer [3182], c. 3 cm thick, of mud with patches of ash, which petered out towards the north and lay over the natural desert. A pottery one-handed cup [3321] lay on the floor.

Outside house P46.33 the excavation covered three areas on the north and four on the east. Those on the east could well be subdivisions of a work enclosure attached to the east side of the house; the connection with those on the north is as yet unknown. With none of them was the full extent of the room or space revealed.

Area 11 gave access to two narrow spaces, **areas 12** and **13**, and was probably open to the sky. On the east side the downward slope of the modern ground surface brings it to within 20 cm of the Amarna-Period ground level (see the section, Figure 1.17), and further east still, outside the limit of the excavation, the two must almost merge. This implies that significant structures peter out not far beyond the edge of excavation on this side, and that the court is not much wider than the area exposed in square L15. Likewise on the south the court probably did not extend far outside square L15, for, once the surface sand had been removed, an area of collapsed wall [3071] was revealed which looked as if it had fallen from the south. The fact that the ground to the east was not built up and contained a significant rubbish heap (as picked up on the contour plan, Figure 1.2) supports the view that the areas along the east side of the house actually belonged to it. Removal of the fill deposits exposed a floor [3311] consisting of a 2 cm-thick layer of packed mud which rested on two earlier similar floors, [3316] of 4 cm (which contained some ash), over [3317] of 3.5 cm. To the east the floors faded away and only desert [3099] was left, presumably as a result of erosion. On the uppermost floor lay two stone objects: a limestone seat ([3304]=object no. 8802, Figures 2.35, 2.38) the correct way up, and a quartzite quern stone ([3305]=object no. 8800, Figure 2.40) upside down.

Area 12 was a really a narrow (1.18 m wide) subdivision of **area 11** created through the erection of the partition wall [3345] in which a doorway was left at the north end, strengthened by means of two jambs [3081], [3307]. Lacking a threshold it was presumably not closed off with a door. The three-layered floor of **area 11** continued uninterrupted through the doorway and spread over most of the northern end of the room, as [3310] (2.5 cm) over [3314] (7 cm) and [3315] (5 cm), all with a chaff and gravel content. At the southern end the floors had been lost. Within **area 12** a niche [3344] in the surface of the house wall [3080] had been created by leaving out a single brick, thus giving it the dimensions 34 x 20 cm, but perhaps also by cutting into the bricks above to give it a greater height, although erosion of the wall at this level left this unclear. No plaster remained in the niche, the sill of which was rounded from weathering.

A narrow space of only slightly greater width (1.36 m), **area 13**, opened from the north side of **area 11**, through a doorway 95 cm wide in the partition wall [3098]/[3346]. The floor inside was about 10 cm lower, and to reach it one crossed a broad brick threshold [3177], 1.52 m wide, to which a small projecting step [3303] had been added on the south side. The space was floored with packed mud in which two layers could be distinguished, an upper [3312] of 2 cm thickness, and a lower [3318] of 2.5 cm the mud of which contained some ash. Roofing fragments found in the fill imply that this, perhaps alone of the outer buildings, was roofed. The western end of the north wall [3097] still bore an area of mud plaster tempered with straw on which was a small patch of red paint (Figure 1.15A).

The space was partly occupied by a brick quern-emplacement (Figure 1.11a) of the type common at Amarna, though less well constructed than those at the Workmen's Village (cf. *AR* III: 3-5; *AR* IV: 5-6). It was constructed against wall [3097], in two roughly semi-circular parts. The larger part was formed by a retaining wall [3228] of roughly-plastered bricks a single course thick, reaching a maximum height of 52 cm on the west and 35 on the east (the floor itself being very irregular). It had been built on the existing hard mud floor. The space so formed had been partly filled, to a depth of 22 cm, with charcoal, ash, and silt [3688] mixed with some sherds and pebbles (for the possible significance of the ash, see *AR* IV: 14-15). This had then been covered with a layer of straw-rich mud plaster also containing some sherds, 2-5 cm thick (see the section, Figure 1.12). Towards the west (the rear) this internal surface sloped up, matching, in a general way, the slope of the top plane of the retaining wall. A much lower semi-circular enclosure [3302], more of a trough, abutted it on the east, formed from a low ridge of mud plaster no more than 8 cm above the surrounding floor. The outside sloped gradually down to the floor, whilst the inside had a steeper slope which bore rough grooves in the mud plaster from smoothing with fingers. The trough floor was a little lower (up to 3 cm) than the surrounding floor and was plastered with mud. On the side formed by the main wall [3097] a small area of mud plaster still adhered to the wall over the trough.

It is to be expected that the taller part of the emplacement contained a quern stone (see the discussion in *AR* V: 260-3). A large piece of quartzite of irregular outline [3308] lay against the south side of the emplacement. Of its surfaces only the top was smooth. With the top surface measuring 51 x 35-19 cm, and a thickness of 16 cm, it is considerably larger than the usual

1987 excavation



Figure 1.11. (a) view to the north of the quern emplacement in area 13; (b) reconstruction of quern emplacement showing likely method of use.

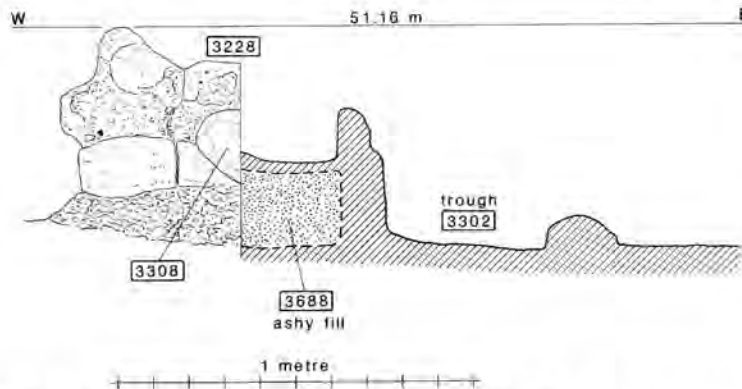


Figure 1.12. Section through the quern emplacement. Original by A. Bomann.

quern (an example of which [3305] was found in area 11), and also much heavier. If set sideways in the emplacement (its long dimension north–south) it would fit into the area of surface damage to the interior of the emplacement, although this had very ragged edges and no sign of a “scar” from the removal of such a stone. It might be expected that the removal of such a large and heavy piece of stone would have inflicted much more damage on the brick emplacement, and it is probably more sensible to consider that this large stone was used for grinding in the place where it was found, on the floor, and that a normal quern stone (e.g. [3305]) had originally been set in the emplacement. Behind the emplacement, in the short space (c. 50 cm) between it and the wall of the house [3080], a rough flattish stone lay on the mud floor, measuring c. 37 x 30 cm, and 9 cm thick. If in its original position, it could have helped to support the feet of the person who leaned forward here to do the milling (Figure 1.11b, for the position adopted see AR V: 270, Figure 12.12). It should be added that this area also produced three stone rubbers or hammerstones (object nos. 8422, 8423, 8519, Figure 2.29).

Beyond area 13 to the north lay area 14, almost certainly an open court bounded on the north by a wall [3753] of single-brick thickness which is a prolongation of the rear wall of house P46.33. It is possible that it was actually entered from area 13, for, at the eastern end of its southern wall [3097], as it disappears into the side of the excavation, a brick projects which might be the side of a doorway. Since area 14 contains an oven, a suitable complement to a quern emplacement, this might seem a very suitable arrangement but, as will be noted below, it was perhaps rather a kiln than an oven and had gone out of use before the house was abandoned.

The area had originally been floored with a layer of mud [3319], 3–5 cm thick, which had been resurfaced with a second layer [3313] which was much thicker (10–14 cm), although patches of it had been lost. Along the west and south sides a 10–20 cm-thick deposit of silt, ash, and fine organic matter [3189=3893] had built up, under which the mud floors had been only partially preserved or not preserved at all, perhaps because the accumulation had begun before the floors were made. Along the north side a circular cut had been made through both floors, and an oven or small kiln [3811] had been set inside, fixed in place with mud plaster (Figure 1.13). The oven was not the usual purpose-made liner of lightly fired clay but the body of a reused pottery storage vessel (probably a “meat-jar” placed upright but with its base removed), c. 50 cm in diameter, and preserved to a height of only 30 cm, which means that it must have lost a good deal of its original height, as well as some of its circumference, although there were no signs of disturbance. The oven ring was filled with charcoal and ash [3812]. Beside the oven was a second smaller but elongated cut [3706] which, from its rounded profile at the west end, could have been an emplacement for an earlier oven, though one of smaller size. Much of the north side of the area was covered to a depth of 23 cm with a deposit of ash and organic soil [3708] which also filled cut [3706] and unbrokenly covered the oven and its fill. Both this deposit and the similar one [3189=3893] in the south-west corner probably derive from the process of heating the oven. It is clear that the oven or kiln had gone out of use and been largely destroyed before activity in the area ceased.



Figure 1.13. The northern part of the house and adjacent space, **area 15**, at the end of excavation, cleaned to floor level, with the base of pottery oven [3811] in the north-west corner of **area 14**. **Area 15** lies beyond, also cleaned to floor level. The collapsed wall [3174] still covers **area 16**. View to the north-west.

This completes the description of the areas which made up the house. Along the north side lay three more which may or may not have been connected. Only one of these, **area 15**, was excavated to floor level (Figure 1.14). It was clearly an open area, but whether bounded on north and east by walls or left open on these sides is not yet known. In the north-eastern part of the area lay the edge [3814] of what must be a large pit filled with dark earth [3707] containing decayed brick fragments, sherds, and ash, as well as a distinct ash lens [3822]. The excavation of this fill was not completed. A full picture of the stratigraphy requires the relationship to be established between this rubbish pit and the adjacent floors and deposits.

