

CHAPTER 2
REPORT ON THE 1987 EXCAVATIONS
HOUSE P46.33: THE FINDS

by
Andrew Boyce

2.1 Introduction

The small finds from house P46.33 were recovered partly by the trowel-men as they excavated, and partly at the sieves located at the dumps. The more important of them were noted by the site supervisor, Ann Bomann, in her site notebook; when they reached the expedition house all of them were recorded, with preliminary drawings where necessary, by the registrar for the season, Maire Brison. In preparing this report I have utilized their work, but have taken advantage of the fact that all of the material is in store at the expedition house, and have, in every case, examined the original objects, making my own notes and drawings. All of the drawings which appear in this chapter are, in fact, my own.

This is the first time that a full report on all of the small finds from a complete building or area has been attempted for the current excavations at Amarna. A complete and detailed descriptive catalogue is obviously the first requirement, but I have taken the opportunity so presented to add observations and notes of interpretation, and also to discuss the distribution of the finds and the light that this casts on some of the activities carried out by the people who lived in the house during the Amarna Period. The distribution is the basic horizontal spread of finds across the house, but, as is discussed in Chapter 4, the spread also extends vertically through the fill.

The chapter has three basic divisions. The first is a summary of the finds listed according to the places in which they were found, by room and unit number. The greater part of the chapter is then taken up by more detailed descriptions and notes on the material, treated category by category in the form of a catalogue. In it each class of object has a general introduction including, where possible, notes on both comparative material and the use(s) to which the artefact might have been put. Individual written entries follow this. Where the material was considered to be repetitive and no written description necessary it has been presented as a table. Particular attention has been paid to the faience from house P46.33, as it was felt that this was a rare opportunity to study faience in context from one of the smaller manufacturing areas located within the city. The bulk of the tables have been placed at the rear of the catalogue; they are referred to in the text by means of their number.

2.2 The finds listed by room and unit

ROOM 1

Unit [3325]

8866	Poppy seed head. Necklace pendant, faience.
8867	Bead FC2, faience
8976	Cornflower. Collar pendant, faience.

Unit [3685]

9158	Tile fragment, faience.
9159	?Vessel fragment, glass.

Unit [3685]

8801	Table fragment, stone.
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ROOM 1 (continued)

Unit [3686]

- 8979 Cylinder beads. Collar pendant, faience.
 8980 Bead RB9, faience.
 8982 Rod, glass.

Unit [3703]

- 8973 ?Vessel base, faience.
 8974 Unidentified fragment, faience.
 8975 Bull-head votive, faience.
 8977 a, b Beads FS1, faience.
 8978 Bead RB12, faience.

ROOM 2

Unit [3076]

- 8840 Grinder, stone.

Unit [3684]

- 9030 Jar label, pottery.
 9032 ?Palmette fragment, faience.
 9033 Irregular shape, corroded metal.

ROOM 3

Unit [3324]

- 8730a Tile fragment, faience.
 8730b Inlaid tile fragment, faience.
 8731 Earring fragment, stone.
 8732 Earring fragment, faience.
 8734 Taweret. Necklace pendant, faience.
 8735 *Wedjat*-eye. Ring bezel, faience.
 8736 *Wedjat*-eye. Ring bezel, faience.
 8899 Vessel fragment, glass.
 8900 Bead. Ring-shaped, glass.

Unit [3332]

- 8723 ?Inlay, faience.
 8724 Irregular shape, corroded metal.
 8725 Bead S3, faience.
 8726 Tile fragment, faience.
 8727 Bead. Flattened sphere, glass.
 8981 Tile fragment, faience.
 9251 Disc, re-used potsherd.

Unit [3338]

- 8868 Bead L2, faience.
 8872 Stool fragment, stone

Unit [3349]

- 8859 a, b Ringshanks, faience.
 8895 Blade fragment, metal.
 8896 Vine leaf, faience.
 8897 *Wedjat*-eye. Ring bezel, faience.
 8898 Bead RB9, faience.

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ROOM 4

Unit [3067]

8259 Rubber, stone.
8269 Bezel mould, clay.

Unit [3239]

8586 Bead R4, faience.
8634 ?Furniture, stone.
8635 ?Furniture, stone.
8705 Hammer stone.

Unit [3240]

8578 ?Weight, stone.
8638 Rubber, stone.
8639 Rubber/hammer, stone.
8655 Scaraboid, steatite.
8656 Grapes, faience.
8657 Ringshank, faience.
8658 Bead. "Acacia seed", glass.

ROOM 5

-NIL-

ROOM 6

Unit [3033]

8529 Rod, glass.
8530 Drop necklace pendant, faience.

Unit [3171]

8614 a, b Beads DB1, faience.

Unit [3178]

8426 Jar bung, mud.
8427 Jar sealing, mud.

ROOM 7

Unit [3333]

9041 Palmette. Necklace pendant, faience.

Unit [3749]

9020 a-e Animal head. Necklace pendants, faience.
9021 *Neb-nefer-ankh*. Ring bezel, faience.
9022 Cornflower. Inlay, faience.
9023 *Wedjat-eye*. Ring bezel, faience.
9025 Bead. Cowroid, glass.
9026 Bead DB1, faience.
9173 Taweret. Necklace pendant, faience.

ROOM 8

-NIL-

ROOM 9

-NIL-

ROOM 10

Unit [3032]

- 8143 Unidentified pendant fragment, faience.
8531 *Wedjat*-eye. Ring bezel, faience.

Unit [3172]

- 8386 Tile fragment, faience.

Unit [3179]

- 8394 Bes. Necklace pendant, faience.
8395 Unidentified pendant fragment, faience.

Unit [3181]

- 8383 ?Flower design, faience.
8384 Bead ES1, faience.
8385 Ringshank, faience.

ROOM 11

Unit [3069]

- 8276 Rod, glass.
8277 a, b Beads FS1, faience.
8278 Cornflower. ?Inlay, faience.
8279 a-c Ringshanks, faience.
8280 Unknown design. Ring bezel, faience.
8281 a-d Beads DB1, faience.
8282 Tile fragment, faience.
8283 Bead R2, faience.
8284 a-d Beads R4, faience.
8284 e Bead DB1, faience.
8285 Bead, ring-shape, glass.
8286 Irregular shape, corroded metal.
8288 Bead S2, faience.
8289 Firing error 5 x R4 beads, faience.

Unit [3071]

- 8370 ?Grindstone
8430 Rubber, stone.
8439 Bolti-fish. Ring bezel, faience.
8440 Bead S3, faience.

Unit [3185]

- 8473 Lotus + buds. Ring bezel, faience.
8474 a *Wedjat*-eye. Ring bezel, faience.
8474 b Ringshank, faience.
8475 Poppy seed head. Necklace pendant, faience.
8476 Needle fragment, metal.
8477 a-h Beads R4, faience.
8478 Firing error 1 + 1/2 x R4 beads, faience.
8479 a Bead S3, faience.
8479 b, c Beads S2, faience.

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Room 11, unit [3185] (continued)

8479 d	Bead spacer, faience.
8480	Bead Cy5, faience.
8481 a, b	Beads DB1, faience.
8483	?Vessel fragment, glass.
8576	Unworked fragments, stone.

Unit [3304]

8802	Stool, stone.
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Unit [3305]

8800	Grindstone.
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ROOM 12

Unit [3229]

8339	Table (half with 8373), stone.
8371	Table fragment, stone.
8373	Table (half with 8339), stone.
8489	Block fragment, stone.
8510 a-c	Beads S2, faience.
8511 a-k	Beads FS1, faience.
8512 a-c	Beads Cy1, faience.
8513 a-e	Beads DB1, faience.
8514	Bead R1, faience.
8515	Bead Cy5, faience.
8516	Tile fragment, faience.
8517	Sheet fragment, metal.
8518	Bead PF2, faience.
8585	Hathor head. Necklace pendant, faience.
8617	Tile fragment, faience.
8959	Ringshank mould, clay.
8960	Ringshank mould, clay.

Unit [3230]

8349	Grapes, faience.
8396 a-f	Bead spacers, faience.
8397 a	Bead S3, faience.
8397 b-f	Beads S2, faience.
8408 a-n	Beads DB1, faience.
8409 a-i	Beads R1, faience.
8410 a	Bead Cy1, faience.
8410 b, c	Beads ES1, faience.
8411	Tile fragment, faience.
8412	Bead L2, faience.
8413	Bead PF2, faience.
8414	Bead Cy1, faience.
8416	Irregular shape, corroded metal.
8963	Ringshank mould, clay.

ROOM 13

Unit [3072]

8422	Rubber/hammer, stone.
8557	Earring fragment, stone.
8558	Bead drop-shape, glass.

ROOM 13, unit [3072] (continued)

8559 a, b Beads Cy1, faience.
8560 Bead DB1, faience.
8561 Sheet fragment, metal.

Unit [3186]

8423 Hammer, stone.

Unit [3188]

8519 Rubber/hammer, stone.
9219 Bead S2, faience.

Unit [3226]

8482 Tile fragment, faience.
8485 Firing error 2 x S1 beads, faience.
8486 Bead R4, faience.
8492 Grapes, faience.
8493 Irregular shape, corroded metal.
8494 Bead "Acacia seed", glass.
8495 Bead Cy5, faience.
8496 Bead ES1, faience.
8497 Poppy seed head. Necklace pendant, faience.

Unit [3227]

8450 Comflower. Collar pendant, faience.
8451 Bead Cy4, faience.
8452 a-f Beads R4, faience.
8453 Firing error 1 + 1/2 x R4 beads, faience.
8454 Bead ES1, faience.
8455 Bead Cy5, faience.
8456 Wedjat-eye. Ring bezel, faience.

ROOM 14

Unit [3068]

8270 Bead ES3, faience.
8271 Bead spacer, faience.
8272 Bead R4, faience.

Unit [3073]

5472 Vessel base, stone.
8526 Strip, glass.

Unit [3189]

8536 Cowroid, steatite.
9691 Bead, ring-shaped, glass.
9692 Firing error 4 + 1/2 x R4 beads, faience.

Unit [3334]

9078 a, b Irregular shapes, corroded metal.
9079 ?Rosette. Inlay piece, faience.
9081 Tile fragment, faience.

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ROOM 14 (continued)

Unit [3708]

- 9176 Earring fragment, faience.
9217 Bead S2, faience.

Unit [3751]

- 9063 Irregular shape, corroded metal.
9069 a b Tile fragments, faience.
9070 a Bead R1, faience.
9070 b Bead R6, faience.
9072 *Wedjat-eye*. Ring bezel, faience.
9073 Irregular shape, corroded metal.
9074 b Bead S2, faience.
9074 a, c Beads S3, faience.
9075 Bead. Extended sphere, glass.
9076 Bead S3, faience.
9077 Firing error 3 x R4 beads, faience.

Unit [3893]

- 9146 Bead S2, faience.
9147 Firing error 2 x R4 beads, faience.
9148 Ringshank, faience.
9149 Bead Cy5, faience.
9579 Bead S2, faience.

ROOM 15

Unit [3335]

- 9027 *Wedjat-eye*. Ring bezel, faience.
9028 Tile fragment, faience.
9029 Rod, glass.

Unit [3336]

- 9033 ?Vessel fragment, glass.

Unit [3707]

- 9180 Disc, re-used potsherd.

Unit [3755]

- 9135 Bead spacer bar, faience.
9136 a, b Beads DB1, faience.
9137 Ringshank, faience.

ROOM 16

Unit [3754]

- 9138 a-d Beads S2, faience.
9139 Firing error 3 x R4 beads, faience.
9140 Bead R3, faience.
9141 Bead spacer, faience.
9142 Grapes. Collar pendant, faience.

Unit [3900]

- 9145 a, b ?Moulds, clay.
9146 Pierced disc fragment, stone.
9177 Bead S2, faience.

ROOM 17

Unit [3066]

8290 Unidentified pendant fragment, faience.
8291 Bead Cyl, faience.

Pieces found during cleaning/surface finds
(listed by square)

L15

[3031] Surface

8090 a, b Ringshank, faience.
8091 Bead DB1, faience.
8258 ?Whetstone.

L16

[3220] Surface

8616 Taweret. Necklace pendant, faience.
8618 Bell-head votive, faience.

[3752] Cleaning

9064 Bead C3, faience.
9065 Rod, glass
9066 Bead R1, faience.

[3901] Cleaning

9150 *Wedjat-eye*. Ring bezel, faience.
9151 Ringshank, faience.
9152 Firing error 1 + 1/4 x R4 beads, faience.
9175 Palmette. Ring bezel, faience.

K15

[3301] Surface

8579 ?Bead, stone.
8581 Ringshank, faience.
8582 a, b Bead DB1, faience.
8637 ?Baboon statuette, stone.

[3748] Cleaning

9042 Tile fragment, faience.
9043 Bead S2, faience.

K16

[3030] Surface

8053 Ringshank, faience.
8054 Tile fragment, faience.
8205 Relief fragment/whetstone.

[3301] Surface

8580 *Wedjat-eye*. Ring bezel, faience.

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2.3 Evidence for faience manufacture

(No objects were present in unlisted rooms)

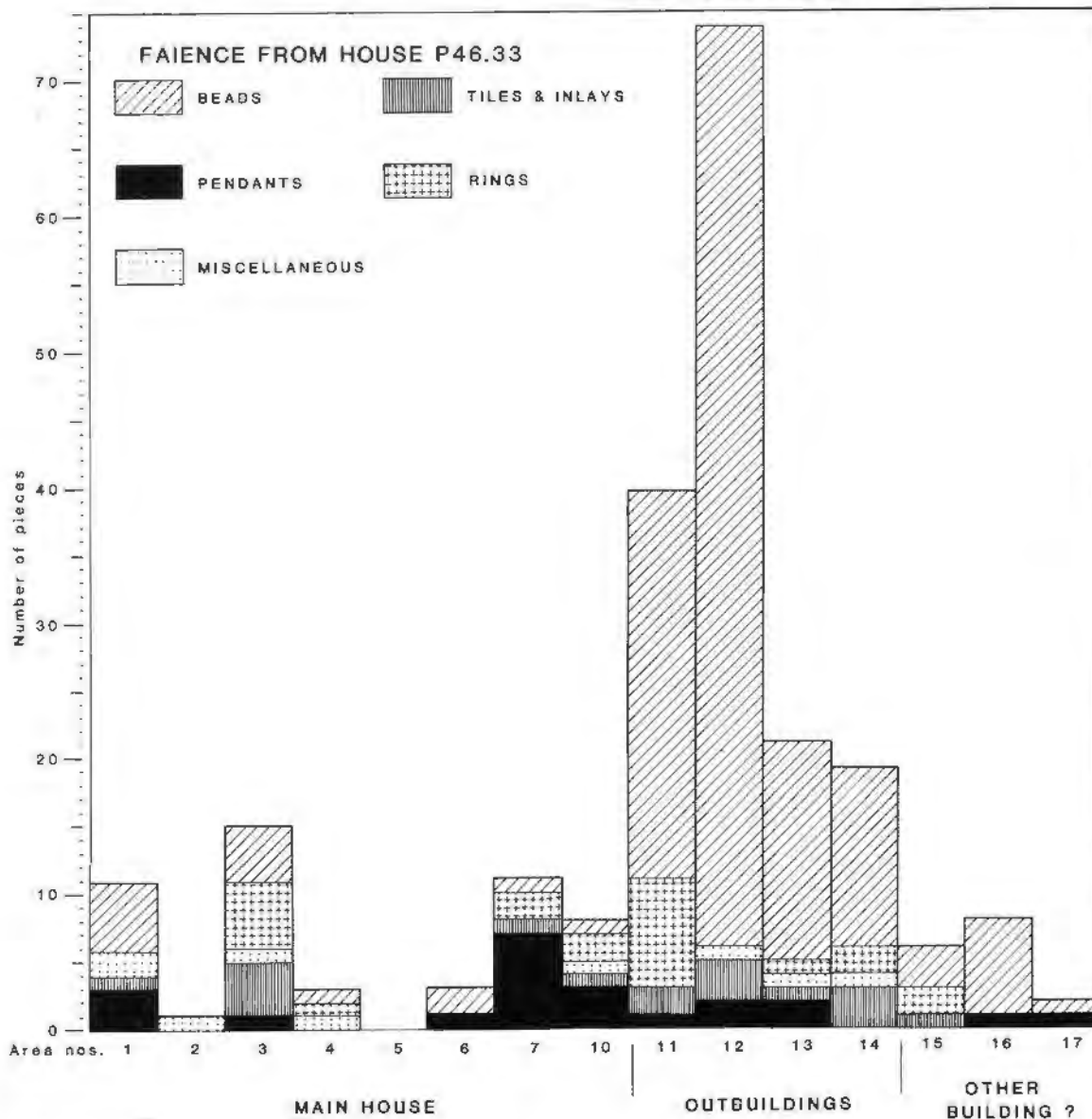


Figure 2.1. Faience objects found in P46.33, divided according to general type.

As is generally the case at Amarna, faience objects were numerous (Figure 2.1). They included four clay moulds for the production of faience, and a number of firing errors, all of them beads which have fused together (Figure 2.3). In addition, an unusually large number of objects have distinctive marks acquired during the glazing and firing processes. The majority of such pieces come from rooms 11–14, probably outbuildings or courtyards attached to house P46.33 (Figure 2.2). While much of the material found in this area could have come from a communal rubbish dump (and therefore not directly attributable to house P46.33), the material does show that faience was being manufactured in the vicinity. Two faience moulds and one firing error were also found in room 16 of the site. This may indicate a separate manufacturing area, although three pieces do not really amount to sufficient evidence to warrant further speculation.

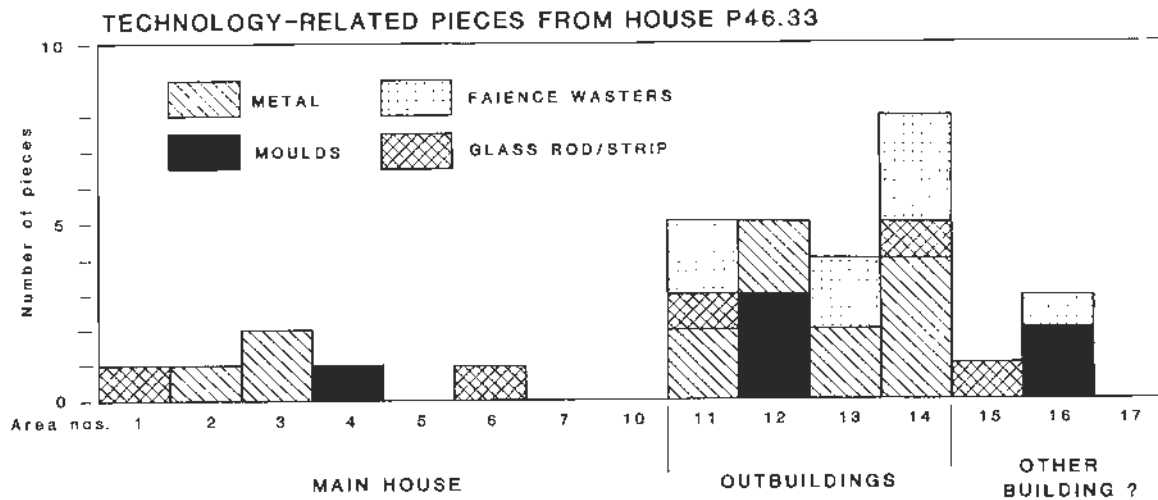


Figure 2.2. Objects relating to faience and glass manufacture in P46.33.

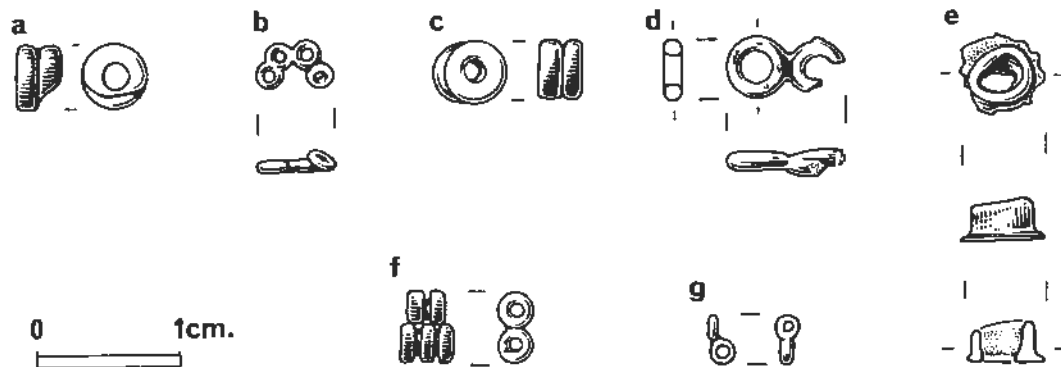


Figure 2.3. Manufacturing errors found in P46.33. Scale 2:1. (a) 8287. Segmented bead type S2, one section partly lost before firing; (b) 8289. Group of ring beads of type R4; (c) 8397a. Two ring beads of type R3; (d) 8478. Two ring beads of type R1. Note the sand grains attached to one side; (e) 8451. Cylinder bead of type Cyl. One end has flattened and is a dark brown colour, as though burnt. The inner wall is unglazed; (f) 8485. Two segmented beads of type S3; (g) 9147. Two ring beads of type R4 attached at 90° to one another.