The south-west corner area of **area 15** (that part protected by walls) was largely covered with a two-layered mud floor, an upper [3756] of 16cm and a lower [3813] of 4 cm, separated by 1.5 cm of sand and gravel [3891] (what appeared to be a floor [3888] was also noted beneath the



Figure 1.14. Mostly area 15 with mud floor [3756] exposed. Note the sloping base [3800] to wall [3231] in the background. In the foreground lies the unexcavated pit. View to the south-west.

wall [3753] but did not run northwards into open space). Its relationship to the rubbish deposit in the north-east corner is not wholly certain; the absence of floor over it could be because the pit was dug into the floor, co-existed with it as a place for dumping rubbish, or (as has been noticed elsewhere) its preservation has been adversely affected by the nature of the other deposits with which it has lain in contact. A significant observation was that some of this material (separately numbered [3887]) was seen to run beneath floor [3813] where it reached the edge of the pit, making it likely that one or other of the last two possibilities is correct. However, the preserved parts of the floor were also covered with a very similar rubbish deposit [3755], 16 cm in depth, which tends to narrow the options to that of, at least partial, contemporaneity. Close to the corner between walls [3231] and [3892] an irregularly oval cut [3809] had been made in the floors, 70 x 47 cm, and 18 cm deep. A number of sherds lay almost vertically around part of the side. These were perhaps packing for an oven removed before the site was abandoned, the presence of which

would be consistent with the dark earthy material [3755] which occupied this area and completely covered the cut. It seems to have been felt that the activities in this area endangered the stability of the adjacent walls, which had little in the way of foundations, for a sloping course of bricks plastered with mud [3800] was laid against their base (Figure 1.15C). Coinciding with part of this, the outer course of bricks of wall [3231] presented a very clean surface on which patches of mortar remained. These preserved the impression of a length of wood which had perhaps been inset into the brickwork to prevent the brickwork cracking, reflecting the same fear as prompted the construction of the embankment.

Of area 16 only a narrow strip within square L16 was excavated to the level of the original floor [3810], a mud-packed surface which survived only in a small patch beside wall [3892]. Over this and the remainder of the small area exposed lay an organic floor deposit [3900] with a maximum thickness of 15 cm. The only other feature exposed was an extra course of bricks [3889] run along the base of the north side of wall [3231], perhaps to strengthen it in the same way as the mud packing [3800] in area 15. The part of the area which lay in square K16 was excavated down only to the principal level of collapsed brickwork [3174] (Figures 1.13, 1.14). Likewise in area 17 only the loose surface deposits were removed, revealing a regular area of rubble [3173] in the south-east corner which, to judge by its prominence and solidity (Figures 1.19, 1.21), might be covering an underlying feature. Area 18 in the north-west corner of square K16 was scarcely touched.

1.5 Constructional notes

The condition of the house at the end of excavation, with plaster covering parts of some walls and others showing the effects of weathering, meant that constructional details and brick sizes were often hidden. The following brief notes are therefore somewhat sketchy. The house proper was built throughout of mud bricks, the walls having the thickness of one brick length, bricks frequently laid in alternate header and stretcher pattern with little attention to offsetting vertical joints. The north wall of area 1 [3339] is probably of this type. The reason why it appears on the plan as if having the thickness of one brick width only is because the deposits on one side, in area 9, were not excavated, and are probably covering a parallel brick course which had been eroded to a lower level than the visible one. The alternating header/stretcher pattern was not universal, however; for example, in wall [3345] of area 12 several courses of stretchers were laid together. All walls outside the house were built with a thickness of one brick width. In many places the lowest course of bricks in the house walls consisted of bricks laid on their edge. Some of the bricks in the bottom course in area 2 showed fresh header-faces with twin vertical mud projections, caused by flat vertical grooves in the end wall of the wooden mould in which they had been made. This has been noted on bricks used in the flooring of house Q44.1, recleared in 1992.

The average dimensions of bricks recorded during the course of excavation was 32 x 16/17 x 9/10 cm, although some bricks reached lengths up to 36 cm. This variation was then reflected in the wall thicknesses. For example, walls [3078] (east wall of area 3), [3236], and [3237] (enclosing area 6 on the east and south) are built entirely from slightly larger bricks, 36 cm long.

In the initial laying out of the foundations no more than probably a single brick's depth was set in a shallow trench scooped in the sand. To judge from the plan itself (Figure 1.16a) the builder had started by laying out two adjacent sides but failed to make them a true right angle, the deviation being about three degrees. The excavation only exposed one of the outer corners, but if one adds wall thickness of 32 cm to the internal measurements, one obtains an outside length of 8.48 m for the north wall and 8.34 m for the east wall. These could represent an intended 16 cubits (8.37 m) if a royal cubit of .523 m were in use but, since the internal divisions of the house correspond more closely to the use of the short cubit (.45 m), it is perhaps a mistake to assume that a formal modular approach was in the builders' mind at all. Furthermore, until the surrounding area is excavated we do not know what the local constraints were on laying out this particular house. The builder then probably obtained the further corner by stretching his cord from the outer ends of the newly fixed walls, marking arcs in the sand, and so producing, from their crossing point, a slightly rhomboid shape. One might guess from the plan that he then worked inwards towards the Central Room rather than starting with its dimensions. What he may have

House P46.33: the excavation

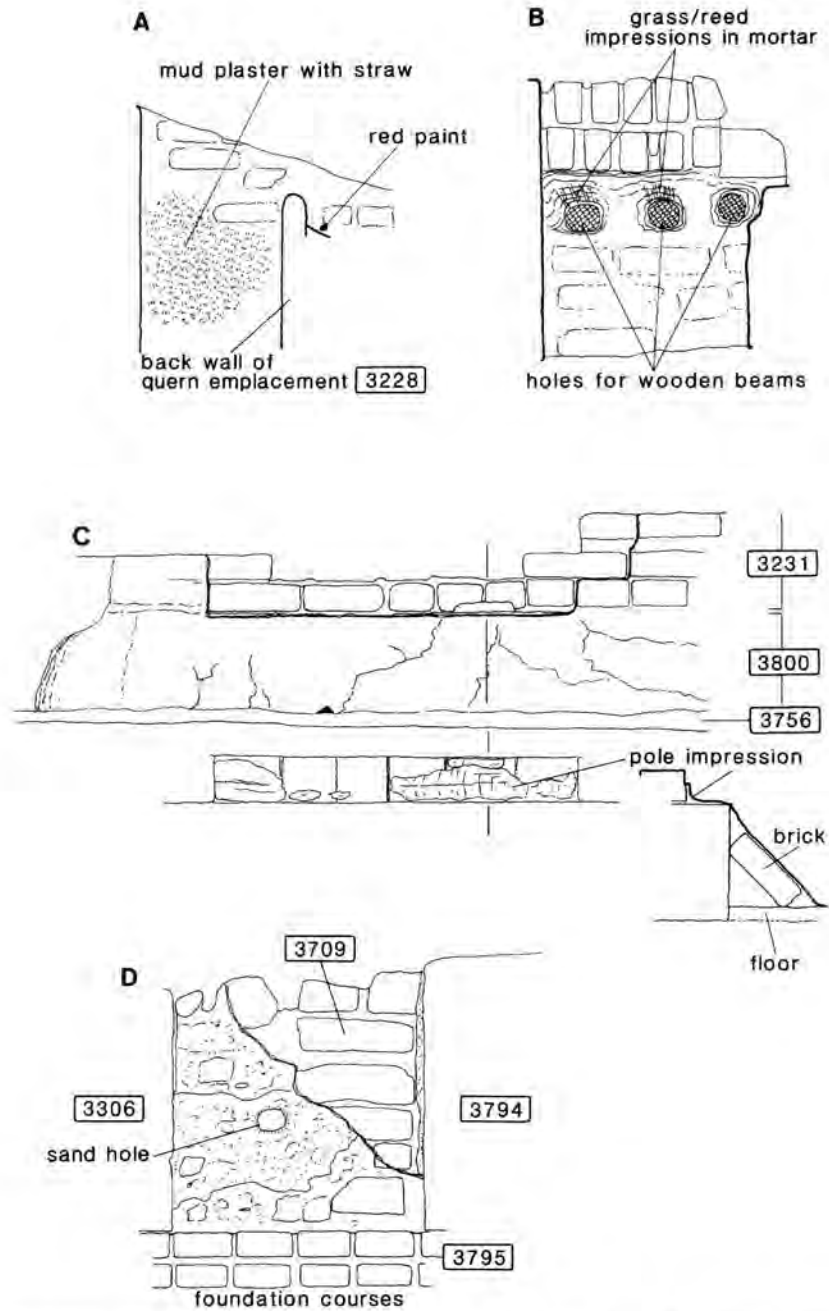


Figure 1.15. Sketches of constructional details: (A) the dividing wall between areas 13 and 14 (to north); (B) holes for wooden beams to support the staircase (to south); (C) sloping wall-footing in area 15; (D) blocked door between areas 4 and 7.

done was to mark off, not very accurately, divisions along the sides to create the rooms which surrounded the Central Room. Figure 1.16a contains a suggested order of laying out the internal walls. To create the rooms on the north, west, and south sides the same unit of measurement was used which would have given the inside faces of the internal walls of these rooms (on the cubit scale the nearest multiple would be four of the short cubits, 1.80 m). On the east, however, the rooms were narrower. The space that was left was the Central Room (area 3) but, because the eastern rooms were narrower than the rooms on the other three sides, it finished up wider in the

1987 excavation

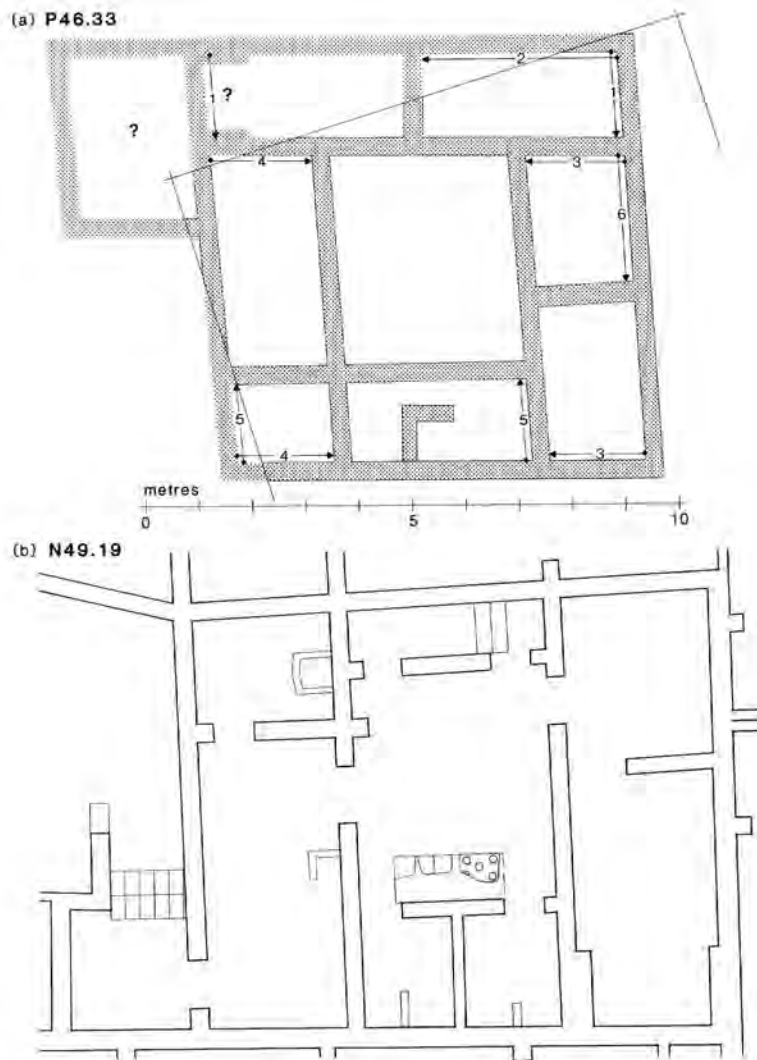


Figure 1.16. (a) outline plan of the wall framework of P46.33, partially restored, with the possible order of laying out the internal walls indicated; (b) the plan of a house of similar size, N49.19 (after *COA I: Pl. I*).

cast-west direction than the north-south. The last step was to insert the room dividers between areas 4 and 5, between areas 6 and 7, and between areas 9 and 10. The first two he set at right-angles to the outside walls.

The whole process of laying out and digging shallow foundation trenches could probably have been done in half a day. When building started a continuous network of walls was probably laid which did not recognize doorways. When the walls were built up and doorways were left, the foundation courses either provided a threshold in themselves or served to support a wooden doorframe. During the course of building two of the doorways were blocked up to half their thickness, creating false-door recesses on one side, probably a deliberate decorative feature.

The internal walls of all excavated rooms apart from areas 2 and 4/5 bore patches of mud plaster tempered with straw (Figure 1.9 illustrates a good example). Nowhere, however, was any white colouring found. A few traces were noted within and around the house of a yellow pigment. Some were on three of the loose bricks in unit [3333], the result of wall collapse into area 7; a deposit was found inside an amphora in rubble deposit [3186] in area 13 (traces of red

also were on the break and exterior surface); and from **area 12**, unit [3229], came a fragment of quartzite with traces of yellow on its surface. Whether this was the result of applying this colour to whole walls could not be decided. A small patch of red pigment adhered to the plaster on the south face of wall [3097] in **area 13** (Figure 1.15A).

The house itself, of around 70 sq m if without entrance porch and 80 sq m if it did possess one, is very much of "average" size, mid-way in the common range of sizes of Amarna houses (cf. Shaw 1992: 156–8). At this size, few houses possessed an entrance porch. One house of similar size to P46.33 can be cited, however, which was provided with one and also with a bedroom with alcove and ante-room, an arrangement to which **areas 9** and **10** of our house perhaps conform. This is house N49.19 (COA I: Pl. I, our Figure 1.16b). It is interesting to note, however, that in this latter case the front rooms seem to have been provided with brick constructions, perhaps troughs or quern emplacements, of the kind which, in the case of P46.33 and many other houses of this kind of size, were placed in outbuildings. Further discussion of differing room uses across the full range of Amarna houses lies outside the scope of this chapter, however.

1.6 The nature of the fill

The various rooms and spaces were filled with deposits derived from two quite different sources, extraneous sediments (sand and dust) blown in from beyond the house and locally derived rubble in various stages of decay from the collapse of the structure (Figures 1.18–1.22). The filling of the spaces and the formation of the site as we found it took a long time — how long will be discussed in Chapter 4 — and was made up of numerous events, principally the fall of particular sections of wall, and the deposition of sand from individual sandstorms. The full story of site formation is normally quite a complex one, difficult to unravel, yet worthwhile. In this case it bears on what we make of the distribution of the various classes of finds in and around the house and on how we reconstruct the physical shape of the house. In this section the deposits will be summarised area by area, in the order of deposition, i.e. from bottom to top, diagrammatically summarised in Figure 1.23. How we should put them together into a taphonomic tale will be reserved for a section in Chapter 4.

The floor of **area 1** was covered with a structureless deposit, c. 8–10 cm thick, of mud and roofing fragments [3703] which must be primarily from the collapse of the roof. Above this lay a much thicker deposit of brick rubble, mud, and sand which was removed as three units [3686], [3685], and [3690]. It lay fairly flat within the room to a depth of some 60 cm, leaving, over the eastern part, some 40 cm of wall tops exposed. Only one patch of [3685], lying across the middle of the room, retained a significant amount of its original pattern of articulation, with perhaps seven courses. It gave the impression of belonging to wall [3340], which would thus have had a height of at least 1.70 m. The three units were not arbitrary divisions of a homogeneous fill but seemed to represent stages of collapse and weathering. In the course of removing unit [3685], a group of bricks in the south-east corner of the room, which rested on mud fragments and a patch of weathered silt, stood out as if they had been deliberately placed rather than that they had accidentally fallen (Figure 1.8b). In this position they had themselves become weathered. The pile could have been placed as a rough step to help someone down into the room, something which should be borne in mind when assessing other evidence for people having visited the house ruin long after the Amarna Period. Beside the pile and within unit [3685] lay part of a limestone table (object no. 8801, Figure 2.37).

Subsequently very little more rubble fell into the room, which filled up with sand [3325] until the stabilization of the present surface [3301] of sand and gravel, the latter material presumably the heavy residue derived from the weathering away of the last remnants of standing walls and rubble. The exception to this was the apparent later collapse of a limited patch of brickwork [3323] which fell beside wall [3687] and was perhaps another piece of wall [3340] falling at a different time.

These deposits continued in very similar fashion across **area 2** as well, beginning from below with c. 33 cm of partially decayed rubble and silt [3705] in which no roofing fragments could be recognised. Then came about 55 cm of brick fragments, mud, and sand ([3684] and [3690]) which filled the room to within 50 cm of the wall tops. A stone grinder (object no. 8840, Figure

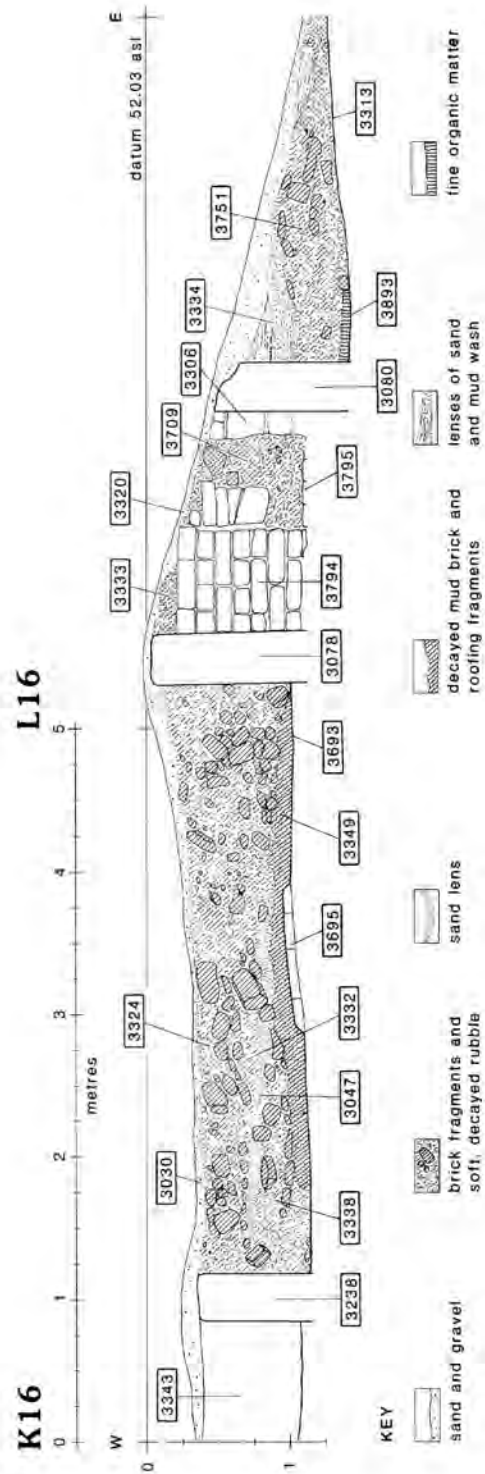


Figure 1.17. Section across the central room (area 3) of the house. Original by A. Bomann.