Several related industries may also have been located nearby. Metal production is indicated by the presence of industrial waste (p. 43), while glass rods and artefacts show that glass was being used, if not manufactured, locally. Both glass and lead could be added to the faience body material to increase its strength (Kaczmarczyk and Hedges 1983: 215; Vandiver in *ibid.*: A108). Metal and glass industries have been found together in the ancient world and may, it has been suggested, have been the products of a single workshop (Kaczmarczyk and Hedges 1983: 241; Peltenberg in Bimson and Freestone 1987: 20). It seems equally possible that the same workshop could also have manufactured faience. Thirteen pieces of bronze or copper were also found in the area. These may not represent artefacts used by the occupant of the house, the presence of metal working, or trade goods. It is possible that they were accumulated as bronze scrap for producing copper-blue glazes (Kaczmarczyk and Hedges 1983: 250).

As stated earlier, a large proportion of the faience pieces from rooms 11–14 have marks, or flaws from the manufacturing process (Table 2.6). It can thus be argued that this represents discarded material, and that the outlying rooms (or an area nearby) were used for the dumping of rubbish. Only in a few cases, however, is it possible to state with any certainty that objects were

discarded as unusable (e.g. bead 8414, Figure 2.4b, where the central channel is blocked). We do not know the criteria used by an ancient Egyptian craftsman to judge whether an item of jewellery was suitable for use. A number of discrete groups of objects found in rooms 11–12, which comprise three ringshank moulds (8959, 8960, and 8963) and near identical groups of beads, could represent objects all discarded at the same time (e.g. a broken length of necklace) or pieces stored for use in a manufacturing area.

In reaching any conclusion on the use to which rooms 11–14 were put, much depends upon the interpretation given to the small kiln or oven found in room 14. A similar structure was found in Q48.4 (*AR V*: 33–7) which was apparently also in the vicinity of a faience manufacturing area. There appears to be no direct evidence at present, however, to link either of these structures with the production of faience.

2.4 Manufacturing processes

With the exception of piece 8723 (which has a dark red-coloured core), the faience from house P46.33 is of the type classified by Lucas as “ordinary faience” (Lucas and Harris 1962: 157; Kaczmarczyk and Hedges 1983: 185–99), that is, without a deliberately coloured body material. Where the body material has been exposed, it has (except where noted) discoloured brown due to burial conditions. Vandiver (in Bimson and Freestone 1987: 83) comments on apparently similar discolouration, that it was due to “iron staining the surface and discolouration from the accumulation of clay and dirt in the porous areas of the body”.

Both hard-bodied faience, where glass or lead were added to the body, and the more traditional softer material occur at the site. As Vandiver (in Kaczmarczyk and Hedges 1983: A109) points out, the more friable traditional material was used for tiles and inlays, where the thickness of the body material and attachment to a wall would provide additional strength.

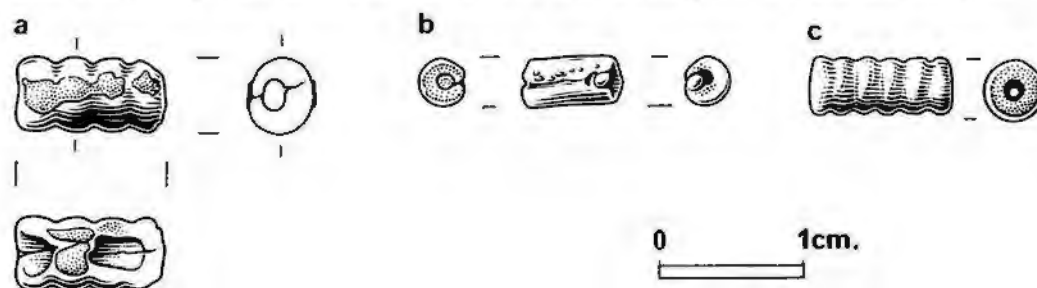


Figure 2.4. Beads showing evidence of the shaping process. Stippling indicates unglazed surface areas. Scale 2:1. (a) 8397a. Segmented bead of type S3, showing incomplete join of the body material on one side. Unglazed body material is attached to the glaze; (b) 8414. Cylinder bead of type Cy1. The central channel is blocked and there are grains of sand around the area where the body material joins; (c) 9074c. Segmented bead of type S3. One end is unglazed, suggesting it was cut from a length of shaped body material after the application of a glaze.

The majority of pieces were formed by moulding. Only simple beads and tiles seem to have been shaped by hand. In some cases beads seem to have been formed by wrapping the body material around a wire (see Vandiver, in Kaczmarczyk and Hedges 1983: A112) and cutting the tube formed by this process into short lengths to form beads. Two beads show where the edges of strips of body material were joined (8397a and 8414, Figure 2.4a, b), and a number of beads have unglazed ends where they were cut (8414 and 9074c; Figure 2.4b, c).

2.5 Glazing and firing

While no detailed analysis of glazing methods was undertaken at the site, it is possible to make certain general observations concerning them. A number of pieces from house P46.33 have a slightly coloured core, where the body material appears to contain traces of the surface colour.

If this interpretation is correct, then it could suggest that the efflorescence glazing process was being used (although other explanations are possible for this phenomenon, see Vandiver, in Kaczmarczyk and Hedges 1983: A19). This method consists of mixing the components of the glaze with the body material. As the paste which has been formed of the body material dries, the glaze materials migrate to the surface of the body and are deposited as salts which form the glaze when fired (Vandiver, in Kaczmarczyk and Hedges 1983: A31–3). Residual elements of the glaze materials are left within the body material, and when fired they form particles of glass (Tite, Freestone, and Bimson 1983: 21).

Another characteristic of effloresced glazes is the uneven thickness of the glaze. This happens if there is an uneven amount of evaporation from the body material, where, for example, a piece may rest on the ground, restricting evaporation and the accompanying formation of salts from one surface. This results in thinner areas of glaze (Vandiver, in Kaczmarczyk and Hedges 1983: A32, A39), a feature visible on pieces from area P46.33.

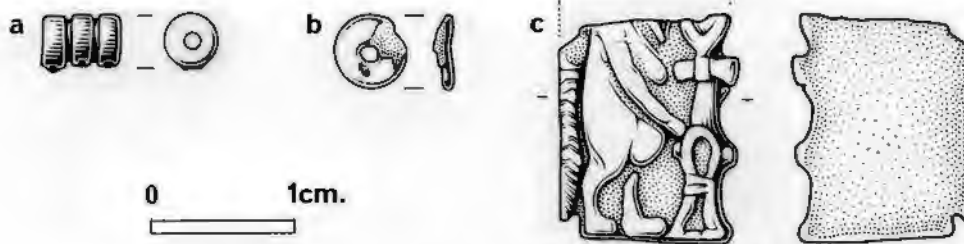


Figure 2.5. Faience from P46.33 showing typical marks left by the glazing and firing processes. Scale 2:1. (a) 8510a. Segmented bead of type S1. Along one side are "stick" marks possibly showing where it rested in the kiln; (b) 8582b. Disc bead of type DB1. One edge is misshapen and has unglazed body material attached; (c) 8616. Part of a Taweret pendant, showing rough areas in the outer face (stippled) and the unglazed area at the rear of the pendant.

Two faience moulds (9145a, b) were found with a thick coating of red powder in the mould recess. This is probably a residue from the body material which was impressed into the mould. The red colouring thus represents traces of the glaze components mixed with the body material. A number of faience moulds from the earlier excavations at Amarna have a similar red colouring, although, in general, the residue left in faience moulds is white. Faience with a red colour found at Amarna often has a distinctive red-coloured core and is of a type classified by Lucas as "variant C" (Lucas and Harris 1962: 162). It seems likely that the residue in moulds 9145a, b was from this type of faience.

The only evidence for other glazing methods employed at the site occurs on pieces where a secondary colour had been added (e.g. cornflower inlays 8278 and 9022). In such cases, additional glaze colours were probably painted on before firing.

A number of beads were fused together by their glaze during firing, in such a way as to suggest that they were fired close together, resting flat upon the kiln floor. This firing position appears to be confirmed by a segmented bead (8510a; Figure 2.5a) which is marked where the glaze apparently stuck to the kiln floor. Not all beads show marks from firing, and it may be that some were fired in a suspended position, possibly held by a wire (a faience bead held on a bronze wire found at Qantir is cited by Lucas and Harris 1962: 159).

Four additional features which appear to relate to the glazing and firing processes occur on the surface of faience objects from the excavated area:

1) Grains of sand or quartz in the glaze. These may be traces of fine sand used to separate pieces from the kiln floor during firing. Alternatively they may represent the accidental introduction of sand from the surrounding desert.

2) Unglazed body material attached to the surfaces of the glaze. This seems to have occurred after the glaze had been applied, either before or during firing. In some cases (e.g. bead 8397a;

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Figure 2.4a) the material is stuck to two opposite faces.

3) Rough areas in the glaze surface. Several pieces, particularly ring bezel 9021 and pendant 8616, appear to have an accumulation of fine brown sand in the recesses of their designs. Viewed using a x30 magnification lens, it can be seen that this sand covers rough areas in the glaze, and that the glaze coating is thin in these areas.

4) Glass forming over the glaze. Three ring bezels (8280, 8439, and 9175) have a thin coating of glass over certain areas of the glaze surface. This glass has formed mainly in the hollows of the bezel designs, where, to the naked eye, it appears as a slightly darker colour than the surrounding glaze. Two of the ring bezels (8280 and 9175) have a dark blue (presumed to be cobalt) glaze, where the overlying glass is a green colour, possibly derived from copper originally contained within the glaze.

In contrast to this material, faience from the Workmen's Village does not show such a high incidence of "technology-related" marks, and generally appears to be of a higher quality. The feature of unglazed body material adhering to the glazed surface appears unique (at present) to pieces from P46.33, and may indicate the distinctive products of a particular workshop. Twenty-one examples, mainly beads, were found, principally in rooms 11 and 12 (Table 2.1).

Room	No.
1	1
6	1
7	1
10	2
11	4
12	8
13	2
14	2

Table 2.1. The occurrence of faience objects with unglazed body material attached, listed by room.

2.6 Glaze colours

The most common glaze found on objects from P46.33 is a turquoise-blue colour, produced with the aid of copper (Kaczmarczyk and Hedges 1983: 149–50). The frequent occurrence of this traditional faience glaze (see Figure 2.6b) may show that it possessed a symbolic value as well as indicating the general availability of copper or bronze. The colours obtained using copper-blue glazes at P46.33 range from light turquoise to a mid-dark blue (Figure 2.6a). There appears to have been no concentration on any one shade, or any attempt to use particular shades for specific types of object. Blue glazes were also produced by the addition of cobalt, resulting in a darker blue or indigo colour. This glaze can generally be distinguished visually from copper-blue glazes. Thus, although it was not possible to analyse the chemical composition of the glazes present at the site, glazes could be provisionally identified as cobalt-blue after visual comparison with pieces preserved in the Ashmolean Museum, Oxford, which have been positively identified as cobalt-blue glazes by analysis in the laboratory (Kaczmarczyk and Hedges 1983: Appendix C: C33–C37).

In recording glaze colours from the site, a Pantone Colour Selector, produced by the Letraset company, has been used. This information has been inserted as a 3-figure reference after the written description of the glaze colour. Where no exact match was possible, the two nearest colours are quoted. At the rear of the catalogue of finds, tables have been included listing the main glaze colours, giving Pantone references and Munsell chart equivalents where available (Tables 2.7–9).

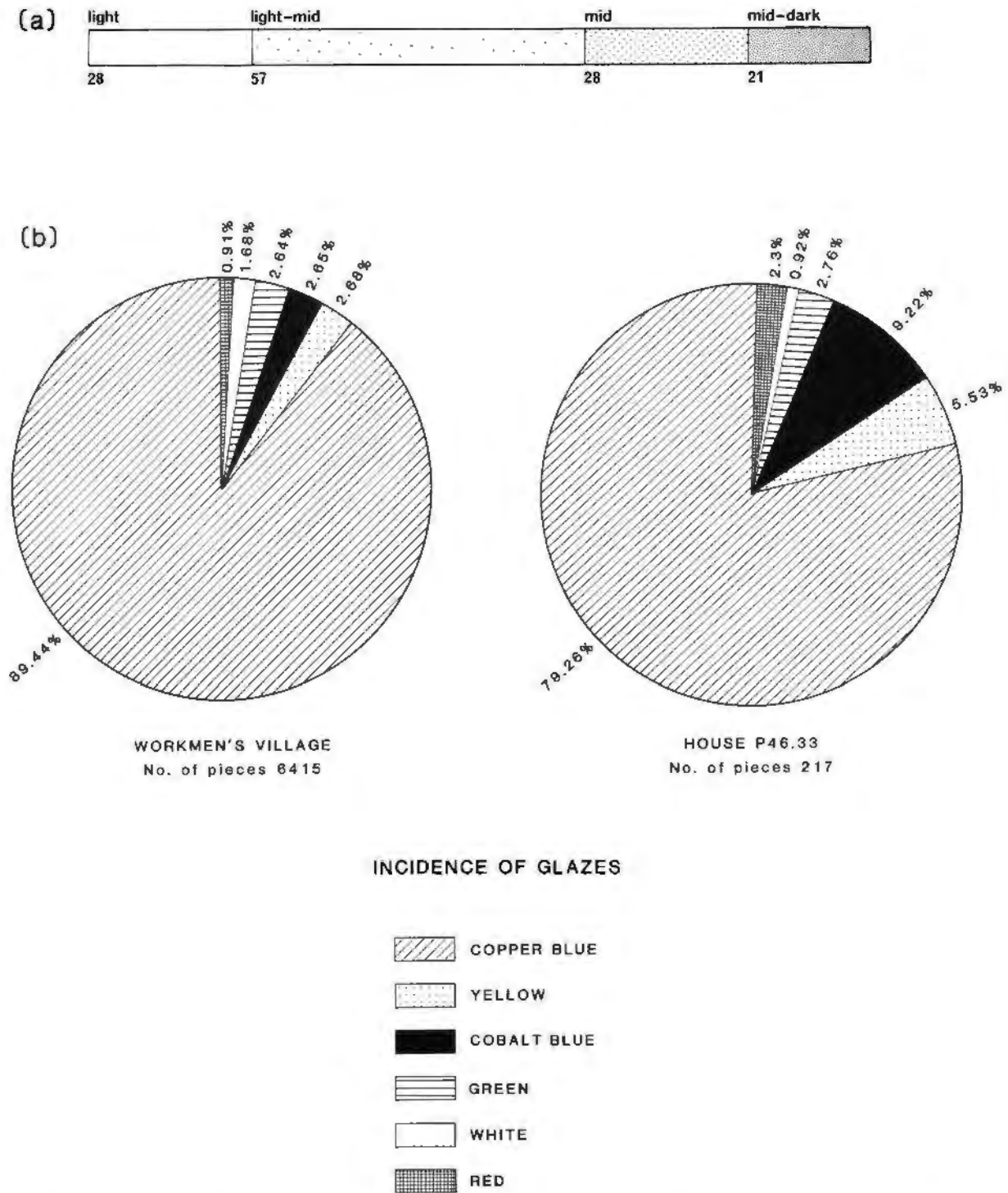


Figure 2.6. (a) Diagram showing the colour variation of copper-blue glazes found at house P46.33; numbers are nos. of examples; (b) The proportions of coloured glazes from the Workmen's Village and Main City site P46.33. This indicates only the glaze used over the whole body, not glaze colours used to add detail.

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Kaczmarczyk and Hedges (1983: 179) suggest that during the late Eighteenth Dynasty, 50% of blue faience objects used a cobalt-blue glaze over a part or the whole of the surface. This conclusion was presumably based upon a study of museum collections. The actual proportion of objects using cobalt-blue as an overall or secondary additional glaze which have been found during recent excavations at Amarna appears far lower, being 4.3% of blue glazes from the Workmen's Village excavations (this is a provisional figure only), and 8.1% from Main City site P46.33. The difference in results may be due to earlier excavators at Amarna discarding the majority of their copper-blue faience finds — probably beads, fragments of finger rings, and broken pendants.

Eighteen pieces from house P46.33 use a cobalt-blue glaze. In addition, a dark grey colour, also thought to have been produced using cobalt, occurs on the suspension beads of five pendants (9020a–e) from the site. The means by which a small workshop could have obtained the raw material for this glaze is not known. It may have been acquired from larger state-run manufacturing areas in the Central City.

As with recent Workmen's Village excavations, yellow glazes are comparatively rare at this site. They are found only on a group of five animal-head pendants (9020a–c) and eight beads. This colour was produced by the use of lead and antimony (Kaczmarczyk and Hedges 1983: 146–7). This combination was also used with copper to produce the characteristic pea-green colour (Kaczmarczyk and Hedges 1983: 148) frequently found on cornflower inlays and pendants (e.g. nos. 8450, 8976, and 8278). Antimony may have been in short supply at some time, as one cornflower inlay from house P46.33 (9022) has a copper-green glaze instead of the usual lead antimonate-copper mix.

There is one definite example of a white glaze from this site, on a fragment of a penannular carring (8732). This is actually a transparent glaze over a carefully prepared core of finely ground white quartz (Kaczmarczyk and Hedges 1983: 145). Such a piece would have needed careful preparation and been far more time-consuming to produce than pieces produced with a coloured glaze. This may account for its scarcity at the site.

The least common coloured glaze at the site is reddish-brown, produced using iron as the principal colouring agent (Kaczmarczyk and Hedges 1983: 167–8). This glaze also appears rare at the Workmen's Village and Main City site Q48.4.

2.7 Faience moulds

Six faience moulds were found in the excavated area of house P46.33 (Figure 2.7). They are of the pattern common during the Eighteenth–Nineteenth Dynasties, consisting of a fired clay oval with a design impressed into one face. The six moulds all contain a residue of faience body material indicating use. Three of the moulds (8959, 8960, and 8963) were all found in close proximity (room 12) with a fourth in a nearby room (room 4). Despite the differences in the design of the three ringshank moulds, they may all originate from the same workshop. If used simultaneously, a form of “mass production” of faience rings could have taken place.

8959	Faience mould for a ringshank
Material:	Fired Nile silt
Dimensions:	L = 41.75 mm W = 40.5 mm Th = 17.25 mm
Provenance:	L15 [3229] (room 12)

Clay mould with a horseshoe-shaped recess in the upper face. On the underside is the impression of a palm-print. The centre section, between the ringshank mould arms, is slightly recessed and had been marked with a short line while the clay was still wet (see AR V: Figures 8.2, 8.4 for similar marks). A shallow groove extends away from the lower part of the mould recess, probably the impression left by a cord (see notes on object 8960).

8960	Faience mould for a ringshank
Material:	Fired Nile silt
Dimensions:	L = 43.5 mm W = 44 mm Th = 17.5 mm
Provenance:	L15 [3229] (room 12)

1987 excavation

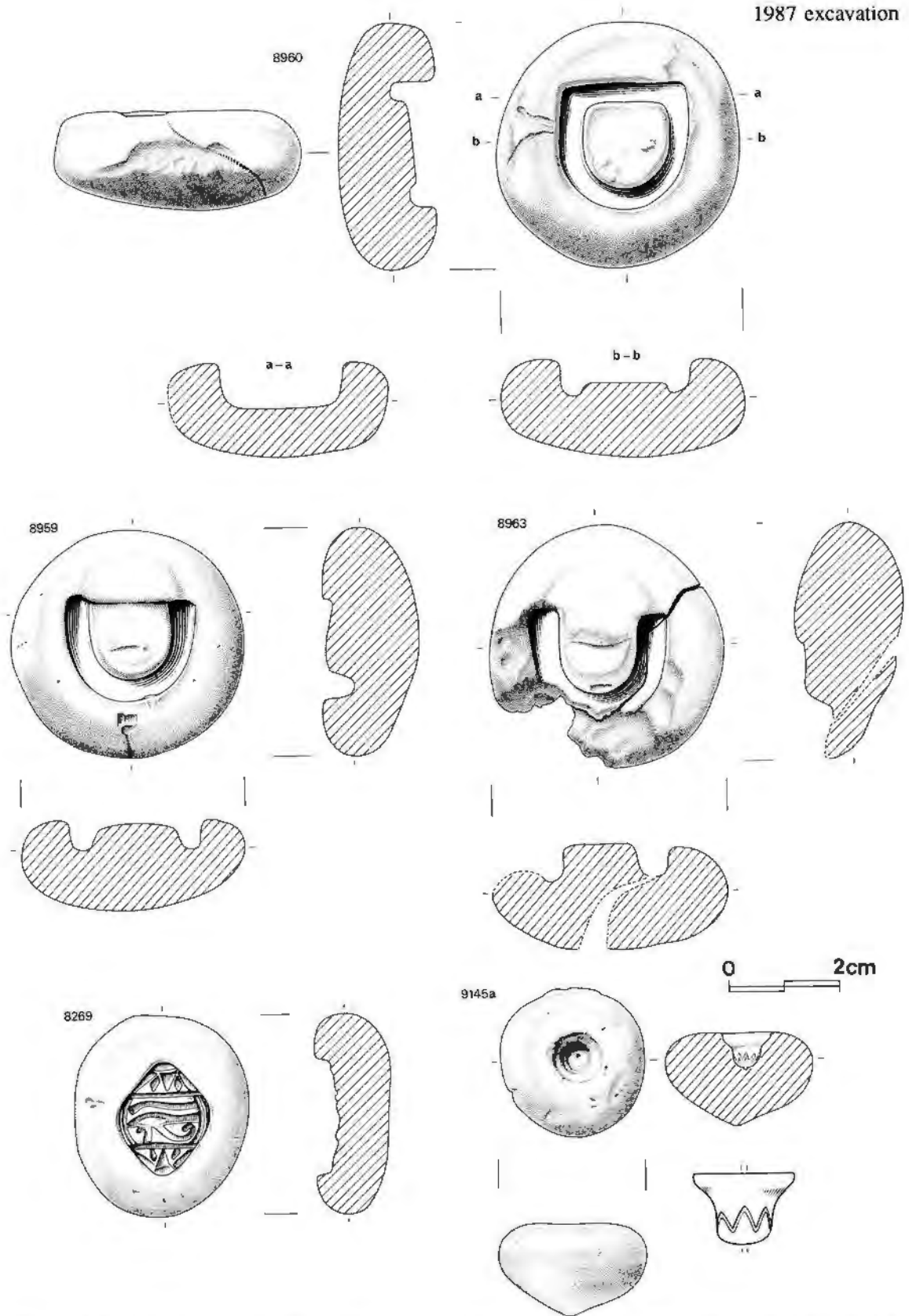


Figure 2.7. Faience moulds from house P46.33. Scale 1:1. A detail of mould 9145a is given at twice size.

House P46.33: the finds

Clay mould bearing the impression of a complete ring in the upper surface. From the left side of this impression is the imprint left by a thin cord, which runs down the side of the mould and crosses the base. This impression was identified by W. Wendrich as that left by a z-spun S-plyed cord, probably made of flax, the most common form of string at this time.

Cord impressions are quite common on faience moulds at Amarna. They usually begin at the edge of the mould-recess and lead across the upper face. As this impression was made while the clay was wet, it seems to be a result of some process used during the forming of the mould. It appears to represent a cord attached to whatever object was used as a "master" (in this case probably an actual ring) which was intended to assist in its removal from the clay while causing the minimum of damage to the impression (see discussion in Herrmann 1990: 20-1).

Like the mould of a complete ring published in *AR V*: Figure 8.2, this mould was probably used to produce just a ringshank.

8963 Faience mould for a ringshank
Material: Fired Nile silt
Dimensions: L = 41.75 mm W = 42 mm Th = 19.5 mm
Provenance: L15 [3230] (room 12)

Clay mould, broken into two parts, with the impression of a ringshank in the upper surface. Approximately one-third of the mould has been lost through damage. The central area between the arms of the ringshank mould is slightly recessed, in similar fashion to mould 8959.

The clay is a grey-brown colour, suggesting that it was not as well fired as moulds 8959 and 8960. The lower firing temperature, and consequent softer body material, may be the reason why this ringshank mould is more damaged than the other two examples found nearby.

8269 Faience mould for a ring bezel
Material: Fired Nile silt
Dimensions: L = 36 mm W = 31 mm Th = 13.5 mm
Provenance: L15 [3067] (room 4)

Mould of well-fired clay. Recessed in the upper face is a clear rectangular design, depicting a *Wedjat*-eye enclosed by four lines, with a stylised lotus flower (*Nymphaea caerulea*) at top and bottom. In section the recessed design is slightly convex. A small groove extending away from the design is almost certainly a cord impression (see notes on object 8960). Some of the hollows of the design have filled with a white residue of faience body material.

In common with other bezels depicting the *Wedjat*-eye, any positive produced by this mould would depict the right eye.

9145 a, b
Material: Fired ?Nile silt
Dimensions: a) Diameter = 25-6 mm Th = 15.25 mm (illustrated)
b) Diameter = 21-21.5 mm Th = 12.5 mm
Provenance: L16 [3900] (room 16)

Two clay moulds of similar pattern, found together. One (b) is slightly damaged. Both are roughly circular in outline, with flattened upper surfaces and each base tapering to a point. In the upper surface of each is a bell-shaped recess for moulding a faience bead. The recesses of both moulds are thickly coated with an orange-red powder (Pantone equivalent 166U) over which there is a thin residue of white faience body material.

The clay of both moulds is a red-brown colour. Where the surface is damaged the exposed body material has numerous limestone inclusions. The clay appears both lighter and harder than most faience moulds examined to date, and is probably a standard clay used in the manufacture of pottery (my thanks to P. Rose for this suggestion).

The mould design of both objects appears to be for a cone-shaped bead, with a raised six-pointed design around the apex, perhaps imitating a flower. In the bottom of each mould is a small circular recess, designed to help locate a wire or reed used to make the central channel.

Both mould designs are so similar that it seems likely they were produced using the same master or patris.

2.8 Faience pendants

The faience pendants from house P46.33 (Figure 2.10) can be divided into two main groups: necklace pendants, with one bead attached at the top for stringing, and collar pendants, with a second bead attached at the base. Where the pendant is incomplete, collar and necklace pendants can be distinguished by their design. At Amarna different designs were usually selected for collars and necklaces. Only one pendant falls outside these groups, pendant no. 8616. This is one of a small range of pendants which are larger in size than collar or necklace designs, and whose function is not certain.

Collar and necklace arrangements are described and illustrated in Chapter 11.

2.9 Collar pendants

Five pieces found during the excavation of house P46.33 are thought to be collar pendants. Four of these depict plant forms, of which two (8450 and 8976) could conceivably have been intended for the same row in a collar. The fifth pendant (8979) is constructed from three short cylinders in a row. These multiple cylinder pendants can be moulded (e.g. Petrie types 357–61) or assembled from separate pieces, as in this case. These multiple cylinder pendants resemble the form used as part of a *Wesekh*-collar, though statuary and sarcophagi of the late Eighteenth and Nineteenth Dynasties occasionally show a row of cylinder beads as part of an otherwise plant-form collar (Figure 2.8a).

While all the collar pendants from house P46.33 could have come from the same collar, there is no evidence to suggest this from their apparently haphazard distribution across the site. They may equally well have come from a manufacturing area and may never have been used in a length of jewellery.

2.11 Necklace pendants

Fourteen pendants with one suspension bead attached were identified amongst the excavated material. The majority of necklace designs which survive from Amarna suggest that a single form of pendant was used throughout a design. On this basis it is possible to isolate three small groups of pendants that may be connected. The most definite of these groups is five animal-head pendants (9020 a–e) found together in the same unit of room 7. These all appear to have been produced from the same mould, and glazed and assembled in a similar fashion.

Two Taweret pendants from adjacent rooms 7 and 3 (9173 and 8734 respectively) have a similar mid copper-blue glaze and may come from the same mould. A short length of a possible necklace with similar pendants was found in a burial at Tell Basta (El Sawi 1979: 14, Pl. 8, 10). The Middle Kingdom date assigned to these pieces is unlikely, as some of the pendants use a yellow glaze. This colour has not been positively identified prior to the late Eighteenth Dynasty (Kaczmarczyk and Hedges 1983: 246). The third group is two of the three ?poppy-seed head pendants found, which occur in the possible manufacturing area of rooms 11 and 12. These pieces could, however, just be the products of the same workshop.

2.11 Faience pendants

8143	Fragment. Unidentified.
Glaze:	Light copper-blue (no Pantone equivalent)
Dimensions:	L = 7.75 mm W = 9 mm Th = 3.25 mm
Provenance:	KI6 [3032] (room 10)

Part of a rounded design with the remains of a ring bead attached with slurry for suspension. The surviving outline suggests that this may be part of a date pendant. At Amarna date pendants

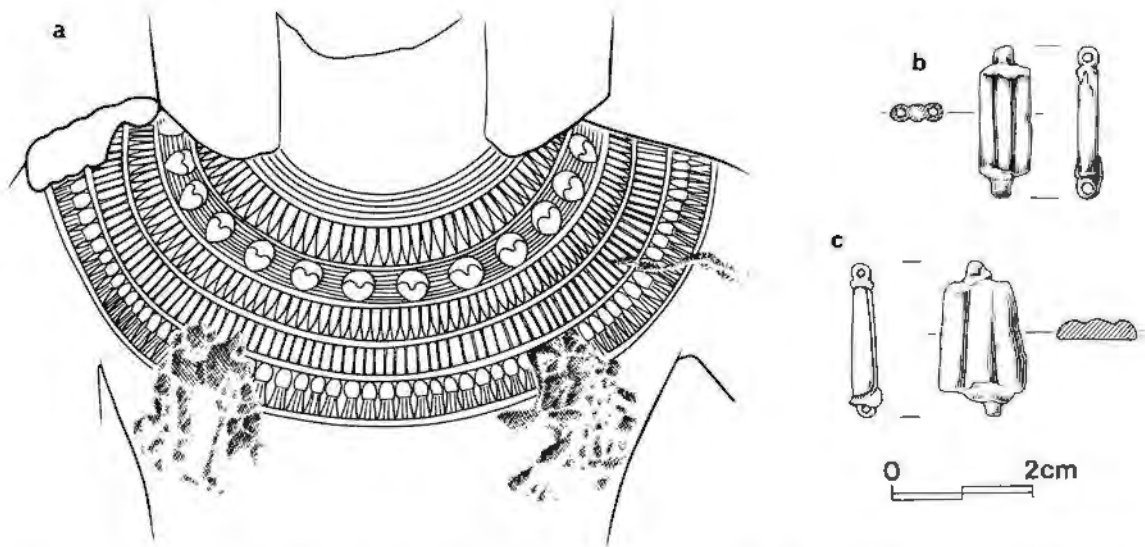


Figure 2.8. (a) Detail from a group statue of Horemheb from Abydos, displayed in the Cairo Museum (no. 6018) showing the king wearing a plant-form collar with a row of cylinder beads included. Also shown are (b) a complete multiple cylinder pendant made from separate cylinders, and (c) a similar one-piece moulded design [scale 1:1]. (b) is from earlier excavations at Amarna, British Museum no. 57975. (c) is drawn from an example preserved in the Museum of Archaeology and Anthropology, Cambridge. The piece is from the collections of P.E. Newberry and believed to come from Amarna. Both pendants are glazed light copper-blue.

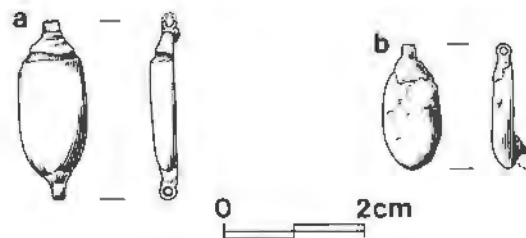


Figure 2.9. Comparison of (a) copper-blue and (b) polychrome date pendant designs. Scale 1:1. (a) is from the 1923-4 excavations at Amarna, no. 23/299. Drawn from the object preserved in the Bolton Museum, no. 30.24.12; (b) is from the recent Workmen's Village excavations, object no. 6216.

are usually found with two suspension beads attached, for use in a collar. Most of the date pendants found at Amarna use two different glaze colours, often a yellow upper part and a red-brown lower body (Figure 2.9). Such dichrome designs rarely use a light copper-blue glaze. When date pendants are glazed copper-blue they do not usually have any other glaze colour added. Such monochrome designs are not common at Amarna. They are part of a small range of copper-blue plant-form collar pendants which duplicate pendants usually found with polychrome designs. This range of pendants includes the mandrake, daisy, and comflower pendants, although probably not the palmette design, which is usually glazed copper-blue. Polychrome designs are usually detailed by the addition of different coloured glazes, while on monochrome designs such detail is usually indicated by recessed lines. While these recessed lines could have been scribed on to the pendant after moulding, a number of moulds survive which show that recessed lines could be part of the moulded pattern. It is possible that other specific moulds were made to produce monochrome



Figure 2.10. Faience pendants from house P46.33. Scale 1:1.

glaze pendants.

It is not clear why copper-blue and polychrome versions of the same design were made. Such copper-blue collar pendants at Amarna use a light-blue glaze, a colour which is not found in any surviving plant-form collar. Perhaps plant-form collars were made using only copper-blue pendants, although there is no definite evidence for this practice. It is possible that overall copper-blue glazes were used as collar pendants for a symbolic purpose, or for economic reasons, such as a limited supply of the other, less common glaze colours.

House P46.33: the finds

8290 Fragment. Unidentified.
Glaze: Copper-blue (no Pantone equivalent)
Dimensions: L = 5 mm W = 3 mm Th = 1.75 mm
Provenance: K16 [3066] (room 17)

Complete ring bead (R4) attached by slurry to a small area of pendant. Too little of the pendant survives to permit identification. Not illustrated.

8394. Necklace pendant. Bes. (Petrie type 288)
Glaze: Mid copper-blue 300U/process blue U
Dimensions: L = 15 mm W = 8 mm Th = 2.25 mm
Provenance: K16 [3179] (room 10)

Poorly detailed depiction of the god Bes, standing facing right, holding a tambourine. At the top, a cylinder bead (Cy1) has been attached with slurry. Areas of unglazed body material adhere to the front and rear faces of the pendant. To the right of the moulded shape a small area of glazed material projects out from the tambourine. This is not thought to be an intentional part of the design. It is possible that this pendant was discarded due to a lack of detail and the unglazed body material obscuring the design. This pendant was found together with pendant fragment 8395, though it is impossible to tell whether they were both of the same form.

Faience pendants of Bes are extremely common at Amarna. They appear to be intended for necklaces as all the pieces examined to date have only one bead attached.

8395 Pendant. Unidentified.
Glaze: Copper-blue (no Pantone equivalent)
Dimensions: L = 8 mm W = 5 mm Th = 2.5 mm
Provenance: K16 [3179] (room 10)

Complete ring bead (R4), attached by slurry to a small area of pendant. A large patch of unglazed body material adheres to the glaze surface. Too little of the pendant survives to permit identification. Not illustrated.

8450 Collar pendant. Cornflower (similar to Petrie type 486)
Glaze: Light green 383U
Dimensions: L = 10.5 mm W = 8.5 mm Th = 2.75 mm
Provenance: L15 [3227] (room 13)

Upper part of a cornflower pendant, with moulded lobes imitating the involucre of the flower (compare with inlay 8278). At the top of the design is the remains of a slurry used for attaching a suspension bead. This form is usually found at Amarna with two beads attached for use in a collar.

8475. Necklace pendant. ?Poppy seed head (Petrie type 473)
Glaze: { body + slurry rad-brown 484U
{ bead buff/white no equivalent
Dimensions: L = 12.25 mm W = 6 mm Th = 2.75 mm
Provenance: K15 [3185] (room 11)

Complete pendant, depicting a plant form. The central body is spherical, from which three lobes extend downwards. At the top there is a projection (possibly representing a stem) with a segmented bead (S1) attached.

This is one of three pendants (8475, 8497, and 8866) found at the site which depict this form. It is extremely common at Amarna, both at the Workmen's Village and Main City sites. While the pendant is usually of moulded faience at Amarna, it is often found at other sites in glass, stone, and gold (e.g. Brunton and Engelbach 1927: Pl. XLIII), particularly red-coloured stones such as camelian. The form seems to occur first during the early New Kingdom, almost

exclusively as a necklace pendant. It is commonly identified as a poppy seed head or cornflower, though it is occasionally also called a pomegranate or lotus seed head (*Nymphaea caerulea*).

The cornflower, pomegranate, and lotus seed head are all represented in Egyptian painting and relief with a similar shape which resembles this pendant, so that all these identifications are possible. The evidence to suggest that it may be the seed head of a plant is based on identifications of this pendant occurring in stone and metal. Stone examples of this pendant, which may have been introduced earlier than faience mouldings, simplify the "crown" so that it appears as a flat disc attached to the main body (e.g. Brunton and Engelbach 1927: 39–56). This form definitely resembles the seed head or capsule of the lotus flower or poppy. When this form is identified in Egyptological literature, it is most commonly called the seed head of the poppy, particularly the opium poppy (*Papaver somniferum*).

If this is a representation of a poppy seed head, it is curious that this does not seem to appear in Egyptian painting or relief of the period. The nearest parallel to the shape seems to be the Cypriot base-ring juglet found in Egypt at this time, thought, due to its resemblance to a poppy seed head, to have been used for the transport of opium (Merrillees 1962: 289). It has been suggested that these pendants were derived from the shape of the juglet rather than the actual seed head (Ibid.: 291). If this is the case, then it must be assumed that the Egyptians of the later Eighteenth Dynasty were also familiar with the actual seed head, as the form shown here depicts the crown as a series of "lobes" apparently representing the ribbed upper surface of the seed capsule. When this form is made in faience, it is usually glazed a light copper-blue. The use of this colour is not likely to be significant, as this is the most common colour used for necklace pendants. The poppy flower also occurs as a collar pendant at Amarna. This may depict the common com-poppy, *Papaver rhoeas* (Gabra 1956: 46).

8497 Necklace pendant. Poppy seed head. (Petrie type 473)
 Glaze: Yellow ochre 121U/128U
 Dimensions: L = 11.5 mm W = 6 mm Th = 3 mm
 Provenance: L15 [3226] (room 13)

Complete pendant. One of the lobes at the base of the design is missing, and at the right side of the design are three unglazed hollows — all due to poor moulding. At the top, a heavy application of slurry has been used to attach a ring bead for suspension. For notes on this form, see pendant 8475.

8530 Fragment Necklace pendant. Small "drop". (Petrie type 549)
 Glaze: Mid copper-blue 306U/Process blue U
 Dimensions: L = 13 mm W = 6.25 mm Th = 2.25 mm
 Provenance: K16 [3033] (room 6)

Lower part of a pendant in the shape of an elongated drop. The top, presumably with a suspension bead attached, is missing. Along one side of the pendant there is a ridge caused by body material overlapping the side of the mould when the impression was taken. The body material exposed by damage is a greenish-white colour. This form is normally found at Amarna with only one suspension bead attached. See Figure 11.1f and g, for its possible use as part of a necklace.

8585 Necklace pendant. Hathor head. (Petrie type 280)
 Glaze: Dark green-blue overall (?cobalt)
 Dimensions: L = 13 mm W = 8 mm Th = 3 mm
 Provenance: L15 [3229] (room 12)

Highly detailed moulding, depicting the head of the goddess Hathor. A cylinder bead (Cyl) has been attached to the top to permit suspension. At the top of the design is a cornice-shaped diadem, detailed with recessed lines. Below this, there are faint horizontal grooves on the wig, possibly imitating plaiting. The wig ends in curled side lappets, between which a series of short grooves represent a collar. The face is rendered schematically by several short lines. The left ear

House P46.33: the finds

is clearly moulded as a cow's ear, while the right ear is lost, possibly a detail which the impressed body material failed to reproduce. It is possible that a fine instrument was used to add detail to the design after moulding. This pendant is only known at Amarna with one suspension bead attached.

8616 Fragment. Pendant. Large Taweret (COA corpus type IV.A.7)
Glaze: Mid copper-blue 319U/320U
Dimensions: L = 16 mm W = 12.5 mm Th = 3.75 mm
Provenance: L16 [3220] (surface find)

Lower two-thirds of a depiction of the goddess Taweret shown with one leg forward and her right arm outstretched towards *Sa-* and *Ankh*-signs. The recessed parts of this design are pitted and rough, with a thinner glaze than the surrounding area. On the rear face, the glaze is present around the intact edges of the piece, but the central area is unglazed and has discoloured brown. This is an unusual feature, normally only found on larger tiles and inlays, where the rear face will not be visible when used. It may show that glazing took place using the efflorescence glazing process while the rear face was resting against a flat surface.

Pendants of similar size, usually showing either Taweret or Bes (for example Petrie type 290), are known from earlier excavations at Amarna. They have only one bead fixed at the top for stringing. No lengths of jewellery are known to survive showing how such larger pendants were worn. It seems possible that pendants of this size were worn individually, at the centre of a string of beads. Such an arrangement is suggested by a New Kingdom wooden figure of a servant girl, who has a necklace containing a single large pendant of Bes painted around her neck (Romano, in Brovarski, Doll, and Freed 1982: 230–31, no. 350; Aldred 1951: 94–5, Pls. 160–1).

8734 Necklace pendant. Taweret (similar to Petrie type 299)
Glaze: Mid copper-blue Process blue U
Dimensions: L = 14 mm W = 6.5 mm Th = 2.5 mm
Provenance: K15 [3324] (room 3)

Pendant, complete apart from a broken suspension bead, depicting the goddess Taweret standing, facing right, right arm extended. Little detail is visible, only the general outline and the raised arm can be identified. The lower part of the pendant is complete, though appears to lack part of the feet, which presumably were lost during the moulding process. This piece may be from the same mould as 9173. Both pieces use a similar glaze and may have been intended for the same necklace. See pendant 9173 for comments on this form.

8866 Necklace pendant. Poppy seed head (Petrie type 473)
Glaze: Mid-green (lead antimonate/copper) 362U/570U
Ring bead: mid-green 367U/368U
Dimensions: L = 12 mm W = 6 mm Th = 2.25 mm
Provenance: K15 [3325] (room 1)

Complete pendant. An uneven area at the right side of the pendant was caused by body material overflowing the side of the mould recess when the impression was taken. A segmented bead (S1) is attached to the top of the pendant for suspension. The glaze is matted and worn at the edges of the design.

See pendant 8475 for comments on this form.