Figure 1.18. Square L15 viewed to the south-west after removal of the topsoil. Wall [3080] crosses the picture diagonally. Rubble fills the staircase, areas 4/5 in the upper right of the picture, sand and rubble fill areas 11–14 in the lower and left part.

2.30) lay within [3690]. Some of the fallen brickwork of [3690] which lay along the north side had presumably fallen from wall [3079]. Again the final recorded process was the filling of the remaining space with sand [3076] until the present sand-gravel surface [3301]=[3031] stabilized.

For area 3 the descriptive record is supplemented by the drawn section (Figure 1.17). The mud floor [3693] was covered with an even layer about 15 cm thick of mud brick and fragments of mud bearing the impressions of roofing material [3349], all decayed to a greater extent than the overlying material. This must represent the fall of the ceiling immediately above, which then lay as an exposed deposit before further collapse occurred. Between this and a thin cover of sand and pebbles [3030] was a nearly uniform deposit of brick fragments and earthy soil with a total thickness of between 50 and 75 cm, which was removed in three spits of roughly equal thickness, from top to bottom [3324], [3332], and [3338], except in the south-eastern part where an initial layer was removed as unit [3322]. The main deviation from uniformity was that the uppermost

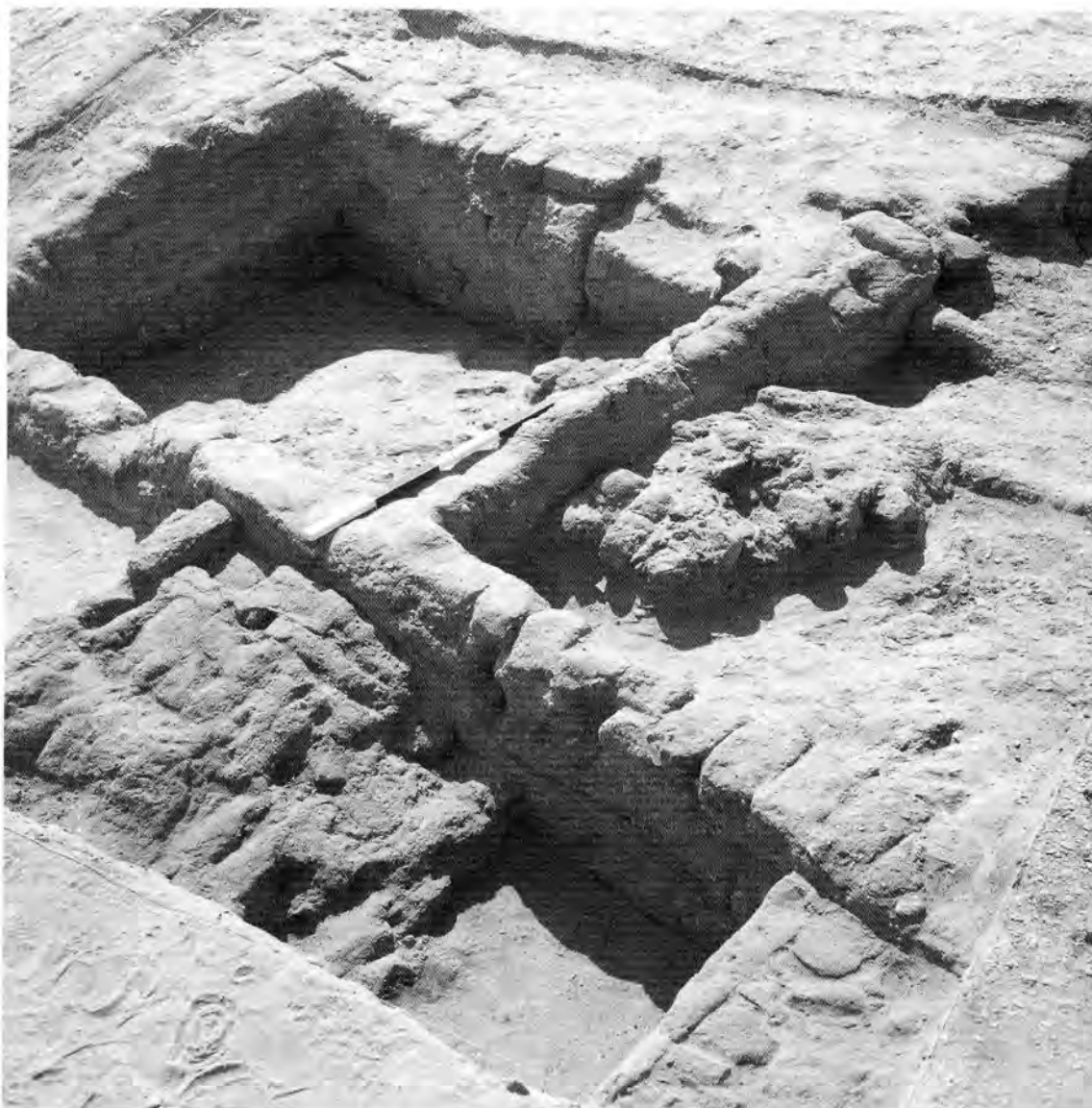


Figure 1.19. Square K16 viewed to the south-east following removal of superficial deposits. The deeply exposed room is area 6. Behind is a small strip of area 3 with rubble filling it almost to the surface. Area 17 lies in the foreground.

unit [3324] was sandier. The whole deposit did not represent, however, a single event, for over the western part of the room a lens of tan-coloured sand, 11 cm thick, had blown in between the deposition of [3338] and [3347]. Towards the south-west corner the upper deposits produced two conspicuous finds, two cow femurs lying parallel in unit [3332] (the principal elements in a group of bones from this deposit) and, above them in [3324], the lower part of an amphora. From the way they lay it could be judged that they could well have been introduced during pauses in the accumulation.

Rubble filled the doorway into area 6 which, unusually, was filled with sand rather than rubble. The junction between rubble and sand in the doorway seemed to follow a straight line (Figure 1.19), which gave the superficial impression that the door had been blocked. The straight edge could perhaps have arisen from the brickwork above the doorway falling vertically downwards, and the process of excavation might also have added to the effect.



Figure 1.20. The northern part of house P46.33 and adjacent space, **area 15**, with fill units removed to expose floor deposits; also the spaces to the north, **areas 15–17**, with the lower fill units exposed, principally the collapsed wall [3171] and deposit [3754], which contained the Late Period sherds. View to the west.

A striking aspect of the deposit was the occurrence of mud roofing fragments throughout, even in the uppermost unit [3322] where pieces of rounded beam casing were found. Some from unit [3338], which were particularly well preserved, had a dark brown colour, perhaps from termite activity through the eating of the adjacent roofing materials. The impressions were of poles, the ribs of palm leaves (*gereed*), and rounded beams and, especially in the upper units [3332] and [3324], of reeds as well. Some pieces had the remains of a packed mud floor on the reverse side. The same two upper units also contained the main quantity of sherds found in the room, inviting the explanation that they had been laid as an outer layer over the roof to increase resistance to weathering and to help absorb moisture from light rainfalls. There are, however, difficulties in accepting this, something which will be considered in Chapter 4.

The narrow space comprising **areas 4 and 5** had contained the brick staircase. Much of **area 4** had lain actually beneath the staircase and, before this had collapsed, a layer of fine silt [3240] containing some charcoal fragments had accumulated to a depth of some 13 cm. This deposit produced, apart from sherds and a few bones, seven objects, amongst them two stone rubbers or hammers (nos. 8638, 8639) and a faience bunch of grapes (no. 8656). Of all of the deposits found in the house this is the one most likely to have remained undisturbed after the house was abandoned, and is presumably dust which accumulated during and after occupation. The unit immediately above [3239], 18 cm thick, was likewise silt but with an admixture of crumbled brick, perhaps from the beginning of the collapse of the overlying stairs. Amongst the objects

1987 excavation



Figure 1.21. Plan of the fill units in house P46.33. The separate plan along the top is at a lower level. Originals by A. Bomann.