8976 Fragment. ? Collar pendant. Cornflower (similar to Petrie type 486)
Glaze: Upper: Light-green 339U/326U
Lower: Dark cobalt-blue 280U
Dimensions: L = 5.25 mm W = 5 mm Th = 2.25 mm
Provenance: K15 [3325] (room 1)

Centre section of a cornflower pendant (or possibly inlay) preserving the division between involucre and petals. (See pendant 8450, inlay 8278). Not illustrated.

8979 Fragment. Collar pendant. Cylinder beads.
 Glaze: Light copper-blue 311U
 Dimensions: L = 18 mm W = 7.5 mm Th = 3 mm
 Provenance: K15 [3686] (room 1)

Incomplete pendant, probably two-thirds of the original length. Constructed from 3 cylinders attached in a row, with a suspension bead attached at one end. Unlike the other pendants illustrated here, this piece is not moulded. This type of pendant usually has a bead for stringing at both top and bottom, for use as a part of a collar (see Figure 2.8b, c).

9020 a-e Necklace pendant. Animal head. (?Jackal)
 Glaze: a - red-brown 484U
 b - yellow ochre 129U
 c - yellow ochre 129U
 d - yellow ochre 121U/129U
 e - yellow ochre 121U/129U
 All have a red-brown slurry (484U) attaching a dark grey cylinder
 bead (533U).
 Dimensions: a - L = 22 mm W = 9.75 mm Th = 4 mm
 b - L = 24.25 mm W = 10 mm Th = 4 mm
 c - L = 23 mm W = 9.5 mm Th = 3.75 mm
 d - L = 23 mm W = 9.75 mm Th = 3.5 mm
 e - L = 21 mm W = 10 mm Th = 3.5 mm
 Provenance: L16 [3749] (room 7)

Five complete pendants all depicting the head of a dog-like animal (Figure 2.11). The design shows an animal head with a long thin muzzle, slanted eyes and long pointed ears. Between the ears, a series of grooves appear to represent a collar. Measurement of details on all five pendants suggests (as does a purely visual inspection) that they all originate from the same mould. The use of two main glazes throughout, red-brown and yellow ochre, along with dark grey ring beads, suggests they were all produced together, perhaps for use in the same necklace. Individual details for each pendant are given below:

- a: Well-defined moulding, the clearest example of all 5 (illustrated).
- b: Cracks in the body material on the right ear.
- c: Badly defined moulding. Narrower suspension bead than other pendants.
- d: Well-defined details. Part of one ear missing (during moulding).
- e: Glaze cracked, muzzle lost (during moulding). Unglazed area at rear of body. Unglazed body material adheres to the glaze.

This animal head, with its characteristic frontal depiction, appears on ivory wands of the Middle Kingdom (e.g. Lacovara, in D'Auria, Lacovara, and Roehrig 1988: 127-8). During the New Kingdom it appears on various objects, most notably on casting sticks used in board games (Tait 1982: 33; Kendall, in Brovarski, Doll, and Freed 1982: 271-2). On the basis of its visual appearance (which shows some variation) Tait has suggested that both the jackal and a fox-like creature, the "fennec" (*Fennecus zerda*) are represented (Ibid.: 35). If we use the same criteria for making an identification (particularly the size of the ears related to the length of the muzzle), the depiction shown here seems more likely to be a jackal. Kendall (op. cit.) suggests, on the basis of textual evidence, that the animal is a jackal, probably representing one of a team of jackals responsible for towing the barque of the sun-god through the underworld during the night. A



Figure 2.11. The five animal-head pendants from house P46.33. Nos. 9020 a-e.

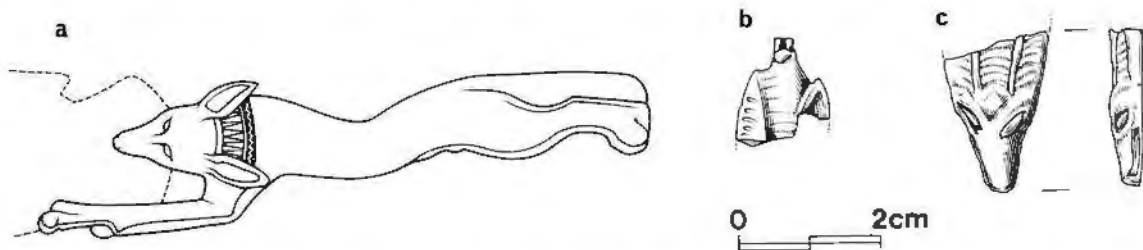


Figure 2.12. (a) Detail of a wooden ointment spoon, British Museum no. 5945, from Memphis, after Wilson 1986: Pl. 81; (b) Fragment excavated from house U36.28, no. 29/78. Ashmolean Museum no. 1929.410. Scale 1:1; (c) Fragment apparently from the 1930/31 season at Amarna. Drawn from the exhibit displayed in the Cairo Museum. Approximately actual size. Pendants (b) and (c) are both glazed light copper blue.

similar creature occurs on New Kingdom wooden ointment spoons (Figure 2.12a), where the body is shown in side view, but a frontal depiction of the head is used. Part of a spoon of this type was found in the remains of Building X1 during the 1979 excavations of the Workmen's Village at Amarna (Kemp 1980: Pl. I.3).

This appears to be the first recorded use of this head as a pendant, though several unprovenanced examples are displayed in the Ashmolean Museum, Oxford. At least two fragmentary pendants of similar design have, however, been found at Amarna. The first (Figure 2.12b), excavated in 1928/9, was published as part of a gaming piece (*COA* II: 19, no. 29/78, Pl. XXIX.1). The second is now displayed in the Cairo Museum, (R3 west) JdE 55525, amongst material labelled "Pendants from the 1930-1 season, Amarna" (Figure 2.12c). The pendant is illustrated in an unpublished excavation photograph from the 1930/31 season, but there is no other record of it in EES records for the season, and it must be considered a possibility that unidentified or fragmentary pendants were not always included in the written records or corpus (the *Journal d'entrée* entry adds no useful information).

9041 Necklace pendant. Palmette (Petrie type 380)
 Glaze: Mid copper-blue 307U
 Dimensions: L = 16.5 mm W = 11.5 mm Th = 2.25 mm
 Provenance: L16 [3333] (room 7)

Complete pendant, except for the suspension bead missing at the top. The design shows a palmette with two "streamers" attached to the leaves (or petals) at the base of the flower. The design is lopsided and concave in section. A ridge around the top of the design shows where the body material overfilled the mould recess when impressed.

The palmette appears to be primarily a New Kingdom motif, made by adding additional leaves or petals to the lily, or southern plant. In some cases, as shown here, the centre of the lily is replaced by these additional leaves. At Amarna, palmette pendants generally divide into two types according to size. The larger form (typically Petrie type 381) generally has two suspension beads, and the smaller form only one. In most cases palmette pendants are a light copper blue colour.

9142 Collar pendant. Bunch of grapes.
 Glaze: Dark copper-blue, heavily abraded
 Dimensions: L = 16.75 mm W = 7.25 mm Th = 3 mm
 Provenance: L16 [3754] (room 16)

Complete pendant depicting a bunch of grapes. Moulded spheres represent individual fruits. At the top, a cylinder bead (Cy1) has been attached for suspension. On the rear face there are the remains of a slurry used to attach a second bead. This form is usually provided with two suspension beads and has been found in a surviving complete collar at Amarna (*COA* II: 18, Pl. XXXVI.2).

9173 Necklace pendant. Taweret
 Glaze: Mid copper-blue Process blue U/307U
 Dimensions: L = 14.75 mm W = 6.5 mm Th = 2.75 mm
 Provenance: K16 [3790] (room 7)

Complete pendant, depicting the goddess Taweret standing, one leg forward, right arm extended. The pendant is summarily detailed possibly due to the consistency of the body material when impressed, rather than the design of the mould. Both the wig and crocodile-tail down the rear of the body are undetailed. On the snout, a small groove represents the open mouth. Below the snout, a raised area on the body represents a breast, with the right arm stretched out below this. A suspension bead has been attached at the top of the design.

The posture of this representation of Taweret suggests that it is intended to show the goddess as she appears in paintings, with one paw either clutching a knife or resting on a *Sa*-sign. Both small Taweret pendants, 8734 and 9173, may have come from the same mould and may have been intended for the same necklace.

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2.12. Faience rings

Six different ring bezel designs were found during the excavation of house P46.33 (Figure 2.13). All but two of the stratified ring fragments (9027 and 9137 from room 15) were found in the main rooms or adjoining buildings (rooms 11–14) of house P46.33. The main group of ring fragments occurs in room 11 which connects directly with room 12 where three ringshank moulds were found. It seems likely that faience rings were being manufactured in the vicinity.

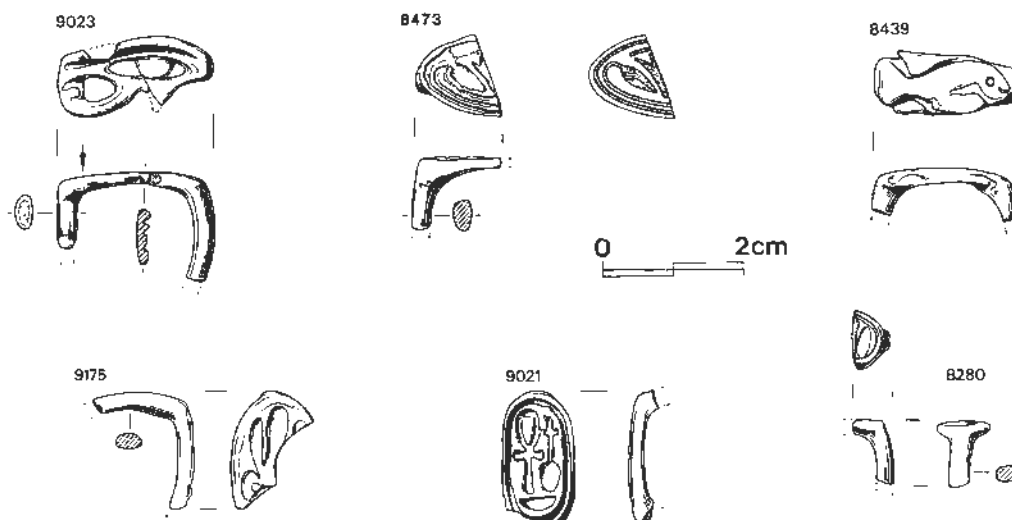


Figure 2.13. Faience ring fragments from area P46.33. Scale 1:1.

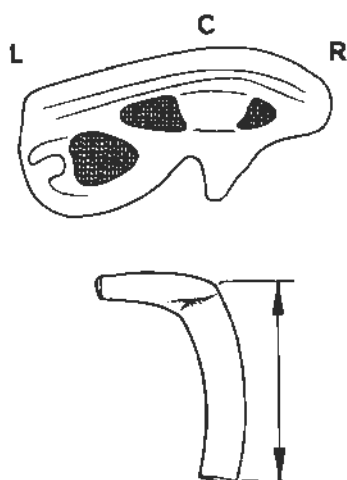


Figure 2.14. *Wedjat*-eye bezel fragments have been termed (L) left, (C) centre or (R) right to locate them within the design. The length of surviving ringshank given in the tables is measured as shown. The shaded areas of the design show the areas normally hollowed out after moulding.

Three fragments use a dark blue (presumed to be cobalt) glaze, the remainder are glazed copper-blue. All the rings described here were moulded in two halves (bezel and ringshank) which were assembled before firing (AR V: 161–2). Ringshank fragments have been listed separately (see Table 2.11).

Faience rings: bezel designs

8280	Fragment. Unknown design
Glaze:	Dark cobalt-blue 272U
Dimensions:	L = 5.5 mm W = 8.25 mm Th = 2 mm Shank length = 9 mm
Provenance:	L15 [3069] (room 11)

Small area of ring bezel with the remains of a ringshank attached. Too little of the bezel design survives to be identified. The design appears to be an oval hollow within the usual recessed outer border. The glaze on the ringshank and bezel appears to contain areas of a copper-blue colour. When examined using x30 magnification, it can be seen that olive-green coloured glass has formed over the dark blue glaze, collecting particularly in the recesses of the bezel design. Where the ringshank meets the bezel rear, the glaze has crazed (shown by stipple on the drawing). The proportions of this fragment seem to indicate that it is from the smaller type of faience ring, as documented in AR V: 161, Figure 8.1.

8439	Bolti-fish (Petrie type 195)
Glaze:	Light copper-blue 324U/325U areas of darker blue - process blue U
Dimensions:	L = 20.75 mm W = 9 mm Th = 2.25 mm Shank length(s) = 5 mm, 4.5 mm
Provenance:	L15 [3071] (room 11)

Complete bezel with the remains of two ringshank arms attached to the rear face. The design depicts a stylised Bolti-fish, one of the *Tilapia* species (Brewer and Friedman 1989: 77-9), with recessed detail. The glaze is light-blue overall, with areas of a darker colour creating a mottled effect. The glaze has begun to flake away from the bezel exposing a bluish-white core. The glaze coating the bezel is very thin, in contrast with the ringshank, where the glaze is up to 0.5 mm thick. This variation in thickness suggests that the ringshank and bezel were separately coated in glaze before assembly. The recessed areas of the design, particularly those depicting eye, mouth, and gills appear a darker colour than the rest of the body. This is due to a thin coating of mid-blue glass which has formed here. The rear of the bezel shows marks from trimming. Three different forms depicting the Bolti-fish in faience are known from Amarna. In each case they seem to be used for different purposes according to size. These are the small moulding (Petrie type 3.31) as a necklace pendant, the type illustrated here (Petrie type 195) as a ring bezel, and the larger form (Petrie type 330) which may be a votive piece. (It should be noted, however, that pendant-sized mouldings are sometimes used as a bezel for smaller rings.)

8473	Fragment. Lotus + buds (similar to Petrie type 217)
Glaze:	Dark copper-blue 300U/301U areas of light green - 325U/326U
Dimensions:	L = 12 mm W = 11.5 mm Th = 1.25 mm Shank length = 10 mm
Provenance:	L15 [3185] (room 11)

Part of a ring bezel, preserving approximately 50% of the design. The remains of a ringshank are attached at the rear. Despite distortions caused during manufacture, the recessed bezel design is recognisable as a central lotus flower (*Nymphaea caerulea*) flanked by two downward-pointing lotus buds, attached by their stems to the base of the flower. This floral motif is surrounded by an oval border which has merged with the top of the design (see supplementary drawing). On the underside of the bezel there is an unglazed area where it may have rested during glazing, and possibly also firing. A similar unglazed area on the surface of the ringshank may have been caused by handling, where the glaze was disturbed before firing. This bezel design is very common from both the Workmen's Village and earlier Main City excavations.

9021	<i>Neb-</i> with <i>Nefer-</i> and <i>Ankh-</i> signs (Petrie type 166)
Glaze:	Dark copper-blue process blue U
Dimensions:	L = 18 mm W = 10.25 mm Th = 2.25 mm
Provenance:	L16 [3749] (room 7)

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Oval bezel, with a small area of damage at the bottom of the design. At the bezel rear are marks from trimming, and the traces of a ringshank originally attached at top and bottom. The bezel design is recessed, showing *Nefer*- and *Ankh*-signs above a *Neb*-basket, surrounded by an oval border. In side view the bezel is convex. Rough areas in the glaze within the *Neb*- and *Nefer*-hieroglyphs (shown by stipple in the drawing) have discoloured brown, due to an accumulation of fine sand sticking to these surfaces.

9175	Fragment. Palmette (Petrie type 201)
Glaze:	Dark cobalt-blue (no Pantone equivalent)
Dimensions:	L = 16.5 mm W = 12 mm Th = 2.25 mm Shank length = 13 mm
Provenance:	L16 [3901] (cleaning)

Upper part of a bezel with the remains of a ringshank attached at the rear. The recessed design shows a group of upright leaves or petals, which extend from a lily design (now almost lost except at the lower left of the bezel). The design is a version of the composite plant form known as the "palmette" (see pendant 9042 for comments on this form). In side view the bezel is convex.

The dark blue glaze contains numerous copper-green areas, creating a "marbled" effect. This is due to a green glass which has formed over part of the surface (see the notes on bezel 8280 which has a similar glaze). The body material, exposed by relatively recent damage (as it has not discoloured) is a light purple-grey colour, also a feature of other dark blue-glazed material from Amarna. This may indicate that an efflorescence glazing process was used (Vandiver, in Kaczmarczyk and Hedges 1983: A19).

Wedjat-eye rings

The *Wedjat*-eye ring was the most commonly found bezel design at the recent Workmen's Village excavations. It is also the most common design from site P46.33. This may show both the popularity of the design and that the delicate shape was more prone to breakage than the solid oval form of ring bezel. All *Wedjat*-eye bezels from Amarna appear to depict the right eye. This may show the preference of the ancient Egyptians for writing from right to left, so that hieroglyphs are aligned to face, or oppose, the direction in which the text is read (suggestion by B. Kemp).

Thirteen fragments of *Wedjat*-eye rings were found in the excavated area. Only one example, 9033, had a complete bezel design.

Wedjat-eye bezels were generally detailed after moulding, mainly to hollow out certain areas, usually the "white" of the eye and, in some cases, areas within the "hawk eye" markings at the bottom of the design. As a result of this process, along with any trimming of the outline, it is difficult to tell whether any of these pieces originated from the same mould. Comparisons of the proportions of different pieces show only that more than one mould was used.

Bezel fragments of this design appear randomly scattered throughout house P46.33. There is only one possible grouping, from the central room of the house (room 3), nos. 8735, 8736 and 8897. Two of these pieces were found in the same unit, but it is not certain that they are from the same ring. A description of the only complete bezel is given below. It is typical of all the pieces found. In listing the other pieces found, the coding shown in Figure 2.14 has been used (see Table 2.10).

9023	<i>Wedjat</i> -eye bezel (Petrie type 176)
Glaze:	Mid copper-blue process blue U - 307U
Dimensions:	L = 12 mm W = 22 mm Th = 2 mm Shank length = 14.25 mm
Provenance:	L16 [3749] (room 7)

Bezel, broken into two halves, complete except for damage to the lower part of the design. At the rear are the remains of both arms of a ringshank. The areas around the pupil and eye markings have been hollowed out before firing. The glaze is a mid-turquoise colour overall, with small patches of a green colour. A diagonal break across the centre of the bezel shows that this area has completely vitrified, now resembling blue glass throughout. On the ringshank, the glaze

is between 0.3–0.5 mm thick (see supplementary drawing).

2.13. Penannular earrings

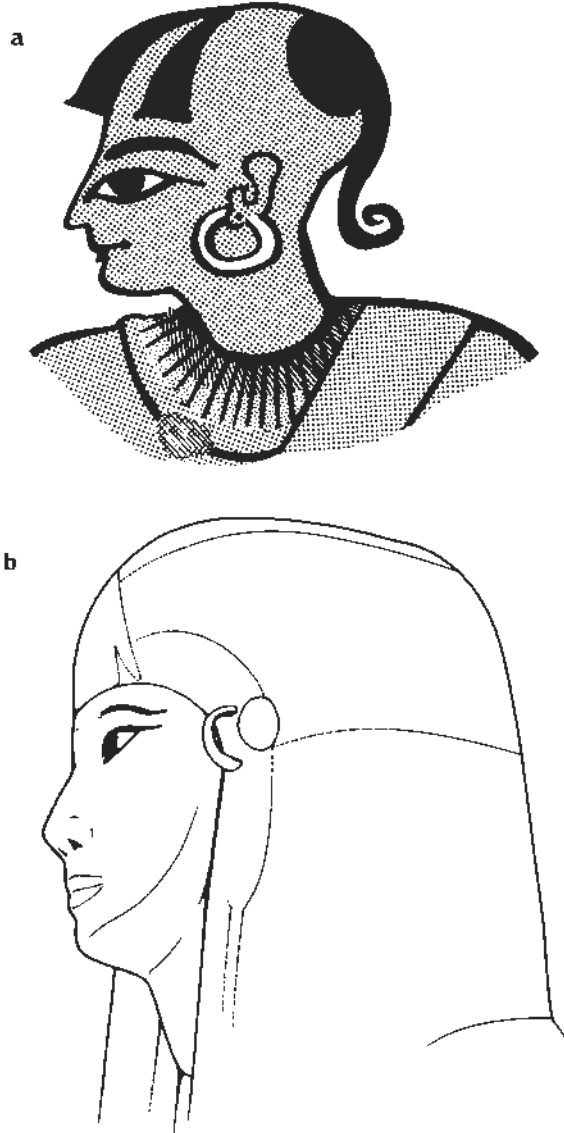


Figure 2.15. (a) child wearing a penannular earring. From the tomb of Inherkhau at Deir el-Medina (Theban tomb no. 359), British Museum 1291, after James 1985: Fig. 34; (b) detail of the sarcophagus of Isis, showing a representation of earrings being worn. Cairo Museum JdE 27309.

Four penannular earring fragments were found during the excavation of house P46.33 (Figure 2.16). This shape is the most common type of earring found at Amarna. During the recent Workmen's Village excavations penannular earrings were the most commonly found stone artefact, and they were also found regularly during previous Main City excavations, made in glass, faience, and stone. This form has been called a "hair ring" (see discussion in Petrie 1927: 22; and Brunton and Engelbach 1927: 16–17) due to the opening on some examples being too small to wear on the ear. It seems more likely, however, that such pieces were made specifically

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for funerary use, and not intended to be worn (Eaton Krauss, in Brovarski, Doll, and Freed 1982: 288, entry 290). There is no record of earrings with such a narrow opening being found at Amarna.