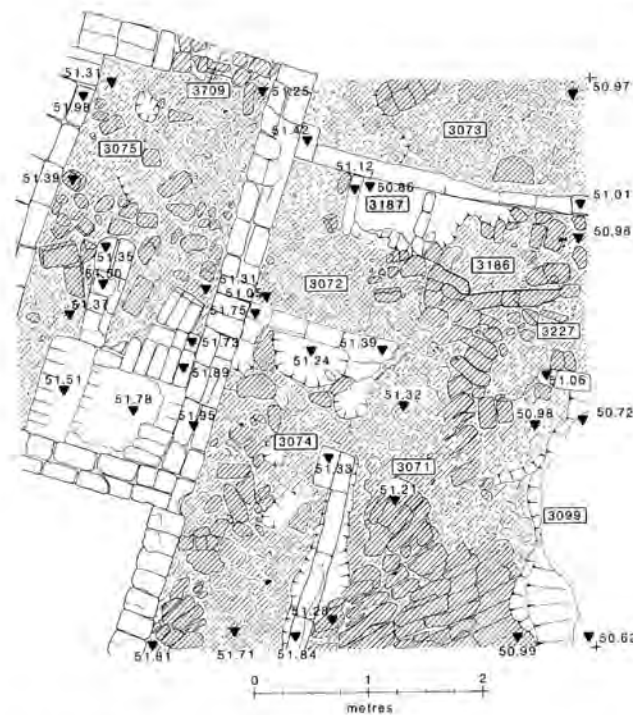


Figure 1.22. Plan of the fill units in the south-east of the excavation, at a lower level than those in the previous plan.

found were a hammer stone and two worked pieces of limestone (nos. 8705, 8634, 8635), presumably part of the same group as those lying below. The collapsed stair occupied the remainder of the volume almost to the modern surface, and was removed as two units, [3067] above [3075]. The latter contained many complete or nearly complete bricks, including a row of three lying on their edges which belonged to one of the steps which had dropped downwards. Included within the upper were pieces of mud containing impressions of the wooden beams which had supported the stairs. Despite the fact that no disturbance had occurred in this area, a further stone rubber (no. 8259) was found even in the uppermost unit [3067]. This whole sequence is thus of some importance in demonstrating that, in circumstances where post-collapse disturbance is virtually ruled out, objects become vertically scattered. A little of unit [3075] also spread over the lower steps of **area 5**, whilst the upper steps and landing had been covered by some of unit [3067].

The north-west corner room of the house, **area 6**, stood out by virtue of the small quantity of rubble found (Figure 1.19). The remains of the mud floor were wholly covered by a deposit of coarse reddish sand and gravel [3178], about 23 cm thick. It was in this deposit, in the north-west corner of the room, that the two mud jar stoppers (nos. 8426 and 8427) were found. Over the eastern two-thirds of the room this passed directly upwards into a further deposit of sand [3033]. Of rubble there were two deposits: a lens [3171], with a maximum width of 73 cm and depth of 21 cm, which lay along the west wall [3235] and looked as though it had fallen from it as a result of a channel having been scoured by weathering into its face; and a thin patch of decomposed rubble in the south-east corner in the top of unit [3033]. The rubble fill in rooms comes primarily from the collapse of walls, so that its general absence here is presumably to be explained by the fact that the surrounding walls generally collapsed outwards. Even so, however, one would have expected there to have been a layer of earth or rubble on the floor from the fall of the roof, but of this there was no trace at all. One is therefore led to conclude that this room was open to the sky and began to sand up once the house was abandoned.

The adjacent room on the east, **area 7**, provides a nice contrast with **area 6**. The floor was covered with a 30-cm deposit of silt and decomposed brick [3749] which contained roofing fragments (as well as the little cluster of fox-head pendants, nos. 9020a-e). It passed upwards into a similar deposit [3333] in which pieces of tumbled brick were more prominent. This is the expected record of roof fall followed by wall collapse.

For **areas 8** and **9** there is no record of fill, for excavation was not taken beyond the removal of surface debris to expose wall tops.

Area 10 is the remaining room of the house. Much of the space was filled with 50 cm of rubble, sandier towards the top and slightly ashy where it lay over the floor. It was removed in three more or less equal spits, [3172] over [3179], in turn over [3181]. Mud roofing fragments spread through unit [3179] and included a piece of casing from a beam and several fragments with reed impressions. A lesser quantity continued into [3181].

With **area 11** we move to the group of spaces (**areas 11 to 14**) which adjoined the house on the east. In all of them the fill deposits tailed off steadily towards the east. Over the floor lay 20 cm of decayed brick rubble [3185], to a large extent reduced to silt. Incorporated within it was the collection of objects marked on the plan, Figure 4.11. It was sealed by a layer of collapsed brickwork [3071] a good part of which had retained the shapes of the individual bricks. The visible pattern of collapse showed that the southern part had almost certainly fallen northwards from the southern wall of **area 11**, which was not exposed by excavation, whilst a patch on the north could perhaps have fallen from wall [3098]. The pattern of bricks is a clear demonstration that it had remained undisturbed since it fell; nevertheless, despite its origin and relative height above the floor, it yielded objects (including two stone grinders or rubbers, nos. 8370 and 8430, from near the north-west corner), as well as sherds and bones. Following the collapse of the walls a layer of sand [3069] had accumulated over the rubble (Figure 1.18).

In **area 12**, the compartment which had been built along one side of **area 11**, the lowest fill unit [3230] was the silt and fine organic deposit which had probably built up during the time of occupation. The room was otherwise largely filled with rubble, the lowest 18 cm a mixture of crumbled brick and silt [3229] in which a number of objects were found. Above this was a 20-cm layer of dense brick rubble [3074], probably from the inwards collapse of the partition wall [3345]. Above this came the continuation of the sand layer [3074], here replaced by brick fragments which had fallen from the main house wall [3080].

Area 13 contained the quern emplacement which had suffered little damage, despite the fact that the tops of its walls projected slightly above the rubble fill. The narrow surrounding spaces were floored with an ashy-silt deposit [3188]/[3226] which was probably contemporary with the period of occupation; above this and partly over the quern emplacement lay a mixed deposit of sand and brick rubble, the greater part of which was designated unit [3072], with a depth of around 23 cm, which formed a continuation of unit [3071] in **area 11**. Part of this unit (which included the stretch of articulated bricks [3227]) comprised bricks fallen from the adjacent walls (probably in the main from wall [3098]). It also included mud roofing fragments, thus indicating that, in all likelihood, the quern room possessed a solid roof. An area of sandy rubble [3186] which lay over the basin [3302] attached to the quern emplacement was treated separately, and found to contain part of an amphora which had been re-used as a container for yellow pigment, and a hammer stone (object no. 8423). All of these rubble-fill units were sealed by a deposit of sand and weathered rubble from the decay of the house [3068] (Figure 1.18).

Area 14 was an open space floored with mud. It was covered by 20 cm of silt and decomposed brick [3073]/[3751] containing numerous sherds and a number of small objects, and this was, in turn, sealed by a deposit of sand [3068]/[3334] which had, over the northern part, formed a muddy crust from rainwash. Figure 1.17 includes a section across the middle of this area. These deposits were consistent with a build-up of sediments from the slow decay of the surrounding buildings, especially the house itself.

With **area 15** we are outside the house and its likely outbuildings on the east, and might be looking at ground which was open to north and east. One of the first deposits to form was a mixture of brick tumble and mulched mud [3754] probably derived from the eastwards collapse of wall [3892]. Over this was a layer of brick rubble [3335], 20 cm thick, which ran over the western part of this area into the adjacent **area 16** to the west. The pattern of the fallen bricks suggests that this layer is the remains of the north wall of the house [3231] which had fallen

outwards. Along the eastern part of this wall, roughly the eastern half of the back wall of **area 7**, the top of the wall shows a clean stepped "fracture" where a slab of the wall has fallen away, apparently because a timber beam had been inserted into the brickwork here and had eventually been eaten away. Laterally to the east this deposit gave way to another, only 11 cm thick, of silt and pieces of crumbled brick [3336], which seems just to represent the weathered edge of [3335] and an accumulation of sand. Part of an amphora [3337] rested on top of it. Some degree of merging with an underlying fill of a rubbish pit (not excavated) had probably taken place, to judge from the sherds and bone fragments found within this layer.

Area 16 was excavated to floor level only in the narrow strip which lay in square L16. Here the organic floor deposit [3900] was covered with a bank of brick rubble and sand [3754] (which also ran into **area 15**, possibly as a different deposit) which sloped down from north to south and which had presumably built up against the stump of the northern wall of the area which lay outside the limits of excavation. Close to the edge of the square was the beginning of a sheet of articulated collapsed brickwork [3174] which covered the rest of **area 16** and was left in place (Figures 1.13, 1.14). It had fallen on to the sloping bank of underlying debris [3754]. The preservation of the wall's structure was very clear, showing that it had consisted of a single stretcher-course of bricks. It cannot, therefore, have fallen from the north wall of the house [3231], which was built in alternating header and stretcher courses, but must be the fallen remains of the northern enclosing wall to **area 16** which lay beyond the excavation limits. Over this again was a 5–10 cm layer of sand, and above this the continuation of [3335], the remains of the collapse of the house wall [3231], which ran westwards across square K16 as well, as unit [3034], close beneath the present surface of the ground. This sequence is of particular interest on account of the Late-Period sherds which provide some measure of the length of time that the walls of Amarna houses stood after the site was abandoned (see Chapter 4).

In **area 17** the excavation was also left unfinished, although, over the western part, the removal of the upper fill units in fact exposed the floor. In the eastern part, however, a packed mass of mud brick [3173] was left in place (Figure 1.19). Over both parts a deposit of sand and dust [3066] had accumulated, and on top of this lay a patch of collapsed brickwork [3035] which had probably come from the house wall [3231] and was, therefore, a continuation of [3034] and [3335].

Of **area 18**, which occupied the north-west corner of the excavation, removal of the sand [3066] exposed the top of a rubble unit [3176], which was left in place.

1.7 Lists of units and area matrices

Table 1.1 is a list of excavation units arranged according to area. Each entry is accompanied by basic description and contextual information, which uses a system of standard abbreviation which has been found very useful in answering common queries which arise during post-excavation work: what do such-and-such units mean in terms of their context and stratigraphic position; how closely can they be fitted to the period of occupation; is there a risk of recent disturbance? Further details on many of them will be found in the main body of the text. The "character" of each unit is given by one or more words from a keyword-list of standard descriptive terms. "Type" provides abbreviated designations for those units most likely to represent the original site and the immediately ensuing processes of site formation, as follows:

fd floor deposit
 st structural element
 fn furnishing
 ud unturned ancient deposit above ancient floor or ground

also

sf modern surface

1987 excavation

The column labelled "phase" recognises only five divisions, thus:

- nat natural pre-Amarna Period desert
- ap Amarna Period
- pa post-Amarna Period
- mod modern
- exc derived from the current excavation

In Table 1.2 the same list has been rearranged by area. It provides the basis for the matrix of Figure 1.23, which summarises the stratigraphic relationships of the fill units, omitting the structural units.

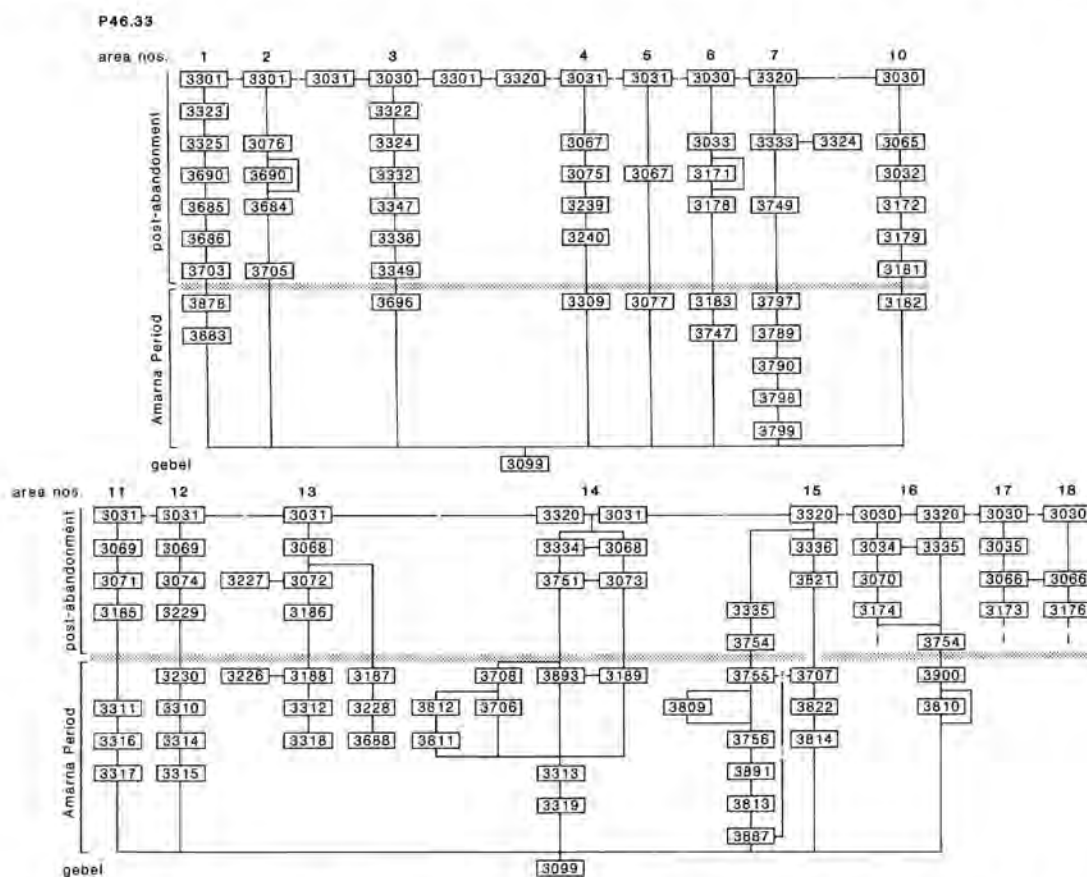


Figure 1.23. Stratigraphic matrix which summarises the fill units in the areas of P46.33. Structural units are omitted.

Table 1.1. List of excavation units, arranged numerically

Unit	Area	Char.	Type	Phase	Equivalences	Comments
K16 3030		sand	sf	pa	=K15.3301=L15.3031=L16.3320	
L15 3031		sand	sf	pa	=K15.3301=K16.3030=L16.3320	
K16 3032	10	rubble	ud	pa		
K16 3033	6	sand	ud	pa		
K16 3034	16	rubble	ud	pa	=L16.3335	
K16 3035	17	rubble	ud	pa		
K16 3065	10	sand	ud	pa		
K16 3066	17,18	sand	ud	pa		
L15 3067	4,5	rubble	ud	pa		
L15 3068	13,14	sand	ud	pa	=L16.3334	
L15 3069	11,12	sand	ud	pa		
K16 3070	16	sand	ud	pa		
L15 3071	11	rubble	ud	pa		
L15 3072	13	rubble	ud	pa	=L15.3227	
L15 3073	14	rubble	ud	pa	=L16.3751	
L15 3074	12	rubble	ud	pa		
L15 3075	4	rubble	ud	pa		
K15 3076	2	sand	ud	pa	=L15.3076	
L15 3076	2	sand	ud	pa	=K15.3076	
K15 3077	5	steps	st	ap	=L15.3077	
L15 3077	5	steps	st	ap	=K15.3077	
K15 3078	3	wall	st	ap	=L15.3078=L16.3078	
L15 3078	3	wall	st	ap	=K15.3078=L16.3078	
L16 3078	3	wall	st	ap	=K15.3078=L15.3078	
K15 3079	2	wall	st	ap	=L15.3079	
L15 3079	2	wall	st	ap	=K15.3079	
L15 3080	2,4,5	wall	st	ap	=L16.3080	
L16 3080	7	wall	st	ap	=L15.3080	
L15 3081	12	jamb	st	ap		
L15 3097	13	wall	st	ap		
L15 3098	13	wall	st	ap		
K15 3099		desert		nat	=K16.3099=L15.3099=L16.3099	
K16 3099		desert		nat	=K15.3099=L15.3099=L16.3099	
L15 3099		desert		nat	=K15.3099=K16.3099=L16.3099	
L16 3099		desert		nat	=K15.3099=K16.3099=L15.3099	
K16 3171	6	rubble	ud	pa		
K16 3172	10	rubble	ud	pa		
K16 3173	17	rubble	ud	pa		
K16 3174	16	rubble	ud	pa		
K16 3175						cancelled
K16 3176	18	rubble	ud	pa		
L15 3177	13	step	st	ap		
K16 3178	6	sand	ud	pa		
K16 3179	10	rubble	ud	pa		
L15 3180	4	wall	st	ap		
K16 3181	10	rubble	ud	pa		
K16 3182	10	floor	st	ap		
K16 3183	6	floor	st	ap		
K16 3184	6	cleaning		exc		
L15 3185	11	rubble	ud	pa		
L15 3186	13	rubble	ud	pa		
L15 3187	13	ash	ud	ap		fill of L15.3228

1987 excavation

L15 3188	13	organic	fd	ap	=L15.3226	
L15 3189	14	organic	fd	ap	=L15.3893 ?	
L15 3226	13	organic	fd	ap	=L15.3188	
L15 3227	13	rubble	ud	pa	=L15.3072	
L15 3228	13	quem emp	st	ap		
L15 3229	12	rubble	ud	pa		
L15 3230	12	organic	fd	ap		
K16 3231	6	wall	st	ap	=L16.3231	
L16 3231	7	wall	st	ap	=K16.3231	
K16 3232	10	wall	st	ap		
K16 3233	17	wall	st	ap		
K16 3234	16	wall	st	ap		
K16 3235	6	wall	st	ap		
K16 3236	6	wall	st	ap		
K16 3237	3	wall	st	ap		
K15 3238	3	wall	st	ap	=K16.3238	
K16 3238	3	wall	st	ap	=K15.3238	
L15 3239	4	rubble	ud	pa		
L15 3240	4	silt	ud	pa		
K15 3301		sand	sf	pa	=K16.3030=L15.3031=L16.3320	
L15 3302	13	quem emp	st	ap		
L15 3303	11	step	st	ap		
L15 3304	11	seat	fn	ap		object no. 8802
L15 3305	11	quem	fn	ap		object no. 8800
L15 3306	3	jamb	st	ap		
L15 3307	11	jamb	st	ap		
L15 3308	13	quem	fn	ap		
L15 3309	4	floor	st	ap		
L15 3310	12	floor	st	ap		
L15 3311	11	floor	st	ap		
L15 3312	13	floor	st	ap		
L15 3313	14	floor	st	ap	=L16.3313	
L16 3313	14	floor	st	ap	=L15.3313	
L15 3314	12	floor	st	ap		
L15 3315	12	floor	st	ap		
L15 3316	11	floor	st	ap		
L15 3317	11	floor	st	ap		
L15 3318	13	floor	st	ap		
L15 3319	14	floor	st	ap	=L16.3319	
L16 3319	14	floor	st	ap	=L15.3319	
L16 3320		sand	sf	pa	=K15.3301=K16.3030=L15.3031	
K16 3321	10	pot	fn	ap		
K15 3322	3	rubble	ud	pa		
K15 3323	1	rubble	ud	pa		
K15 3324	3	rubble	ud	pa	=K16.3324	
K16 3324	3,7	rubble	ud	pa	=K15.3324=L16.3333	
K15 3325	1	sand	ud	pa		
K15 3326	9	rubble	ud	pa		
K15 3332	3	rubble	ud	pa	=K16.3332	
K16 3332	3	rubble	ud	pa	=K15.3332	
L16 3333	7	rubble	ud	pa	=K16.3324	
L16 3334	14	rubble	ud	pa	=L15.3068	
L16 3335	15,16	rubble	ud	pa	=K16.3034	
L16 3336	15	rubble	ud	pa		
L16 3337	15	pot	fn	ap		
K15 3338	3	rubble	ud	pa	=K16.3338=L16.3338	