Depictions of Nubians wearing this form of earring are relatively common from the New Kingdom (e.g. Hayes 1959: 284, Fig. 172), but Egyptians are rarely shown wearing them. When Egyptians are shown wearing penannular earrings, they are often painted yellow, presumably showing they were of gold (Wilkinson 1971: 121–3). Several tomb paintings from Deir el-Medina do, however, show white-coloured (?stone) earrings being worn by both adults and children (Figure 2.15a). In addition, the sarcophagus of Isis, from the tomb of Sennedjem (Theban tomb no. 1), has two stone earring halves attached, as though partly covered by the side lappets of her wig (see Figure 2.15b)

While the frequent occurrence of stone earrings at the Workmen's Village could suggest that they were a relatively low-status item of jewellery, several stone penannular earrings occur in the funerary equipment of Tutankhamun (Murray and Nutall 1963: 18, entry 620 [47–9]).

Stone

8557	Fragment
Material:	Fine-grained, cream-coloured quartzite
Dimensions:	L = 27.25 mm Th = 6.75 mm x 6
Provenance:	L15 [3072] (room 13)

Part of a well-finished earring. Approximately half the original circumference survives, with one rounded original end. Roughly triangular in section. Estimated original diameter 29 mm.

8731	Fragment
Material:	Fine-grained, cream-coloured quartzite
Dimensions:	L = 20.5 mm Th = 5.5 mm x 4
Provenance:	K15 [3324] (room 3)

Part of an unevenly-shaped earring. Approximately half the original circumference survives with one rounded original end, which is narrower than the main body of the ring. Roughly triangular in section. Less well made than fragment 8557. Estimated original diameter 20.5 mm.

Faience

8732	Fragment
Glaze:	White
Dimensions:	L = 21.5 mm Th = 5.5 mm x 4
Provenance:	K15 [3324] (room 3)

Part of a moulded earring. Approximately half the original circumference survives, with one rounded original end. Roughly triangular in section. Estimated original diameter 22.5 mm. Small cracks are visible in the surface of the glaze of this piece. The body material exposed by damage is white, suggesting it was more carefully prepared than for coloured faience (see Kaczmarczyk and Hedges 1983: 145).

9176.	Fragment
Glaze:	Mid copper-blue 313U
Dimensions:	L = 21.5 mm Th = 4.5 mm x 5
Provenance:	L16 [3078] (room 14)

Part of a moulded earring. Approximately one quarter of the original circumference. Broken at both ends, triangular in section. No estimate of the original diameter is possible. The body material exposed by damage contains particles up to 0.25 mm in diameter. A small area of unglazed body material adheres to the glaze on one side of the fragment.

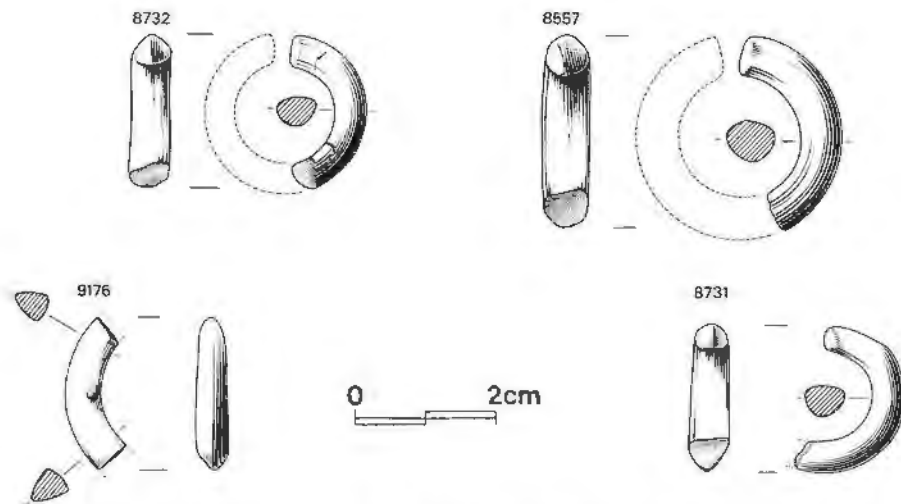


Figure 2.16. Earring fragments in stone and faience from area P46.33. Scale 1:1.

2.14 Faience beads

Faience beads are the most common class of object from house P46.33 (Figure 2.17). The majority were found in rooms 11–14, an area which contains material connected with the manufacture of faience, perhaps from a workshop located here, or a communal rubbish dump. The most common form is the disc bead, probably the simplest form to make, and the most widely used. There seems to be a relationship between the simplicity of shape (for example disc, sphere, and cylinder beads) and the numbers found. Certainly the more complex detailed (and probably moulded) shapes such as FC2, PF2, RB9, and RB12 are not common. It should be noted that the earlier excavators found clay moulds which they believed were for disc beads. It is not certain, however, that such simple shapes would have been moulded, and the moulds may actually have been for circular inlays such as sun-disc hieroglyphs.

With the exception of the disc beads and moulded pieces, all beads were probably shaped by hand on a length of wire or reed. The thin-walled cylinder and ring beads may have been formed by coating a stem or wire with a slurry of body material, which could be cut into short lengths when dry. Where beads show evidence of the manufacturing process, these have been described and illustrated in the introductory section on faience manufacture.

The terms used here (such as DBI, RI, R2, etc.) for faience beads are taken from a corpus devised using material from the Workmen's Village excavations. These terms were taken, or adapted, from those already in use at the site. This corpus will be published in the final report of the Workmen's Village excavations. In each of the following entries a written description of each form precedes any notes on the individual piece. Where beads may have originated from a particular jewellery design this is noted in the text. A table giving COA bead corpus designations for beads from house P46.33 is also given (Table 2.2). However, comparison with the material from earlier excavations in the Main City is difficult, as the corpus used in COA II and III appears to rely totally on shape, and mixes glass, stone, and faience beads without distinguishing them.

Several types of bead occur in large numbers from buildings published in the *City of Akhenaten* volumes, so that it is possible to suggest they formed the major part of a string of jewellery. As this may provide some indication of the use to which beads from area P46.33 were put, a list of some of the more significant groups is given here (Table 2.3). Such earlier records suggest that strings of beads were assembled from beads of similar design and size. This may not, however, present a complete picture of bead use at Amarna. Bead arrangements from the New Kingdom at Gurob (Brunton and Engelbach 1927: Pls. LIII, XLV) show a variety of shapes and

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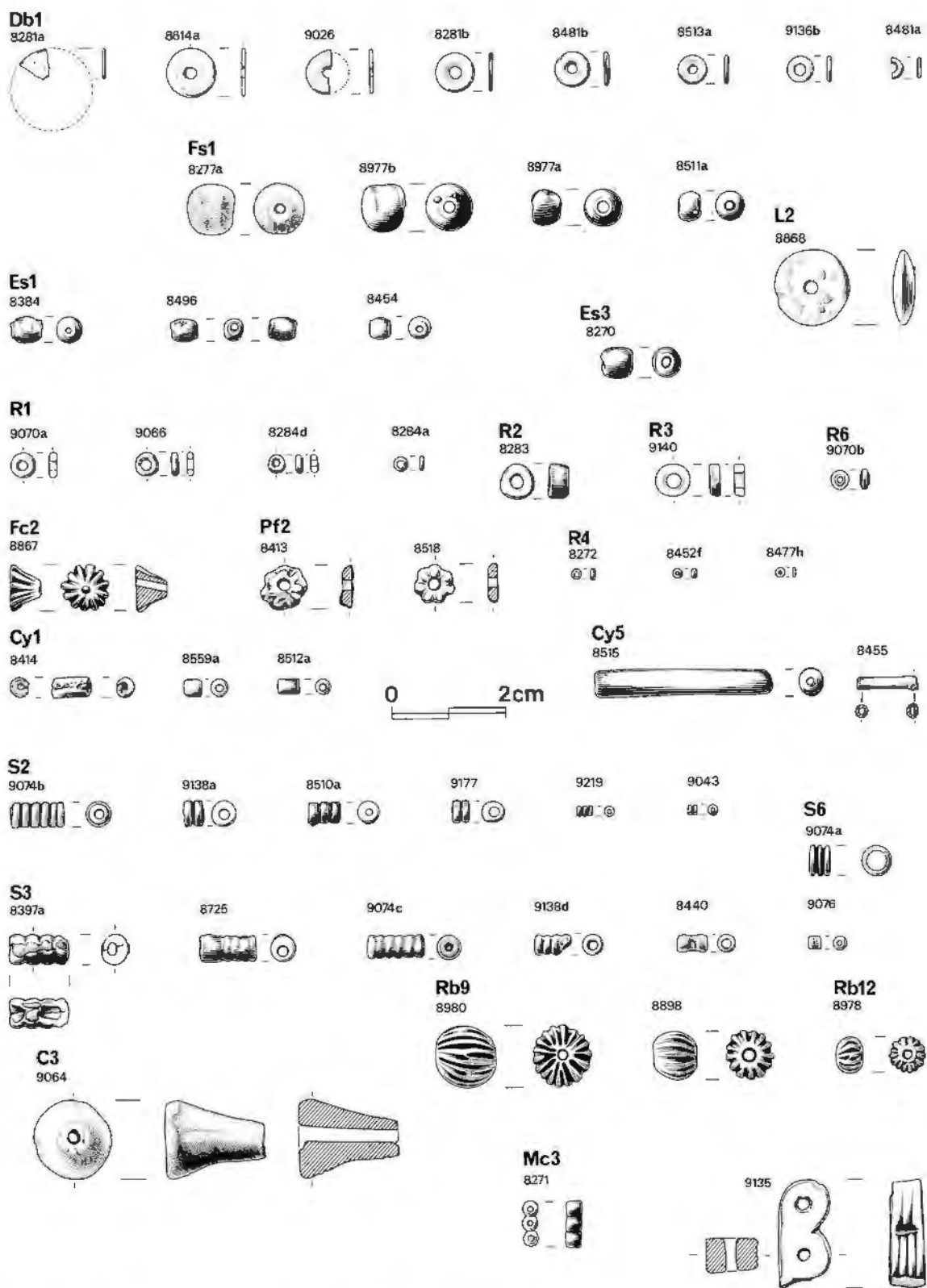


Figure 2.17. Faience beads from house P46.33. Scale 1:1.

Current terms		COA corpus numbers
Multiple bead spacer	MC3	XXXV
Disc bead	DB1	XXII
Ring bead	R1	? LXVIII
Ring bead	R2	? L/LIX
Ring bead	R3	No equivalent
Ring bead	R4	? XXXIII
Ring bead	R6	No equivalent
Cylinder bead	Cy1	? XLIII/LXII
Cylinder bead	Cy5	XXXII
Segmented bead	S1	? XIX/XXIV
Segmented bead	S3	? XIX/XXIV
Extended sphere bead	ES1	? X
Extended sphere bead	ES3	XXXVIII/XLIV
Flattened sphere bead	FS1	VIII
Ribbed bead	RB9	LI
Ribbed bead	RB12	? LVII/XIII
Lentoid bead	L2	XX
Cone bead	C3	? XXVI
Plant form bead	PF2	? IV
Floral cone bead	FC2	? V

Table 2.2. Beads found at house P46.33 and their *City of Akhenaten* bead-corpus equivalents.

sizes of bead on the same string. Unless found together, or on their original string, such arrangements are difficult to detect.

Beads of glass and stone have been included in this section, as records of surviving lengths of beads from Amarna (while badly documented) appear to show that beads of different materials could be used as part of the same arrangement. A similar practice is illustrated by finds from Gurob (Brunton and Engelbach: 1927: esp. Pls. LIII, XLV). For lists of beads see Tables 2.12–2.21.

Multiple bead spacers

At Amarna, this form was usually made by attaching three cylinder beads in a row. When used as part of a necklace, these spacers both connect and keep separate the strings of beads

House P46.33: the finds

Bead type	COA corpus no.	House	Number found
Disc bead DB1	XXII	T35.19	"many"
Disc Bead DB1	XXII	T35.23	"many"
Disc Bead DB1	XXII	Great Palace, Servant's Quarters	"over 100 found together"
Ring Bead R2	L	T35.3	16
Ring Bead R2	L	T35.23	"many"
Cylinder Bead Cy5*	XXXII	T34.1	16
Cylinder Bead Cy5	XXXII	T35.23	"many"
Flattened Sphere FS1**	VIII	S33.1	"many"

* It is possible that groups of cylinder beads represent the remains of a broad collar.

** This shape occurs in both glass and faience. It is not clear which material these beads were made from.

Table 2.3. Main bead groups from COA II and III.

comprising the necklace (it is likely that such pieces were also used as part of bracelets and anklets or other forms of jewellery). Spacer beads of any other pattern are not common at Amarna, suggesting that jewellery designs at this site may have achieved a high level of standardisation. At Gurob, ten different patterns of spacer beads are recorded from the Eighteenth–Nineteenth Dynasties (Brunton and Engelbach 1927: Pl. XLIII).

Nine virtually identical bead spacers of type MC3 were found in house P46.33, six of which (8396 a–f) were found together in one of the outbuildings (room 12) with a seventh nearby (8479 in room 11). This grouping may not indicate the remains of a necklace, rather that such forms were made nearby. Table 2.12 summarises the information on the multiple bead spacers.

9135	Fragment. Large spacer bar
Glaze:	Thin white glaze
Dimensions:	L = 18.75 mm W = 9 mm Th = 6.25 mm
Provenance:	L16 [3755] (room 15)

Part of a coarse-bodied spacer-bar, shaped on one side to resemble two half cylinders with horizontal ribbing, with the opposite face left plain. At the centre of each cylindrical outline a hole has been pierced. In side view the object can be seen to taper slightly. The nearest parallel to this shape appears to be the metal spacer-bars occurring in a faience bead "stole" (as Aldred termed it) from the tomb of Tutankhamun (Aldred 1971: Pl. 105, and p. 222). These metal bars taper and are scribed in a similar fashion to the faience spacer-bar shown here, presumably imitating small groups of disc beads. While no records of such jewellery arrangements are known at Amarna, a similar fragment of a large spacer bar was found at the site in 1930 (COA II: 61, no 30/320, also Pl. XLII.1, bottom row). Pendlebury identified this piece as part of a Mycenaean bead spacer (COA II: 100), though this identification is now considered to be unlikely.¹

¹ While this conclusion is my own, I have benefited from discussion with Dr Helen Hughes-Brock on the subject.

Disc beads (DB1)

This class includes disc beads of all sizes, with a square-cut or slightly rounded rim. Except in the case of errors made during manufacture, the main faces of the bead are flat. A total of thirty-five disc beads were found in the area of house P46.33. The majority are between 5–7.5 mm in diameter, and the average thickness is between 0.5–0.75 mm. Most of the disc beads were found in rooms 11 and 12. All use a copper-blue glaze. The details are summarised in Table 2.13.

Ring beads

Five different types of ring bead are recognised from the site, types R1, 2, 3, 4, and 6. Ring beads are similar to disc beads but with a thicker wall. Generally the wall thickness is less than half the diameter.

- R1 Both outer and inner profile (aperture) of bead rounded.
- R2 Outer edge and both faces slightly flattened.
- R3 Square in section, flatter outer edge than R2.
- R4 Small bead as used in collar/necklace strings. Approximately 2 mm in diameter. This bead is classified primarily by its small size.
- R6 Shape as for R3, but with a ridge around the threading aperture on both faces.

The most common patterns of ring beads are R1 (12 examples) and R4 (23 examples). In both cases the majority of beads come from areas 11–14. The details are given in Table 2.14.

Cylinder beads

Two cylinder bead types listed in the current corpus were found in the area of house P46.33, Cy1 and Cy5. Cylinder beads are of greater wall thickness (or length) than ring beads, this dimension generally measuring half or more of the diameter.

- Cy1 Circular in lateral section. Length approximately 1.5 times the diameter. Rounded ends.
- Cy5 Circular in lateral section. Long thin cylinder, length more than twice the diameter.

The majority of cylinder beads were found in rooms 11–13. A group of 16 blue cylinder beads (Cy1) of 7 mm in length were found during the 1926–7 season at Amama (currently unpublished, excavation no. 26–7/127 from house U37.1).

Details of cylinder beads are given in Table 2.15.

Segmented beads

Two different types of segmented bead were identified from house P46.33. Both have grooves running laterally across the surface, giving the segmented appearance to the bead. In all cases, segmented beads are classified by the shape of these segments, rather than by their number.

- S1 Clearly defined segments, evenly spaced.
- S3 Segments rounded in outline, the grooves creating the segments are less distinct than for S1.

Several deposits of segmented beads from house P46.33 contained both S1 and S3 and were possibly from, or intended for, the same length of jewellery, so that the division created here may not be one which the ancient craftsman would have recognised. Thirty segmented beads were

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found, of which 16 come from rooms 11–12. The only recognisable group outside this possible manufacturing area are four beads (9138 a–d) from room 16. This group varies between 3–6.25 mm in length and 3–4 mm in diameter. It is possible they come from a single string of jewellery.

The number of segments on excavated beads varies between 2–6. It can be seen from the accompanying table (2.4) that larger beads with more segments are less common than the smaller.

No. of Segments	Number found	Sizes between	
		L = length	D = diameter
2	13	L = 1.5 – 4	D = 1.75 – 4
3	8	L = 3 – 5.5	D = 2 – 5.25
4	5	L = 4.25 – 6.25	D = 1.75 – 5.5
6	2	L = 9.5 – 10	D = 3.75 – 4.5

Table 2.4. Segmented beads showing relationship between number of segments and size.

Twenty-four beads have “stick” marks along the side, suggesting the pieces were usually fired resting on the kiln floor.

Segmented beads appear to have been shaped to resemble a length of ring beads (type R4). As such they could be used in necklaces instead of individual beads. This practice is illustrated by the necklace shown in Figure 11.1a. Details of segmented beads are given in Table 2.16.

Extended sphere beads

Two types of extended sphere bead are recognised from house P46.33, types ES1 and ES3. Extended sphere beads are enlarged along their threading axis so that this dimension exceeds the diameter.

ES1 Bead shape extended so that its length exceeds its diameter by up to 1.5 times. There is a rim around each aperture which merges with the body.

ES3 Bead shape extended so that its length exceeds the diameter by up to 1.5 times. Unlike ES1 the bead ends are rounded.

All extended sphere beads were found in rooms J–L. They use both cobalt and copper-blue glazes. Details are given in Table 2.17.

Flattened sphere beads

Only one flattened sphere bead, type FS1, was found during the excavation. This form has flattened ends around the threading apertures. Its length is the same as, or slightly less than, its diameter. Fifteen beads of type FS1 were found. Thirteen of these come from rooms 11 and 12. The remaining two (8977 a–b), which may be from a string of beads, come from room 1. A group of eleven beads found together (8511 a–k) in room 12 average 4 mm in diameter and 3.75 mm in length. This relative degree of standardisation might show that they were intended for, or part of, the same piece of jewellery. Details are given in Table 2.18.

Ribbed beads

Three ribbed beads were found, of types RB9 and RB12.

RB9 Spherical bead with a series of grooves running between the two openings, creating a ribbed effect (Petrie type 349).

RB12 As RB9, except the ends are flattened so that it is oval in outline.

Two beads (8980 and 8978) of types RB9 and RB12 were found in room 1. It is possible that they come from the same string.

In his corpus of material from Amarna, Petrie lists moulds which could have been used to produce ribbed beads (Petrie 1894: Pl. XVIII.349 and 352; the letter "m" beside the drawings indicates a mould was found). A bead of this type from Amarna, now exhibited in the Petrie Collection, was clearly moulded in two halves and then assembled, as shown by Petrie corpus illustration 349. The ribbed beads from site P46.33 do not show any sign of how they were shaped. It is possible that they were formed entirely by hand, first as a sphere, and then grooves cut into the surface.

Similar beads occur in the belts of the funerary equipment of the wives of Tuthmosis III (Hayes 1959: 135). A string of spherical ribbed beads was found in the burial of Meket at Gurob (Petrie 1891: Pl. XXVI.16). The spherical form of ribbed bead (RB9) is sometimes said to resemble a nasturtium seed. This suggestion is rather misleading as this plant is a native of South America (my thanks to Delwen Samuel for information on this subject). Details of ribbed beads are given in Table 2.19.

Lentoid beads

One and a half lentoid beads, of type L2, were found. This form is disc-shaped with two convex faces. Both beads appear to have had similar, if not identical dimensions. This type of bead normally occurs as part of a necklace of identical beads, well known during the New Kingdom (Hayes 1959: 132-3, Figs. 69-70). They appear to imitate gold necklaces known as "Shebyu", awarded by the king to certain courtiers (Eaton Krauss, in Brovarski, Doll, and Freed 1982: 238-9, entry 316). Several necklaces of lentoid beads were found in the tomb of Tutankhamun. These may have been made purely for funerary purposes, as they have a large central aperture (approximately 8 mm) to permit threading on what appears to be a length of palm fibre (Cairo Museum exhibits 760, 761, 762, and 765). Details of the lentoid beads are given in Table 2.20.

Cone beads

One cone bead of type C3 was found. The bead is a truncated cone, irregularly shaped with a rough surface. It was almost certainly shaped by hand. The glaze is dark cobalt-blue overall, almost black in colour. For details see Table 2.20.

Plant forms

Two beads of this class were found, rosette-shaped beads of type PF2 (Petrie type 399 or 401). This form is a hemispherical moulding, and detailed only on one face. Ribs, presumably representing petals, radiate out from the central aperture. One bead (8413) has a deposit of fine sand over about one-third of the upper face and most of the underside. The cause of this deposit is not known. It may be sand which stuck to the bead while it was drying after moulding. For details see Table 2.20.

Floral cone

One example of this type was found. It is of type FC2, a moulded cone, with a series of ribs extending from the apex of the cone to its base. The base itself is flat and undetailed. The channel for threading is both angled and offset from the centre of the base. Similar beads have been used as the lower part of cornflower pendants in a string of jewellery from Thebes, now preserved in the British Museum (Stead 1986: Pl. 52). The upper parts of the cornflower pendants are of gold, except for the central pendant, where it is a separate green-glazed faience bead, shaped to resemble the involucre of the flower. Similar green-glazed forms have been found in both the Main City and Workmen's Village at Amarna, and the shape is illustrated in the COA II bead corpus (no. LXVI). This may not be the only use to which beads of type FC2 were put. For details of this type of bead see Table 2.20.

House P46.33: the finds

2.15 Glass beads

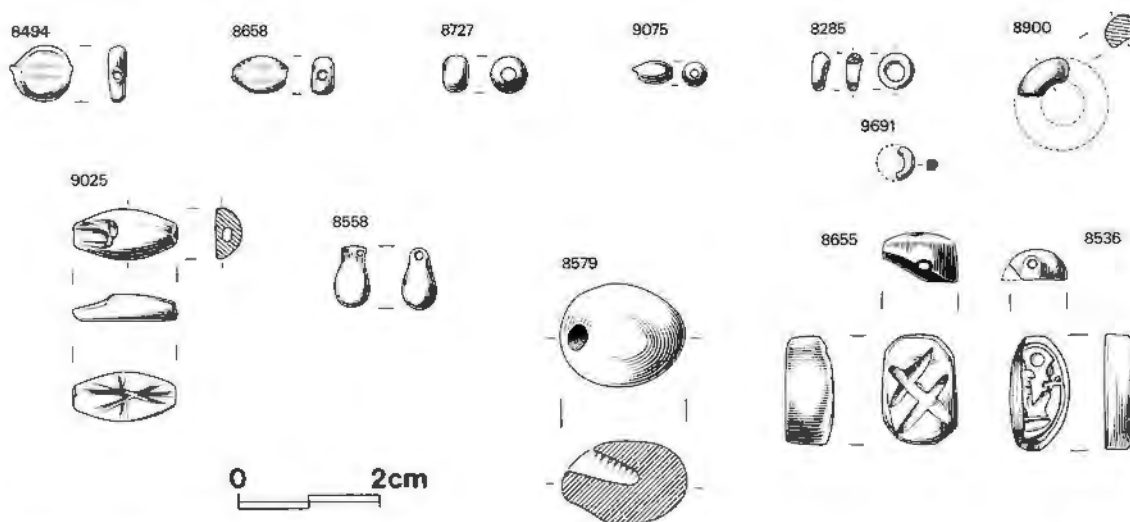


Figure 2.18. Glass and stone beads from house P46.33. Scale 1:1.

Nine glass beads were found in the area of house P46.33 (Figure 2.18), seemingly randomly distributed. The beads are of both opaque and translucent glass. All are of a blue colour, apparently using copper, cobalt, and manganese as colouring agents. One bead, 8900, has a large central aperture coated with a sandy material, as though it had been made around a clay core in a similar fashion to glass vessels. All the other pieces appear to have been made by winding or shaping around a metal wire. No typology has been introduced for glass beads at Amarna, so beads are described by general shape. Beads 8494 and 8658 resemble glass beads found on the belts of the princesses of Tuthmosis III, said to resemble “acacia seeds” (Hayes 1959: 175). The glass beads found at Amarna may not imitate seeds, however, as this shape could easily be made by flattening a spherical bead while the glass was still malleable. For details see Table 2.21. A written description is provided below only of the most complete form, cowroid bead 9025 (Figure 2.18).

9025 Cowroid bead

One third of the upper face of this bead is lost through damage. The bead is pierced along its length, presumably where it was held on a metal wire. The upper face is undetailed. On the base, four scribed lines cross to form an eight-spoked design. This cowroid may have been used as part of a string of beads, in a similar manner to that suggested for steatite cowroid 8536. Similar scribed decorations occur on glass beads found at other Main City sites and the Workmen’s Village.

2.16 Stone jewellery

Three pieces of stone jewellery were found at the site (Figure 2.18). Two pieces are of glazed steatite. The steatite pieces differ considerably in quality of workmanship. It is not clear whether steatite was being glazed in the area. As steatite uses the same copper-blue glaze as faience and would presumably need a similar kiln for firing,² it is possible that this was a related industry located nearby.

Stone 8579 may be an unfinished artefact, possibly intended as a large bead. There is no other evidence for stone working at the site apart from the large number of dolerite pounders (see the

² Bannister suggests that steatite was fired between 840–900°C during glazing (Bannister and Plenderleith 1936).

stone tool section) which could have been used for this purpose.

8536	Cowroid of Amenophis III		
Material:	Glazed steatite		
Glaze:	Copper-blue		
Dimensions:	L = 16 mm	W = 8.5 mm	Th = 4.5 mm
Provenance:	L15 [3189]	(room 14)	

Blue glazed cowroid, damaged on one side. The upper convex face is undetailed. On the base is carved the prenomen of Amenophis III, in an oval border. The piece has been bored longitudinally for suspension. The glaze applied to this cowroid is an unusual mid-blue colour, most steatite having a turquoise or green glaze. The glaze has spread thinly over the surface, except for the recessed inscription, where an accumulation of the glaze has created a darker colour (perhaps an intentional effect). When first excavated, the central hole of the piece contained a 15 mm length of reed (object 8537). The purpose of this reed is uncertain. It is unlikely to have provided the strength or flexibility needed for a necklace or bracelet string, and too combustible to aid in supporting the piece in the kiln. It may represent a method of storing small pieces in the workshop prior to assembly. A similar practice was noted for the remains of a New Kingdom faience kiln at el-Lisht, where beads were strung on reeds "in readiness for firing" (Hayes 1959: 410).

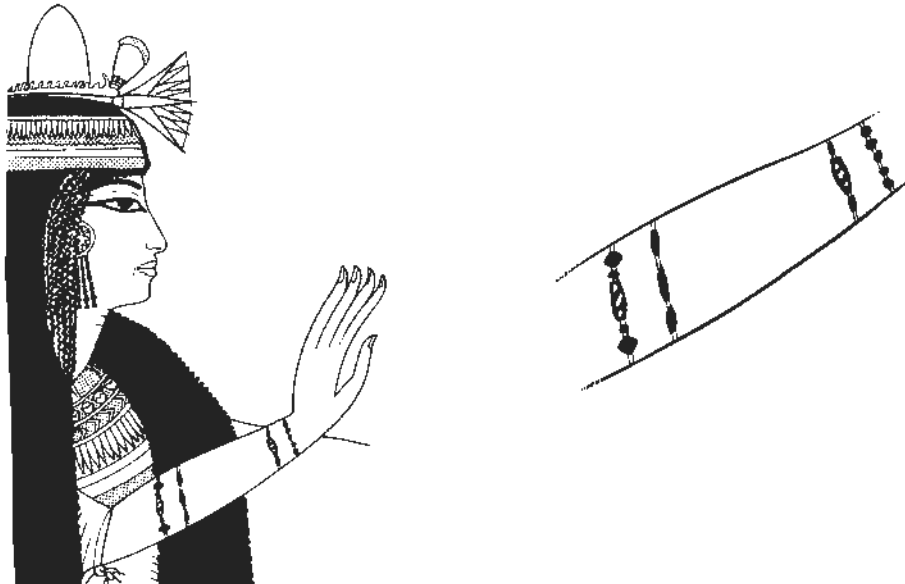


Figure 2.19. Detail of a painting from the tomb of Ipuy, Deir el-Medina (TT no. 217) showing a woman wearing several bead bracelets, including an apparently inscribed cowroid form. Inset at right: details of the jewellery. After the painting by Davies shown in Wilkinson 1983.

As the inscription of this piece is clearly cut, it could have been used as a seal on a signet ring. However, it is more likely to have been used as part of a string of beads, perhaps a bracelet, in similar fashion to examples found in burials at Gurob (Brunton and Engelbach 1927; particularly Pl. LIII). Similarly shaped seals appear to be worn by a woman in a painting from Deir el-Medina (Wilkinson 1983: 34, Fig. 32, reproduced in Figure 2.19).

A number of objects have been found at Amarna bearing the prenomen of Amenophis III. It is not certain, however, whether such pieces were being manufactured at the site.

House P46.33: the finds

8579 Bored stone
 Material: Basalt
 Dimensions: L = 18 mm W = 14.25 mm Th = 12 mm
 Provenance: K15 [3301] surface find

An oval, dark blue stone with a glossy, probably polished surface. A hole has been bored into one end. Possibly an unfinished bead.

8655 Scaraboid
 Material: Glazed steatite
 Glaze: Copper-green
 Dimensions: L = 15.5 mm W = 10.75 mm Th = 7 mm
 Provenance: L15 [3240] (room 4)

Roughly carved, rectangular scaraboid. The base is almost totally lost through damage; there is no evidence to suggest it was inscribed. On the upper surface a groove cut into the front of the body represents the division between the beetle head and wing cases. Four additional lines are cut into the upper body, in a diagonal criss-cross pattern. A hole has been bored lengthways through the body. The surface is glazed green overall, with small areas of black (?discoloration) in the glaze. The unglazed areas exposed by damage have discoloured brown. When compared with contemporary faience scarabs, this appears a crude representation. This may show that a significance was attached to the material from which the amulet was made.

2.17 Tiles and inlays

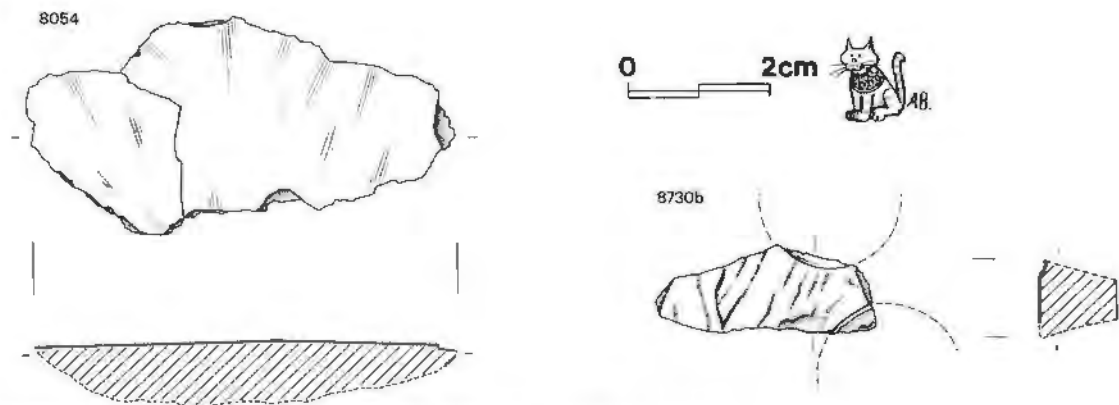


Figure 2.20. Faience tile fragments from house P46.33. Scale 1:1.

The terms “tile” and “inlay” are often used to describe the same type of object at Amarna. The definition proposed here for pieces from Amarna is that a tile is a rectangular glazed form, with or without additional painted design, where the outline does not contribute to any larger pattern. An inlay is a piece shaped to resemble the object it represents, where the outline is intended as part of a larger pattern or design. As an example of this, inlay 9022 is shaped to resemble a cornflower, and is probably designed to be part of a larger floral border.

Large inlays and tiles appear to have been used primarily to decorate official buildings, particularly temples and palaces. They frequently depict designs found in wall paintings and reliefs at Amarna. A small inlay depicting a cornflower is also included in this section. Small inlays appear to have been used to decorate vessels and other faience objects (for example, the cornice fragment illustrated in *COA* III: Pl. LXXVIII.5, no. 33/262, cf. p. 124, from the “Clerks’ Houses”). If most of the inlays and tiles found at site P46.33 were manufactured locally, their

purpose is not clear. The majority of faience objects thought to have been produced in this area are small items of jewellery, for which one might expect to find a ready market in any nearby residential area. It is possible that larger private houses used tiles or inlays for decoration, but there is little evidence to support this. An examination of the records of inlays found in residential areas shows that most of the tiles and larger inlays found in private houses bear designs more appropriate for palaces or temples, such as leaping calves and Nile fish. It therefore seems likely that, like tile 8730b (described here), they originate from official buildings.

Sixteen fragments of copper-blue glaze tile were found in house P46.33, of which half come from rooms or outbuildings 11–14. It is therefore possible that they were manufactured locally. Such plain glazed tiles have been found both in the Main City and Workmen's Village sites. Blue glaze tile fragments have been found in considerable numbers during recent work at the Small Aten Temple. It seems likely that, while they do not fit into any of the better known decorative schemes used in temples and palaces (e.g. Nilotic landscapes and floral borders), they still played a significant role. It is possible they were used to decorate the ancillary buildings of the temple. The most complete blue tile fragment from P46.33 has been illustrated and fully described, as representative of the type. For a list of the tile fragments from area P46.33 see Table 2.22.

Tiles

8730b	Fragment. Inlaid tile
Glaze:	Dark copper-blue 321U/328U
Dimensions:	L = 31 mm W = 13 mm Th = 11 mm

Irregularly shaped fragment of tile, preserving the original thickness and glazed upper surface. The glazed surface is a copper-derived turquoise colour, with short black lines, most probably manganese (Kaczmarczyk and Hedges 1983: 174–5) crossing the surface. There are traces of two (originally circular) recesses between 0.5–0.75 mm deep, which have a far thinner glaze than the surrounding surface. The exposed body material is porous and sandy, with inclusions up to 0.75 mm in size. The glaze is about 0.25 mm thick, and merges with the body material, forming an "interaction layer" (see notes for tile 8054).

This fragment undoubtedly originates from a tile painted with foliage designs and inlaid with daisy-like flowers. Complete and fragmentary tiles with this design were found during the excavations of the Great Palace by Petrie (Petrie: 1894: 12) and later by Pendlebury (*COA III*: 75, Pl. LXXII.1). Petrie comments that the tiles had been removed from the walls, and that, where the tiles had broken, the daisy inlays had been salvaged for re-use. A small number of fragments of similar inlaid tiles have been found in private houses in the Main City, and it seems reasonable to conclude that in such cases they represent material acquired from the Great Palace rather than house decoration.

8054	Fragment. Blue glaze tile
Glaze:	Mid copper-blue 312U
Dimensions:	L = 60 mm W = 30.75mm Th = 9.25 mm
Provenance:	K16 [3030] (surface)

Two connecting pieces, preserving part of the glazed face and a small area of body material. The glazed surface is matted, and covered with fine scratches. In section the glazed face can be seen to change angle slightly, though the intention was most likely to create a flat surface. The glaze is up to 0.25 mm thick, with a large interaction layer between the glaze and body material. The body material is very sandy and contains a large number of air holes. The comparatively recent central break shows the body to be hard and glassy, with a faint yellow-green colour. Both the hard body and interaction layer would suggest that this tile was fired at a high temperature, or that the flux content of the body material was high (Vandiver, in Kaczmarczyk and Hedges 1983: A28).

There is no record of a complete blue glaze tile being found during EES excavations at Amarna. Large fragments found during earlier Main City excavations suggest that, like the inlaid tiles published in *COA III* Pl. LXII.1, they were rectangular in shape.

House P46.33: the finds

Inlays

8278	Cornflower (similar to Petrie type 486)
Glaze:	Upper: yellow (Y) or yellow-green (YG) 383U Mid: green (G) 338U Lower: cobalt-blue (CB) 534U
Dimensions:	L = 16.75 mm W = 9.5 mm Th = 2.5 mm
Provenance:	L15 [3069] (room 11)

Moulded design glazed in two main colours (Figure 2.21). The upper part of the front face depicts the involucre as a series of raised lobes. This area is glazed green, which merges with a yellow colour at the top of the body. Below this, the petals are represented as a series of ribs which flare out towards the base. These are glazed dark blue. At the rear of the object the same sequence of colours is repeated, though here the divisions between the colours are less sharply defined. A small area of unglazed body material adheres to the upper part of the front face. As no beads were attached to this piece to permit its use as an item of jewellery, it was presumably intended for use as an inlay. The two colours used at the top of this design are unusual. This area of the design is usually glazed a light green colour formed by mixing lead antimonate (a yellow glaze) and copper (blue). For some reason the yellow glaze appears to have partly separated out here.

Cornflower collar pendants were also found in house P46.33, numbers 8450 and 8976. This form was first identified as a thistle but is more likely to represent a cornflower (*Centaurea depressa*, Germer 1985: 173), examples of which were found as part of the plant garlands placed on the mummy of Tutankhamun (Newberry, in Carter 1927: Appendix III, 90–3).

8723	Fragment. Unidentified
Glaze:	Red-brown 484U Core: 484U/485U
Dimensions:	L = 18mm W = 14.5mm Th = 5.25mm
Provenance:	K15 [3332] (room 3)

Rectangular fragment, with two rounded faces. One irregular edge (shown at the top on the drawing) is glazed and apparently original. The corresponding lower edge is broken. The core is almost the same colour as the glaze, showing that it was deliberately coloured, a type of faience termed by Lucas variant C (Lucas and Harris 1962: 162; also Kaczmarczyk and Hedges 1983: 204–5). The size of the fragment suggests it may have been used as an inlay, though this is by no means certain.

9022	Fragment. Cornflower
Glaze:	Upper: copper turquoise-blue 324U Lower: dark cobalt-blue 540U/541U
Dimensions:	L = 19.5 mm W = 18 mm Th = 5.75 mm
Provenance:	L16 [3749] (room 7)

The lower part of a moulded design depicting a cornflower (for this identification see inlay no. 8278). Five ribs on the upper surface represent petals, which radiate out towards the base of the design. On the undetailed rear face, the surface is coloured a light copper-blue, with traces of the dark-blue glaze from the front of the design appearing at the left and bottom edges. This suggests that a copper-blue glaze was first applied to provide the green colouring of the involucre or upper half, and the lower part was then re-coated with a cobalt glaze. A light blue-green colour has accumulated in the hollows of the moulded design. This may be from the underlying copper-based glaze, or from copper present within the cobalt-coloured glaze (Kaczmarczyk and Hedges 1983: 43).

The use of copper alone to provide the colouring for the involucre is unusual as this area is normally glazed with a lead antimonate/copper mix to produce the light green colour. The broken edge of this piece has exposed an unusually white body material without any residue from the glaze colours or staining. This is also visible at the rear of the body, where the surface is pitted

and small areas of glaze have been lost. The size of this piece suggests it was intended for use as an inlay.

9079 ? Rosette (similar to Petrie type 418)
 Glaze: Cobalt-blue damaged surface
 Dimensions: L = 12.75 mm W = 19.5 mm Th = 6 mm
 Provenance: L16 [3334] (room 14)

Part of a moulded floral design. On the upper surface, three ribs, possibly representing petals, radiate out from a missing central area. On the underside there is a raised outer edge (as shown in section). The glazed surface is badly abraded. Assuming the complete piece was circular, we may estimate the diameter at 33 mm. The exact use of the piece is uncertain. The surface design and size suggest that it was intended as an inlay, though no inlay examined to date has a raised edge around the base.

10.18 Decorative elements for buildings

This class of material is usually represented by large moulded bunches of grapes, intended to be suspended from beams or architraves (described by Anthes in Hölscher 1951: 46, Fig. 58). In some cases these large faience bunches may continue a painted ceiling design showing a grape vine, such as in the chapel of house T36.11 (*COA II*: 24-5, no. 29/239). Three pieces of large grape bunches were found in house P46.33 (Figure 2.21). It is not clear whether they were manufactured nearby. Similar large grape bunches have been found mainly within official buildings, such as the North Palace at Amarna. It is possible that such forms, like the tiles and inlays, were acquired from official buildings by the occupants of house P46.33. The other piece included in this section is of less certain function. It could be part of a large three-dimensional cornflower design, of which the moulded upper parts have been found at Amarna (currently unpublished). Cornflower pendants of a similar two-piece design are known; see the comments on the "floral cone bead" in the bead section). Presumably such pieces were used in a similar way to the large grape bunch designs. A similar fragment, called a "tassel" by the excavators, was found at Amarna during the 1930-1 season, in house T35.24 (30/175, *COA II*: 48).

8383 Fragment. ?Flower design
 Glaze: Discoloured ? cobalt-blue
 Dimensions: L = 19 mm W = 15.5 mm Th = 5.5 mm
 approximate diameter = 44 mm
 Provenance: K16 [3181] (room 10)

Part of a (presumably) bell-shaped design, probably imitating a flower. On the upper, convex face, are traces of six ribs which extend away from an undetailed pierced central area. Around the outer edge a rounded indentation, combined with a more pronounced recessed area, may imitate a division between flower petals. On the underside, only four ribs are shown, separated from an undetailed area by the rounded indentation in the outline mentioned above. As illustrated, the stance of the piece is thought to be correct, but the diameter is less certain.