House P46.33: the excavation

K16 3338	3	rubble	ud	pa	=K15.3338=L16.3338	
L16 3338	3	rubble	ud	pa	=K15.3338=K16.3338	
K15 3339	1	wall	st	ap		
K15 3340	1	wall	st	ap		
K15 3341	3	wall	st	ap		
K15 3342	3	wall	st	ap		door blocking
K15 3343	10	wall	st	ap		
L15 3344	12	niche	st	ap		
L15 3345	12	wall	st	ap		
L15 3346	11	wall	st	ap		
K15 3347	3	sand	ud	pa	=K16.3347	
K16 3347	3	sand	ud	pa	=K15.3347	
L15 3348	5	steps	st	ap		
K15 3349	3	rubble	ud	pa	=K16.3349=L16.3349	
K16 3349	3	rubble	ud	pa	=K15.3349=L16.3349	
L16 3349	3	rubble	ud	pa	=K15.3349=K16.3349	
K15 3684	2	rubble	ud	pa	=L15.3684	
L15 3684	2	rubble	ud	pa	=K15.3684	
K15 3685	1	rubble	ud	pa		
K15 3686	1	rubble	ud	pa		
K15 3687	1	wall	st	ap		
L15 3688	13	ash	ud	ap		fill of L15.3228
K16 3689	3	cut	st	ap		pot place ?
K15 3690	1,2	rubble	ud	pa	=L15.3690	
L15 3690	2	rubble	ud	pa	=K15.3690	
K16 3691	3	cut	st	ap	=L16.3691	pot place ?
L16 3691	3	cut	st	ap	=K16.3691	pot place ?
K16 3692	3	dais	st	ap		
K15 3693	3	floor	st	ap	=K16.3693=L15.3693=L16.3693	
K16 3693	3	floor	st	ap	=K15.3693=L15.3693=L16.3693	
L15 3693	3	floor	st	ap	=K15.3693=K16.3693=L16.3693	
L16 3693	3	floor	st	ap	=K15.3693=K16.3693=L15.3693	
K15 3694	3	hearth	st	ap		
K15 3695	3	dais	st	ap		
K15 3696	3	ash	ud	ap		hearth fill
K16 3700	3	cut	st	ap		pot place ?
K16 3701	3	pot place	st	ap		
K16 3702	3	pot place	st	ap		
K15 3703	1	rubble	ud	pa		
K16 3704	3	threshold	st	ap		
K15 3705	2	rubble	ud	pa	=L15.3705	
L15 3705	2	rubble	ud	pa	=K15.3705	
L16 3706	14	cut	st	ap		old oven place ?
L16 3707	15	rubble	ud	ap??		fill of pit
L16 3708	14	ash	ud	ap		
L16 3709	4	wall	st	ap		door blocking
K16 3747	6	floor	st	ap		
K15 3748		cleaning		exc		
K16 3749	7	rubble	ud	pa	=L16.3749	
L16 3749	7	rubble	ud	pa	=K16.3749	
K15 3750	3	pot place	st	ap		
L16 3751	14	rubble	ud	ap	=L15.3073	
L16 3752		cleaning		exc		
L16 3753	14	wall	st	ap		
L16 3754	15,16	rubble	ud	pa		
L16 3755	15	organic	fd	ap		

1987 excavation

L16 3756	15	floor	st	ap	
L16 3789	7	sand	ud	ap	
K16 3790	7	floor	st	ap	=L16.3790
L16 3790	7	floor	st	ap	=K16.3790
L16 3794	7	wall	st	ap	
L16 3795	7	threshold	st	ap	
K16 3796	3	threshold	st	ap	=L16.3796
L16 3796	3	threshold	st	ap	=K16.3796
L16 3797	7	floor	st	ap	
K16 3798	7	sand	ud	ap	=L16.3798
L16 3798	7	sand	ud	ap	=K16.3798
K16 3799	7	floor	st	ap	=L16.3799
L16 3799	7	floor	st	ap	=K16.3799
L16 3800	15	wall	st	ap	foundation batter
K15 3808	3	pot	fn	ap	hearth bowl
L16 3809	15	cut		ap	
L16 3810	16	floor	st	ap	
L16 3811	14	oven	fn	ap	
L16 3812	14	ash	ud	ap	fill of L16.3811
L16 3813	15	floor	st	ap	
L16 3814	15	cut		ap	
L16 3821	15	rubble	ud	pa	
L16 3822	15	ash	ud	ap	
K15 3871	1	pot place	st	ap	
K15 3878	1	floor	st	ap	
K15 3883	1	floor	st	ap	
K15 3884	3	threshold	st	ap	
K15 3885	1	threshold	st	ap	
K15 3886	1	jamb	st	ap	
L16 3887	15	midden	ud	ap	
L16 3888	15	floor	st	ap	
L16 3889	16	buttress	st	ap	
K15 3890	5	jamb	st	ap	
L16 3891	15	sand	ud	ap	
L16 3892	15	wall	st	ap	
L16 3893	14	midden	fd	ap	=L15.3189 ?
K16 3894	3	ash	ud	ap	fill of K16.3689
K15 3899	1	jamb	st	ap	
L16 3900	16	organic	fd	ap	
L16 3901		cleaning		exc	

Table 1.2. List of excavation units, arranged by area

Unit	Area	Char.	Type	Phase	Equivalences	Comments
K16 3030	00	sand	sf	pa	=K15.3301=L15.3031=L16.3320	
L15 3031	00	sand	sf	pa	=K15.3301=K16.3030=L16.3320	
K15 3099	00	desert		nat	=K16.3099=L15.3099=L16.3099	
K16 3099	00	desert		nat	=K15.3099=L15.3099=L16.3099	
L15 3099	00	desert		nat	=K15.3099=K16.3099=L16.3099	
L16 3099	00	desert		nat	=K15.3099=K16.3099=L15.3099	
K16 3175	00					cancelled
K15 3301	00	sand	sf	pa	=K16.3030=L15.3031=L16.3320	
L16 3320	00	sand	sf	pa	=K15.3301=K16.3030=L15.3031	
K15 3748	00	cleaning		exc		
L16 3752	00	cleaning		exc		
L16 3901	00	cleaning		exc		
K15 3323	1	rubble	ud	pa		
K15 3325	1	sand	ud	pa		
K15 3339	1	wall	st	ap		
K15 3340	1	wall	st	ap		
K15 3685	1	rubble	ud	pa		
K15 3686	1	rubble	ud	pa		
K15 3687	1	wall	st	ap		
K15 3690	1	rubble	ud	pa	=L15.3690	
K15 3703	1	rubble	ud	pa		
K15 3871	1	pot place	st	ap		
K15 3878	1	floor	st	ap		
K15 3883	1	floor	st	ap		
K15 3885	1	threshold	st	ap		
K15 3886	1	jamb	st	ap		
K15 3899	1	jamb	st	ap		
K15 3076	2	sand	ud	pa	=L15.3076	
L15 3076	2	sand	ud	pa	=K15.3076	
K15 3079	2	wall	st	ap	=L15.3079	
L15 3079	2	wall	st	ap	=K15.3079	
L15 3080	2	wall	st	ap	=L16.3080	
K15 3684	2	rubble	ud	pa	=L15.3684	
L15 3684	2	rubble	ud	pa	=K15.3684	
K15 3690	2	rubble	ud	pa	=L15.3690	
L15 3690	2	rubble	ud	pa	=K15.3690	
K15 3705	2	rubble	ud	pa	=L15.3705	
L15 3705	2	rubble	ud	pa	=K15.3705	
K15 3078	3	wall	st	ap	=L15.3078=L16.3078	
L15 3078	3	wall	st	ap	=K15.3078=L16.3078	
L16 3078	3	wall	st	ap	=K15.3078=L15.3078	
K16 3237	3	wall	st	ap		
K15 3238	3	wall	st	ap	=K16.3238	
K16 3238	3	wall	st	ap	=K15.3238	
L15 3306	3	jamb	st	ap		
K15 3322	3	rubble	ud	pa		
K15 3324	3	rubble	ud	pa	=K16.3324	
K16 3324	3	rubble	ud	pa	=K15.3324	