8492 Fragment. Large grape bunch
 Glaze: Copper-blue 287U/288U
 Dimensions: L = 19 mm W = 22.5 mm Th = 18.75 mm
 Provenance: L15 [3226] (room 13)

Part of a large moulded bunch of grapes. Two original faces remain. The outer face has a row of lobes representing individual fruits. At the rear there is a flat glazed area, which can be seen to change angle along one damaged edge. The exposed body material appears soft and friable, though it is composed of fine particles below measurable size. The change of angle on the rear face of this moulding shows that this is probably the centre section of a bunch of grapes, with one quarter cut away for attachment to a beam (see supplementary view).

House P46.33: the finds

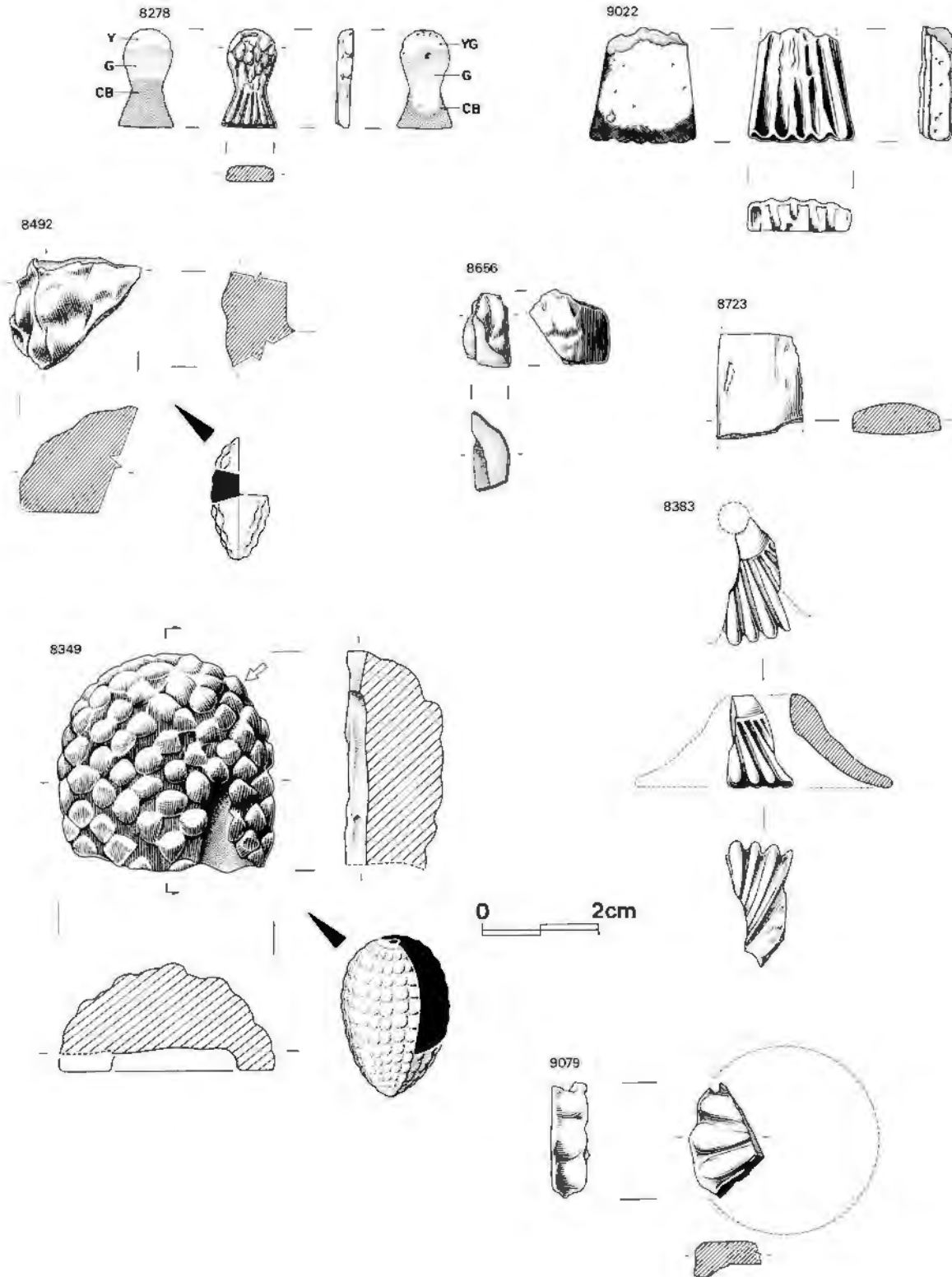


Figure 2.21. Faience inlays and large decorative elements from house P46.33. Scale 1:1.

8349 Fragment. Large grape bunch
 Glaze: Cobalt-blue 288U-279U/287U
 Dimensions: L = 37.75 mm W = 37.5 mm Th = 17.25 mm
 Provenance: L15 [3230] (room 11)

Upper part of a bunch of grapes, preserving about half of one moulded face. The outer surface clearly depicts the individual fruits. The glaze varies between a mid to dark blue-grey colour. At the top (arrowed on the drawing) "stick" marks show where it may have come into contact with another object during firing. The body material is an off-white colour, changing to a purple-grey shade near the glazed surface. Viewed in section it can be seen that the piece was pierced at the rear.

This fragment is undoubtedly from a fully three-dimensional grape cluster, made by attaching two moulded halves together with a faience slurry (this is still visible along the surviving edge). The moulding was pierced at the top to allow a metal hook to be inserted (see supplementary view). This design of grape moulding is not common at Amarna, only three other examples are known from the EES excavations (one example shown in *COA III*: 120, Pl. LXXVII.3).

8656 Fragment. ?Large grape bunch
 Glaze: Dark cobalt-blue 281U
 Dimensions: L = 13 mm W = 13.75 mm Th = 6.25 mm
 Provenance: L15 [3240] (room 4)

Small area of a coarse-bodied object, preserving two original faces. The larger face has moulded recesses in a convex surface, while the smaller adjoining face is undetailed and only slightly rounded. The glaze is a blue-grey colour mottled with green flakes (apparently a common feature of cobalt glazes). The undetailed surviving face has a thinner coating of glaze — possibly this surface was laid face down during the drying and glazing processes. The body material is coarse and appears to contain both sand and small stones up to 0.5 mm in diameter. This material seems to be divided into inner and outer areas (as shown on the supplementary drawing), possibly caused by the preparation of the body material or by different stages which occurred during the moulding of the piece.

Although not as distinct as pieces 8349 and 8492, this fragment appears to be from a large bunch of grapes designed for suspension. The relative lack of detail on this fragment can be explained if (as seems the case) it was from the edge of the piece. The outer edges of moulded faience objects are usually less well detailed than the central area, as any undercutting in this area would either be lost or damaged when the impressed body material was removed from the mould (all the evidence from Amarna suggesting that the moulds used were in one piece).

2.19 Miscellaneous faience

8618 Severed bull head (Petrie type 307)
 Glaze: Damaged ?Copper-blue
 Dimensions: L = 16 mm W = 17.75 mm Th = 3.25 mm
 Provenance: L16 [3320] (surface)

Complete moulding of a bull head, facing left. The surface is pitted, and most of the glazed surface (if ever present) has been lost. This may be due to weathering, though most faience found on the ground surface at Amarna retains its glaze. Alternatively, it may show an unsuccessful attempt at glazing. See entry 8975 for notes on this form.

8896 Vine leaf (Petrie type 542)
 Glaze: Copper, light grey-blue. No Pantone equivalent
 Dimensions: L = 19.5 mm W = 21.5 mm Th = 2.5 mm
 Provenance: K16 [3349] (room 3)

House P46.33: the finds

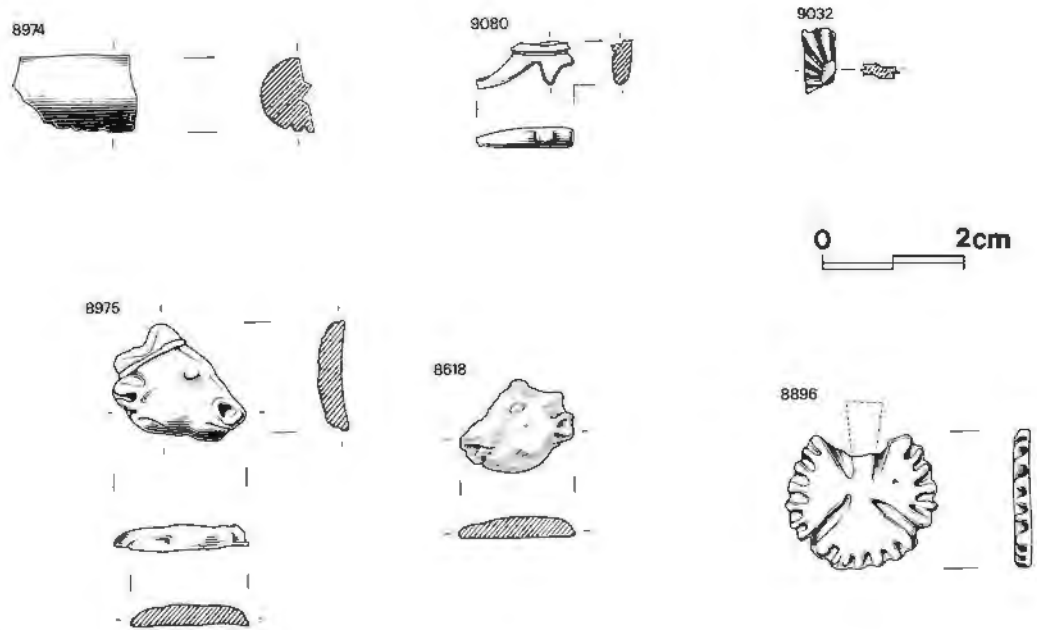


Figure 2.22. Miscellaneous faience pieces from house P46.33. Scale 1:1.

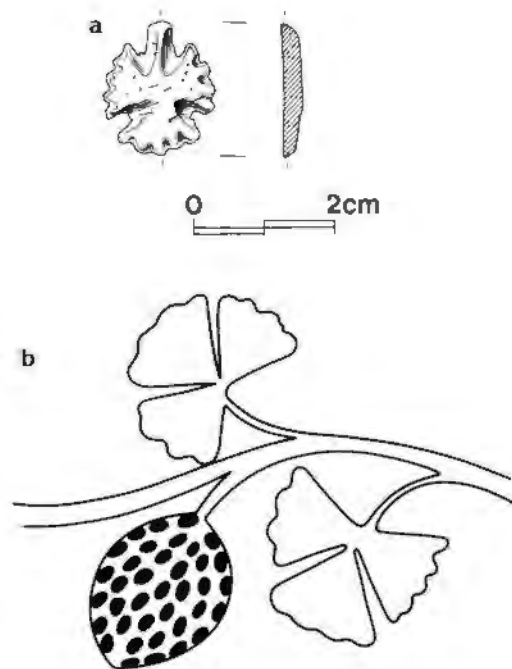


Figure 2.23. (a) Vine-leaf moulding from the 1923-4 season at Amarna. Excavation no. 23-4/1024 from house R45.110, preserved in the Ashmolean Museum, Oxford, no. 1924.143/1024. (b) Detail of the vine design from the painted pavement in the North Harim of the Great Palace at Amarna (after *COA* III: 41, Fig. 10).

Only the moulded body of this piece remains, consisting of three triangular sections with serrated outer edges, extending out from a central stem (now missing). Comparison with complete examples suggests that the stem would probably have followed the shape indicated by the broken lines. Although not a naturalistic depiction, the design can be identified as the vine leaf of the plant *Vitis vinifera* (Germer 1985: 116–18) by comparison with paintings from Thebes and Amarna (Figure 2.23b).

Three illustrations of this form are known from Amarna, the first being no. 542 in Petrie's corpus, the others (Figure 2.23a) from excavations by the EES in 1923–4 (object nos. 23–4/701, 23–4/1024). All three of these pieces appear complete, yet have no ring bead attached for suspension as a pendant. Their purpose thus remains uncertain. In the final corpus introduced in 1929 it was classified as an inlay, using the original Petrie number.

8974 Unknown - fragment
 Glaze: Mid copper-blue process blue U/307U
 Dimensions: L = 17.5 mm W = 11 mm Th = 6.5 mm
 Provenance: K15 [3703] (room 1)

Part of an unidentified form. In shape it resembles half a cylinder. The surviving outer face is curved and glazed light blue. The body material is soft but has no visible particles. On the outer surface the glaze is up to 0.25 mm thick. In places the glaze has cracked, exposing the underlying body material.

8975 Severed bull head (Petrie type 307)
 Glaze: Mid copper-blue 306U/process blue U
 Dimensions: L = 19.25 mm W = 13.5 mm Th = 4 mm
 Provenance: E15 [3703] (room 1)

Complete depiction of a bull head, facing right. Part of the ear and possibly the horns have been lost, probably during the moulding process. The underside of the piece is concave, a feature possibly caused when the body material was pressed into the mould. The glaze at the rear of the moulding is rough and (when viewed with a x30 magnification) contains a quantity of fine brown-coloured sand. Possibly this piece rested on a bed of fine sand during firing.

Bull-head designs are one of a number of small pieces found at Amarna without suspension beads or any indication that they were used as jewellery. The forms include a trussed bull (Petrie nos. 304–5), bull head (nos. 307–8), bull leg (no. 309), Bolti-fish (no. 330), and a plant form which may be a lettuce (no. 469). Samson suggests that similar pieces may have been used as inlays (Samson 1972: 79, 90). While this remains a possibility, some form of votive role seems more likely in view of their frequent use in foundation deposits, for these forms are all documented in foundation deposits of official buildings from the time of Tuthmosis IV until the reign of Rameses IV (Weinstein 1973: Pl. 36). At Amarna, such pieces have been found mainly in the private housing of the Main City and Workmen's Village. While these pieces could have come from a workshop making material for foundation deposits (although no definite foundation deposits have been discovered at Amarna, Weinstein 1973: 141–4), such pieces (as depictions of food offerings) may have had some form of votive use within the community.

9032 ? Palmette fragment
 Glaze: Copper-blue 319U/363U
 Dimensions: L = 9 mm W = 4 mm Th = 1.5 mm
 Provenance: K15 [3684] (room 2)

This appears to be part of a larger design, preserving two glazed surfaces. The upper moulded face has a recessed area (possibly oval in shape when complete) with rounded ribs extending away from this. The recessed area has been impressed in such a way that there is a corresponding raised area on the rear face. Body material exposed by damage appears very hard and is white. While palmette pendants with similar designs exist, none examined so far shows that the moulded design has affected the shape of the underside in the manner shown here.

House P46.33: the finds

9080	<i>Wedjat</i> fragment		
Glaze:	Copper-blue	319U/320U	
Dimensions:	L = 3.75 mm	W = 6 mm	Th = 3 mm
Provenance:	L16 [3334]	(room 14)	

Part of a moulded *Wedjat*-design, showing the lower edge of an eye with part of the characteristic hawk markings below. On the upper face, these two areas are divided by a narrow groove. An area of damage above the border of the eye may be the remains of a pupil. The body material is a whitish-green colour. The fine detail and general proportions of this fragment, together with its thickness, suggest that it is not from a ring bezel or *Wedjat*-eye bead. Its intended purpose is unknown.

2.20 Glass rod and strip

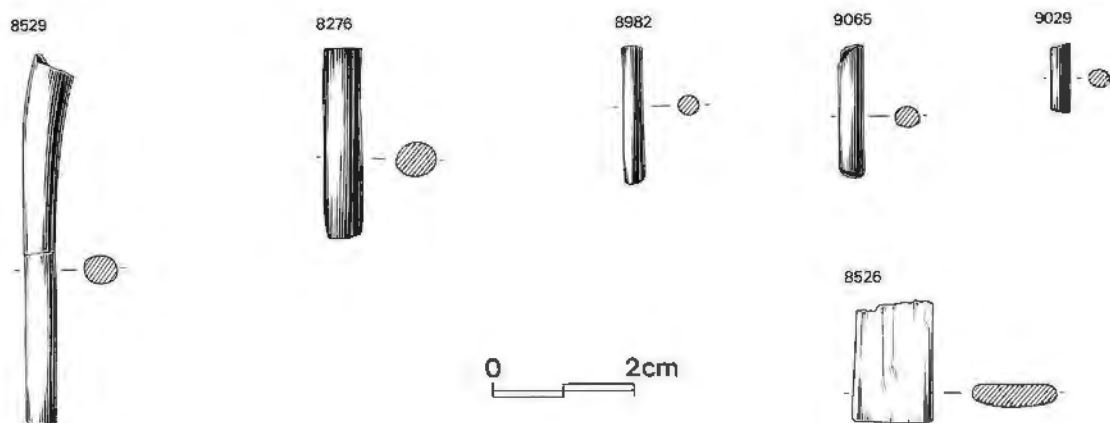


Figure 2.24. Glass rod and strip from house P46.33. Scale 1:1.

Six pieces of glass rod and one piece of glass strip were found scattered across the site of house P46.33 (Figure 2.24). They appear to be randomly distributed, in a similar fashion to the glass beads and vessel fragments. Glass rods (and presumably also strips) could have been used to form beads by wrapping the heated rod around a copper or bronze wire (as shown in Petrie 1894: Pl. XIII.53–61, and *AR* V: 54, Figure 2.24). Such rods may also have been used to make vessels by wrapping the heated rod around a sand or mud core (although it is disputed whether glass rods were used for this purpose). The resulting form could then be rolled to give a smooth surface. Vessel piece 8483 and bead 8900 have a brown deposit on their inner faces which resembles sand from such a core. Similar glass rods and strips were found in the “glazing works” excavated by Petrie (1894: 25, Pl. XIII) and more recently at various sites across the Main City, where they occur in both private houses and official buildings. In contexts such as those of house P46.33 it is difficult to know whether glass was being manufactured here or whether the finds represent merely the use of ready-prepared glass (possibly from an official centre) to create objects.

The range of colouring agents used in making the glass rods (with the exception of piece 8276) appear to be copper and cobalt to produce shades of blue, and manganese to create a purple colour (Lucas and Harris 1962: 187; Kaczmarczyk and Hedges 1983: 34). The same range of colours occur on the beads and vessel fragments from house P46.33, though this may be coincidental, as shades of blue and purple appear to be the most common colours for glass at Amarna.

Glass rod 8276 is semi-transparent, and does not appear to include any deliberate colouring agent. Its green-grey colour is probably due to iron oxide, an impurity in the sand used for its manufacture (Hodges 1964: 55). Glass without a colouring agent added is rare during the New Kingdom, though Lucas notes the presence of "colourless transparent glass" used as inlays on the funerary equipment of Tutankhamun (Lucas and Harris 1962: 190), and a fragment of a clear glass earring was found in East Street 11 during the 1922 excavations at the Workmen's Village (COA I: 72).

(For a list of the glass rod and strip from house P46.33 see Table 2.23).

2.21 Copper/bronze³

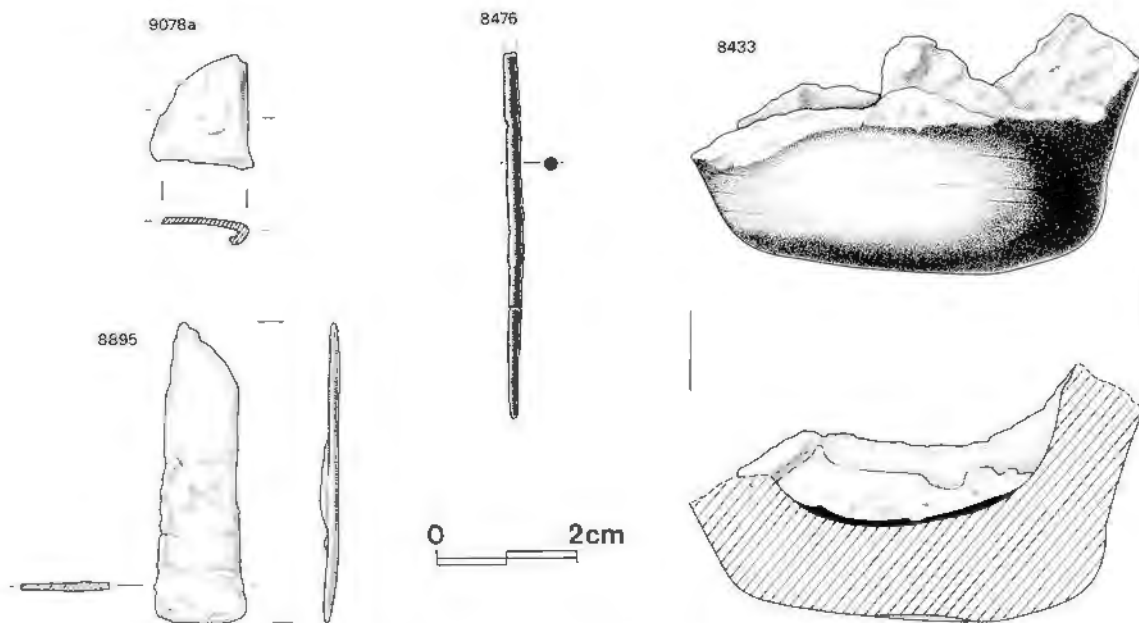


Figure 2.25. Metal fragments and pot base containing metal residue. Scale 1:1.

The majority of copper/bronze objects found during the excavation of house P46.33 survive only as small corroded pieces, preserving no original outline. Four pieces may be off-cuts of sheet metal (8517, 8561, 9078a and 9078b). The only recognisable artefacts (Figure 2.25) are part of a needle (8476) and possibly part of a blade (8895).