1987 excavation

K15 3332	3	rubble	ud	pa	=K16.3332	
K16 3332	3	rubble	ud	pa	=K15.3332	
K15 3338	3	rubble	ud	pa	=K16.3338=L16.3338	
K16 3338	3	rubble	ud	pa	=K15.3338=L16.3338	
L16 3338	3	rubble	ud	pa	=K15.3338=K16.3338	
K15 3341	3	wall	st	ap		
K15 3342	3	wall	st	ap		door blocking
K15 3347	3	sand	ud	pa	=K16.3347	
K16 3347	3	sand	ud	pa	=K15.3347	
K15 3349	3	rubble	ud	pa	=K16.3349=L16.3349	
K16 3349	3	rubble	ud	pa	=K15.3349=L16.3349	
L16 3349	3	rubble	ud	pa	=K15.3349=K16.3349	
K16 3689	3	cut	st	ap		pot place ?
K16 3691	3	cut	st	ap	=L16.3691	pot place ?
L16 3691	3	cut	st	ap	=K16.3691	pot place ?
K16 3692	3	dais	st	ap		
K15 3693	3	floor	st	ap	=K16.3693=L15.3693=L16.3693	
K16 3693	3	floor	st	ap	=K15.3693=L15.3693=L16.3693	
L15 3693	3	floor	st	ap	=K15.3693=K16.3693=L16.3693	
L16 3693	3	floor	st	ap	=K15.3693=K16.3693=L15.3693	
K15 3694	3	hearth	st	ap		
K15 3695	3	dais	st	ap		
K15 3696	3	ash	ud	ap		hearth fill
K16 3700	3	cut	st	ap		pot place ?
K16 3701	3	pot place	st	ap		
K16 3702	3	pot place	st	ap		
K16 3704	3	threshold	st	ap		
K15 3750	3	pot place	st	ap		
K16 3796	3	threshold	st	ap	=L16.3796	
L16 3796	3	threshold	st	ap	=K16.3796	
K15 3808	3	pot	fn	ap		hearth bowl
K15 3884	3	threshold	st	ap		
K16 3894	3	ash	ud	ap		fill of K16.3689
L15 3067	4	rubble	ud	pa		
L15 3075	4	rubble	ud	pa		
L15 3080	4	wall	st	ap	=L16.3080	
L15 3180	4	wall	st	ap		
L15 3239	4	rubble	ud	pa		
L15 3240	4	silt	ud	pa		
L15 3309	4	floor	st	ap		
L16 3709	4	wall	st	ap		door blocking
L15 3067	5	rubble	ud	pa		
K15 3077	5	steps	st	ap	=L15.3077	
L15 3077	5	steps	st	ap	=K15.3077	
L15 3080	5	wall	st	ap	=L16.3080	
L15 3348	5	steps	st	ap		
K15 3890	5	jamb	st	ap		
K16 3033	6	sand	ud	pa		
K16 3171	6	rubble	ud	pa		
K16 3178	6	sand	ud	pa		
K16 3183	6	floor	st	ap		
K16 3184	6	cleaning		exc		

House P46.33: the excavation

K16 3231	6	wall	st	ap	=L16.3231
K16 3235	6	wall	st	ap	
K16 3236	6	wall	st	ap	
K16 3747	6	floor	st	ap	
L16 3080	7	wall	st	ap	=L15.3080
L16 3231	7	wall	st	ap	=K16.3231
L16 3324	7	rubble	ud	pa	=L16.3333
L16 3333	7	rubble	ud	pa	=K16.3324
K16 3749	7	rubble	ud	pa	=L16.3749
L16 3749	7	rubble	ud	pa	=K16.3749
L16 3789	7	sand	ud	ap	
K16 3790	7	floor	st	ap	=L16.3790
L16 3790	7	floor	st	ap	=K16.3790
L16 3794	7	wall	st	ap	
L16 3795	7	threshold	st	ap	
L16 3797	7	floor	st	ap	
K16 3798	7	sand	ud	ap	=L16.3798
L16 3798	7	sand	ud	ap	=K16.3798
K16 3799	7	floor	st	ap	=L16.3799
L16 3799	7	floor	st	ap	=K16.3799
K15 3326	9	rubble	ud	pa	
K16 3032	10	rubble	ud	pa	
K16 3065	10	sand	ud	pa	
K16 3172	10	rubble	ud	pa	
K16 3179	10	rubble	ud	pa	
K16 3181	10	rubble	ud	pa	
K16 3182	10	floor	st	ap	
K16 3232	10	wall	st	ap	
K16 3321	10	pot	fn	ap	
K15 3343	10	wall	st	ap	
L15 3069	11	sand	ud	pa	
L15 3071	11	rubble	ud	pa	
L15 3185	11	rubble	ud	pa	
L15 3303	11	step	st	ap	
L15 3304	11	seat	fn	ap	
L15 3305	11	quern	fn	ap	
L15 3307	11	jamb	st	ap	
L15 3311	11	floor	st	ap	
L15 3316	11	floor	st	ap	
L15 3317	11	floor	st	ap	
L15 3346	11	wall	st	ap	
L15 3069	12	sand	ud	pa	
L15 3074	12	rubble	ud	pa	
L15 3081	12	jamb	st	ap	
L15 3229	12	rubble	ud	pa	
L15 3230	12	organic	fd	ap	
L15 3310	12	floor	st	ap	
L15 3314	12	floor	st	ap	
L15 3315	12	floor	st	ap	
L15 3344	12	niche	st	ap	
L15 3345	12	wall	st	ap	

object no. 8802
object no. 8800

1987 excavation

L15 3068	13	sand	ud	pa	=L16.3334	
L15 3072	13	rubble	ud	pa	=L15.3227	
L15 3097	13	wall	st	ap		
L15 3098	13	wall	st	ap		
L15 3177	13	step	st	ap		
L15 3186	13	rubble	ud	pa		
L15 3187	13	ash	ud	ap		fill of L15.3228
L15 3188	13	organic	fd	ap	=L15.3226	
L15 3226	13	organic	fd	ap	=L15.3188	
L15 3227	13	rubble	ud	pa	=L15.3072	
L15 3228	13	quem emp	st	ap		
L15 3302	13	quem emp	st	ap		
L15 3308	13	quem	fn	ap		
L15 3312	13	floor	st	ap		
L15 3318	13	floor	st	ap		
L15 3688	13	ash	ud	ap		fill of L15.3228
L15 3068	14	sand	ud	pa	=L16.3334	
L15 3073	14	rubble	ud	pa	=L16.3751	
L15 3189	14	organic	fd	ap		
L15 3313	14	floor	st	ap	=L16.3313	
L16 3313	14	floor	st	ap	=L15.3313	
L15 3319	14	floor	st	ap	=L16.3319	
L16 3319	14	floor	st	ap	=L15.3319	
L16 3334	14	rubble	ud	pa	=L15.3068	
L16 3706	14	cut	st	ap		old oven place ?
L16 3708	14	ash	ud	ap		
L16 3751	14	rubble	ud	ap	=L15.3073	
L16 3753	14	wall	st	ap		
L16 3811	14	oven	fn	ap		pot
L16 3812	14	ash	ud	ap		fill of L16.3811
L16 3893	14	midden	fd	ap		
L16 3335	15	rubble	ud	pa		
L16 3336	15	rubble	ud	pa		
L16 3337	15	pot	fn	ap		
L16 3707	15	rubble	ud	ap??		fill of pit
L16 3754	15	rubble	ud	pa		
L16 3755	15	organic	fd	ap	=?L16.3822	
L16 3756	15	floor	st	ap		
L16 3800	15	wall	st	ap		foundation batter
L16 3809	15	cut		ap		
L16 3813	15	floor	st	ap		
L16 3814	15	cut		ap		
L16 3821	15	rubble	ud	pa		
L16 3822	15	ash	ud	ap	=?L16.3755	
L16 3887	15	midden	ud	ap		
L16 3888	15	floor	st	ap		
L16 3891	15	sand	ud	ap		
L16 3892	15	wall	st	ap		
K16 3034	16	rubble	ud	pa	=L16.3335	
K16 3070	16	sand	ud	pa		
K16 3174	16	rubble	ud	pa		
K16 3234	16	wall	st	ap		
L16 3335	16	rubble	ud	pa	=K16.3034	

L16 3754	16	rubble	ud	pa
L16 3810	16	floor	st	ap
L16 3889	16	buttress	st	ap
L16 3900	16	organic	fd	ap
K16 3035	17	rubble	ud	pa
K16 3066	17	sand	ud	pa
K16 3173	17	rubble	ud	pa
K16 3233	17	wall	st	ap
K16 3066	18	sand	ud	pa
K16 3176	18	rubble	ud	pa

1.8 Appendix: report on a deposit of ferruginous material, from the doorway between areas 11 and 12 by Dr J.A. Charles, Department of Materials Science and Metallurgy, University of Cambridge.

One piece of two samples of dense, magnetic, ferruginous material submitted has been sectioned, polished, and examined metallographically. The microstructure consists of primary cored dendrites in a eutectic background, and qualitative laser microprobe mass-spectrometry (LAMMS) has indicated that the material is in the iron/arsenic/sulphur/antimony system, containing also copper, lead, and silver. In view of its structure the material cannot be a natural mineral but clearly originates from the solidification of a melt, probably over a temperature range of c. 1050 to 840°C, being identified by quantitative chemical analysis (Table 1.3) as a speiss/matte by-product associated with the smelting of lead, copper or copper-arsenic alloy. Although silver is present, the relatively low level (417 ppm) makes it unlikely that it was a waste product in the recovery of silver from lead. A review of the occurrence of speiss is included in a recent study by Kassianidou (1992).

%Fe	59.94	Comment: "LIMA indicated that the primary dendrites contained iron, nickel, copper, arsenic and oxygen. There was no oxygen in the interdendritic material which was much stronger in arsenic and copper. I imagine that the oxygen makes up much of the difference to 100% in the quantitative analysis."
%As	16.90	
%S	1.92	
%Pb	0.29	
%Cu	2.45	
%Sb	1.75	
%Ni	0.18	
Ag (g/tonne)	417.10	
Sn	0.18	
%Zn	0.06	
Total %	83.67 + Ag	

Table 1.3. Quantitative chemical analysis of the ferruginous material, by Anamet Services.

The material was clearly a waste product associated with a smelting operation. It is brittle and would not be of use in fabrication of tools, weapons, etc. A more detailed chemical analysis might help to establish association with possible ore sources and with the particular smelting activity involved. Since lead is incorporated, lead-isotope analysis might help in associating with ores and other products (e.g. bronze) from the same area or elsewhere.