The base of a pot containing oxides of copper (8433; Figure 2.25) may be connected with the production of metal, but this is by no means certain. A quantity of industrial waste from the site is thought to be connected with the production of lead, copper, or copper-arsenic alloy (see p. 43). It is possible that the copper/bronze pieces represent scrap accumulated for use in the production of turquoise-blue glazes (Kaczmarczyk and Hedges 1983: 258). Alternatively, they might have been intended for use in trade (Janssen 1975: 105, 442). There is no recognisable concentration of metal objects in any one area of the excavation (see Table 2.24).

8433	Pot base with metal deposit
Pot Fabric:	IV.1 Sherd No = 76409
Dimensions:	W = 63 mm H = 36 mm
Provenance:	K16 [3033] (room 6)

³ It was not possible to analyse any of the pieces from the 1987 season.

House P46.33: the finds

Base of a wheel-made vessel, containing a corroded green-coloured deposit, flecked with small areas of red, up to 1 mm thick. The base has been identified by P. Rose as coming from an unslipped amphora, of shape group 20 (Rose 1984: 137). This deposit has been visually identified as cuprous oxide and cupric oxide, probably representing a residue left from the manufacture of metal or frit (information courtesy F.J. Weatherhead). Where the deposit has broken away, the exposed section is black.

2.22 Mud and pottery objects⁴

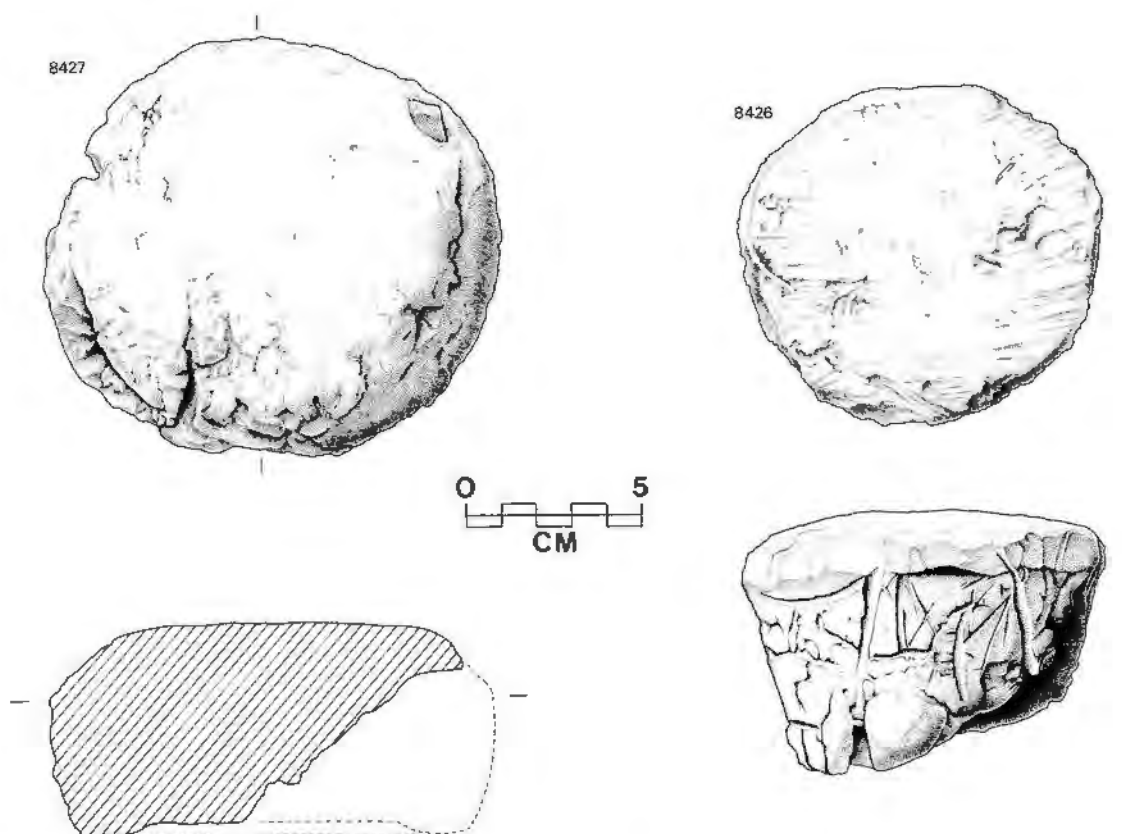


Figure 2.26. Jar sealings from house P46.33. Scale 1:2.

8426	Jar bung
Material:	unfired Nile silt
Dimensions:	H = 75 mm W = 103 mm
Provenance:	K16 [3178] (room 6)

Round hand-formed mud jar bung, fitting originally a tall vessel neck. The upper surface is slightly convex. The increase in diameter of the bung towards its top suggests that, rather than sitting fully inside the neck (cf. Hope 1977: Fig. 8a), it may have rested in the vessel mouth,

⁴ Notes for entries 8426 and 8427 were written by Pamela Rose.

perhaps then to be capped with a sealing proper. The bung is made from Nile silt incorporating much sand and large-sized chaff. The latter has left clear impressions on the outer surface. Hope cites a similar mud-and-chaff bung from Malkata (*op. cit.*: 14). The clay was used apparently in a fairly wet state, with a moisture content of approximately 35% (R. Hughes, personal communication). The high moisture content accounts for the finer texture of the bung's top surface, where a "patting" action has brought up a finer clay element.

Objects 8426 and the following object 8427 (Figure 2.26) were found together, but it is unlikely, given their respective diameters, that they were both used in the sealing of the same vessel.

8427	Jar sealing
Material:	unfired Nile silt
Dimensions:	H = 60 mm W = 130 mm
Provenance:	K16 [3178] (room 6)

Round hand-formed mud jar sealing, of which approximately two-thirds survives. The upper surface is flattened; the underside is also flat, with a low raised rim around the outer edge. This would have enclosed only the uppermost part of the stoppered vessel's rim. The diameter of the latter could not have been much greater than 80 mm. This approximate diameter size is most commonly found in amphorae of Group 21 (Rose 1984: 137, and Figure 10.1). The sealing corresponds most closely to Hope's cap and bottle sealings but is not precisely similar to either (Hope 1977: 26 and 28; Fig. 6).

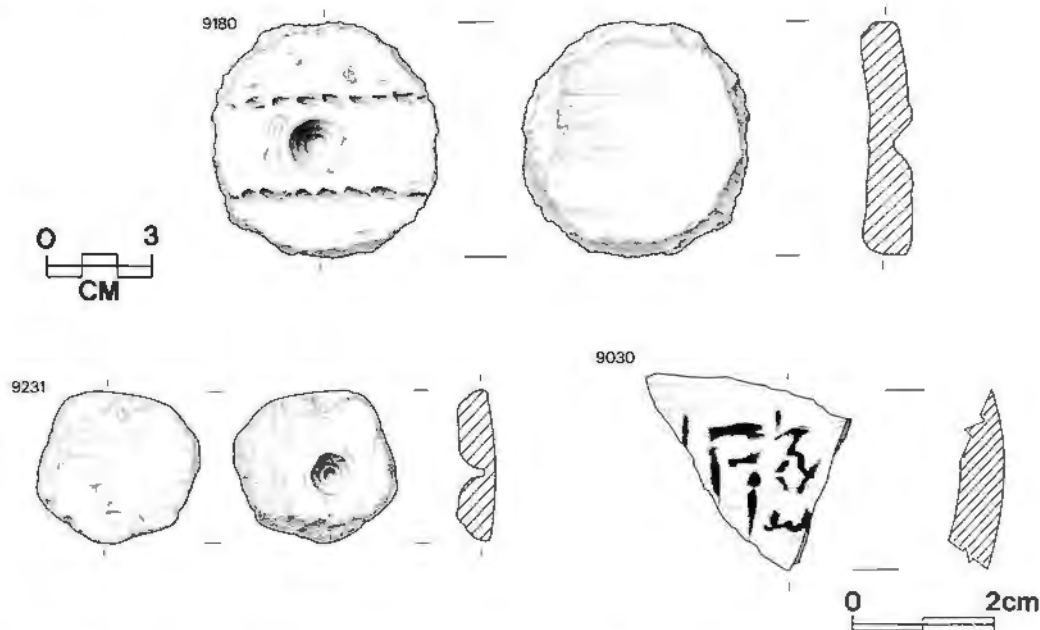


Figure 2.27. Pottery objects from house P46.33. Nos. 9180, 9231 at 1:2; no. 9030 at 1:1.

The sealing is made from soft grey-brown Nile silt, showing many surface cracks where individual lumps of clay have not blended together. This indicates that the material was used in a moderately dry state, possibly to limit shrinkage and thereby ensure that the seal stayed in place when dry. R. Hughes suggests that the mud had a moisture content of c 20–25%, as compared with a typical moisture content of 30–40% for mud brick. A small fragment of fired pot became included in the prepared mud, now visible on the sealing's upper surface. The sealing was not stamped. No traces were found of the means by which the vessel mouth was stoppered before the seal was applied.

House P46.33: the finds

9030 Fragment. Jar label
Material: Marl clay A9
Dimensions: L = 29 mm W = 27.5 mm Th = 6 mm
Provenance: K15 [3684] (room 2)

Potsherd from a wheel-made vessel, probably an amphora shoulder (information courtesy Pamela Rose). The surface is coated with a cream-coloured slip, with part of an inscription in black ink.

9180 Re-used potsherd
Material: Nile silt type 1.1
Dimensions: L = 32 mm W = 33 mm Th = 6.75 mm weight: 54 g
Provenance: L16 [3707] (room 15)

Red-slipped clay disc, probably originating from a closed-form vessel, possibly a large biconical jar (information courtesy Pamela Rose). The inner (concave) surface and exposed core are grey-black in colour. Two lines of string impressions cross the outer surface. Wheel marks are visible on the inner surface. The edges of the sherd have been chipped to form a rough disc, and a hollow bored into the centre of the outer surface.

9231 Re-used potsherd
Material: Nile silt type 1.4
Dimensions: L = 23 mm W = 21.5 mm Th = 5 mm weight: 9.6 g
Provenance: K15 [3332] (room 3)

Unslipped potsherd, red-brown in colour. Probably from a closed form vessel (information courtesy Pamela Rose). Wiping marks on the inner and outer surfaces are offset at 90° to one another. The sherd has been chipped to form a rough hexagon. All edges have been abraded, perhaps intentionally smoothed. On the inner face, a cone-shaped depression has been bored. The uses to which pieces 9180 and 9231 (Figure 2.27) were put are unknown. Perhaps they were left unfinished, where the intention was for the pieces to be pierced. Alternatively the hollows in the surface may have served a purpose in themselves, such as forming a socket for a drill. Similar pierced sherds have been found during excavations at the Workmen's Village and Main City.

2.23 Vessels

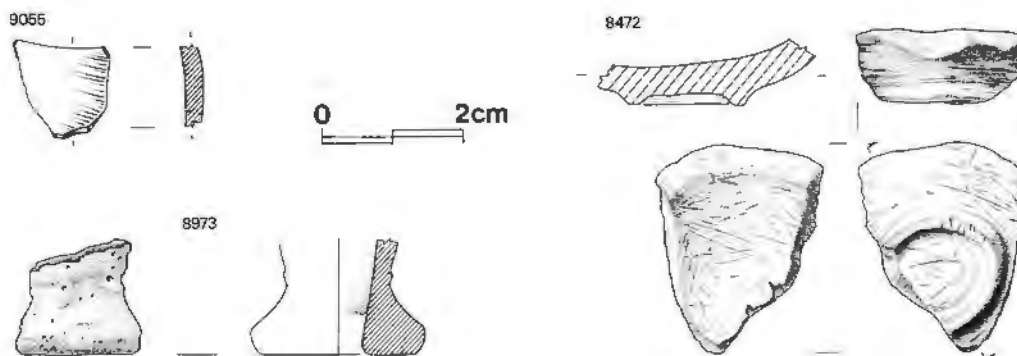


Figure 2.28. Stone, glass, and faience vessel fragments from house P46.33. Nos. 9055, 8973 at 1:1; no. 8472 at 1:2.

Five vessels, of glass, stone and faience, may be represented by fragments found during the excavation of house P46.33 (Figure 2.28). The presence of possible glass vessels here is

particularly interesting, as glass-working equipment (glass rods and strip) was found nearby. Cooney suggests that glass vessels were only made by official workshops (Cooney 1976: 141), but it seems possible that simple vessels could be made by small centres located within private houses, just as was the case with faience.

Stone

8472 Fragment. Base
 Material: Soft, grey-brown calcareous mudstone
 Dimensions: L = 59 mm W = 47 mm H = 21 mm
 Provenance: L15 [3073] (room 14)

Part of the base and lower part of a vessel wall. Both the interior and exterior are covered with coarse to medium-fine scratches from the shaping process. The broken edges of the fragment are rounded, probably due to the abrasion of the surrounding sand on the softer material of the vessel.

Faience

8973 Fragment. ?Base
 Material: Faience
 Glaze: Mid copper-blue 307U
 Dimensions: H = 16 mm W = 17.5 mm Th = 8.5 mm
 Provenance: K15 [3073] (room 1)

Curved fragment, probably from a small vessel. The main faces are glazed, as is the one surviving edge. The thin coating of glaze over this edge, together with small areas of unglazed body material present here, suggest this is part of a base rather than a rim. The body material exposed by damage is coarse, containing particles up to 0.25 mm in diameter. The glaze has soaked up to 1 mm into the body material. The glaze on the vessel surface is uneven, and there are hollows which appear to be the remains of air bubbles in the glaze.

Glass

8483 Fragment. ?Vessel
 Material: Glass
 Colour: Copper-blue
 Dimensions: L = 4 mm W = 3.5 mm Th = 2.5 mm
 Provenance: L15 [3185] (room 11)

Flake of glass. No recognisable original surfaces. Not illustrated.

8899 Fragment. ?Vessel
 Material: Glass
 Colour: Dark cobalt-blue
 Dimensions: L = 11 mm W = 6 mm Th = 2 mm
 Provenance: K16 [3324] (room 3)

Irregularly shaped fragment, possibly part of a vessel. Not illustrated.

9055 Fragment. ?Vessel
 Material: Glass
 Colour: Cobalt grey-blue
 Dimensions: L = 14 mm W = 12.5 mm Th = 2.5 mm
 Provenance: L16 [3336] (room 15)

House P46.33: the finds

Irregularly shaped fragment, probably part of a vessel wall. The inner face is coated with a fine brown substance resembling sand, suggesting that it was made around a core of sand or mud (see notes on glass rod and strip).

9159	Fragment. ?Vessel
Material:	Glass
Colour:	Copper-blue
Dimensions:	L = 10 mm W = 8.5 mm Th = 4.5 mm
Provenance:	K15 [3685] (room 1)

Irregularly shaped fragment, with heavily abraded surfaces. Possibly part of a vessel. Not illustrated.

2.24 Stone tools⁵

The majority of stone tools from house P46.33 (Figures 2.29 and 2.30) are hammer-stones and rubbers of dolerite. The hammer-stones appear to have been used for a pummelling rather than a hard striking action. Where the stones show signs of rubbing, this has been done using the rough rather than smooth surfaces as these have the advantage of gripping small particles more effectively while they are being crushed.

Dolerite hammer-stones, or pounders, are well known from stone-working areas, particularly quarries (Lucas and Harris 1962: 410). Pendlebury noted the presence of "stone pounders" in the Royal Wadi at Amarna (Martin 1974: 10) and several are known from the Royal Tomb itself (Martin 1974: 96, Pl. 57, Figs. 416–17). They may also have played a part in metal-working (Schcel 1989: 28–31). It seems possible, however, that the stone tools found in house P46.33 had a more domestic function, perhaps in the preparation of food. If stone tools were found (as seems likely) during previous Main City excavations, they were not often recorded. Stone tools are occasionally referred to in the *COA* volumes (for example the "granite corn rubbers" from house T36.5, in *COA* II: 50) but not illustrated.

All dolerite tools from this site use as their basis water-worn naturally rounded stones. Similar stones occur at several locations in the eastern desert (Lucas and Harris 1962: 410). The majority of pieces described here appear to have been selected for their small size, convenient for holding in one hand. The remainder of stone tools from P46.33 use locally available materials, chert and sandstone. In at least one case (8205) sandstone from an official building appears to have been re-used.

8205	Relief fragment/? Whetstone
Material:	Medium grain, hard quartzitic sandstone
Dimensions:	L = 103 mm W = 110 mm Th = 51 mm
Provenance:	K16 [3030] (surface)

Irregularly shaped fragment, preserving only one worked surface. Two recessed areas in the worked surface may be the remains of incised hieroglyphs. The broken edges of the fragment are rounded, and there are polished facets on the relief surface, suggesting that the piece could have been used to sharpen tools. This piece, along with tile 8730, suggests that the occupants of house P46.33 were acquiring material from a (possibly disused) official building.

8258	Triangular fragment/? Whetstone
Material:	Fine-grained hard sandstone with a small amount of calcium-carbonate cementing
Dimensions:	L = 73 mm W = 59.75 mm Th = 21 mm
Provenance:	L15 [3031] (surface)

⁵ The technical descriptions in this section were compiled from notes provided by Richard Hughes.

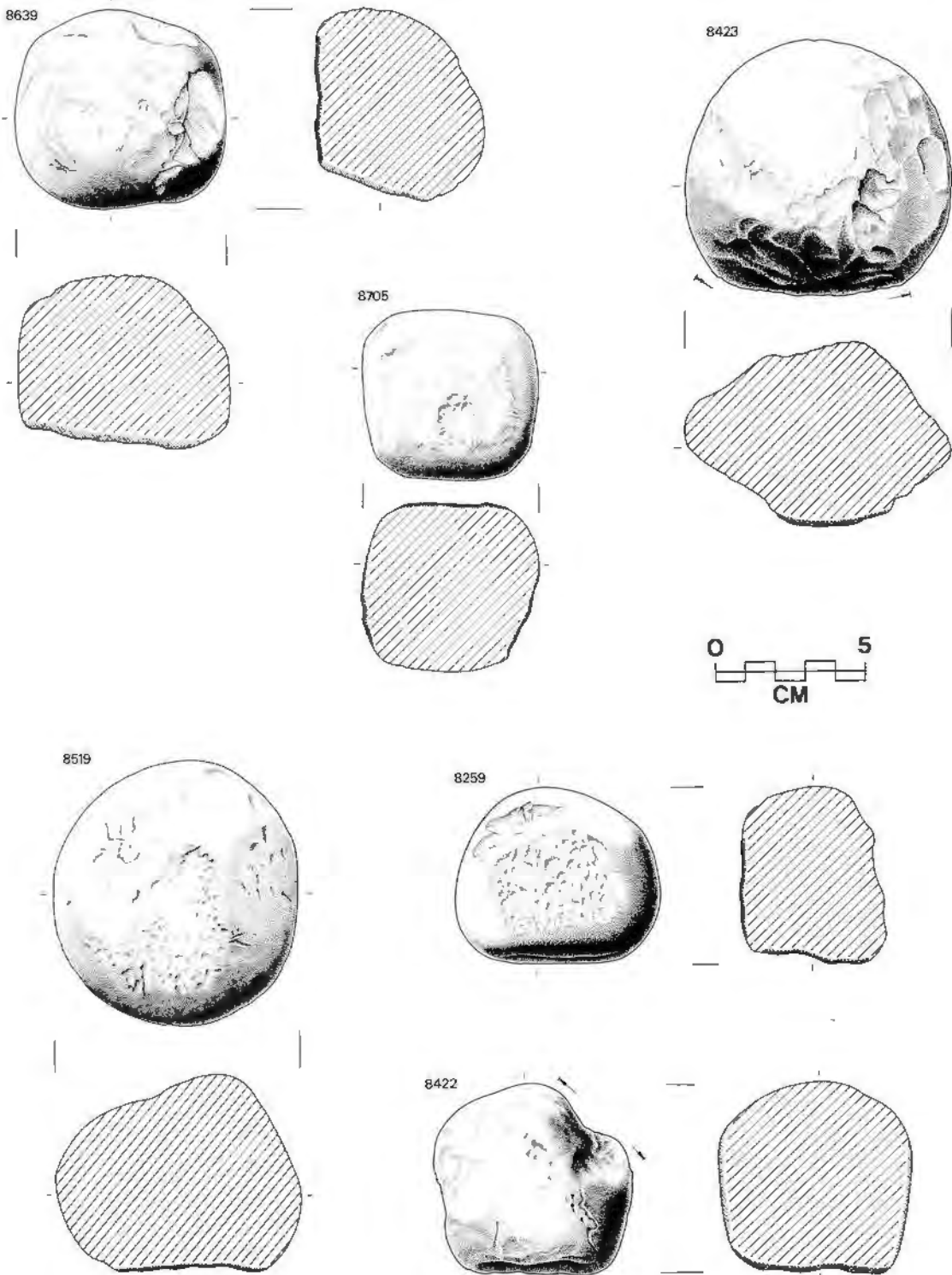


Figure 2.29. Hammer-stones from house P46.33. Scale 1:2. In the shaded section views, lighter shading indicates faces possibly used for a rubbing action, the heavier shading indicates possible percussion faces.

House P46.33: the finds

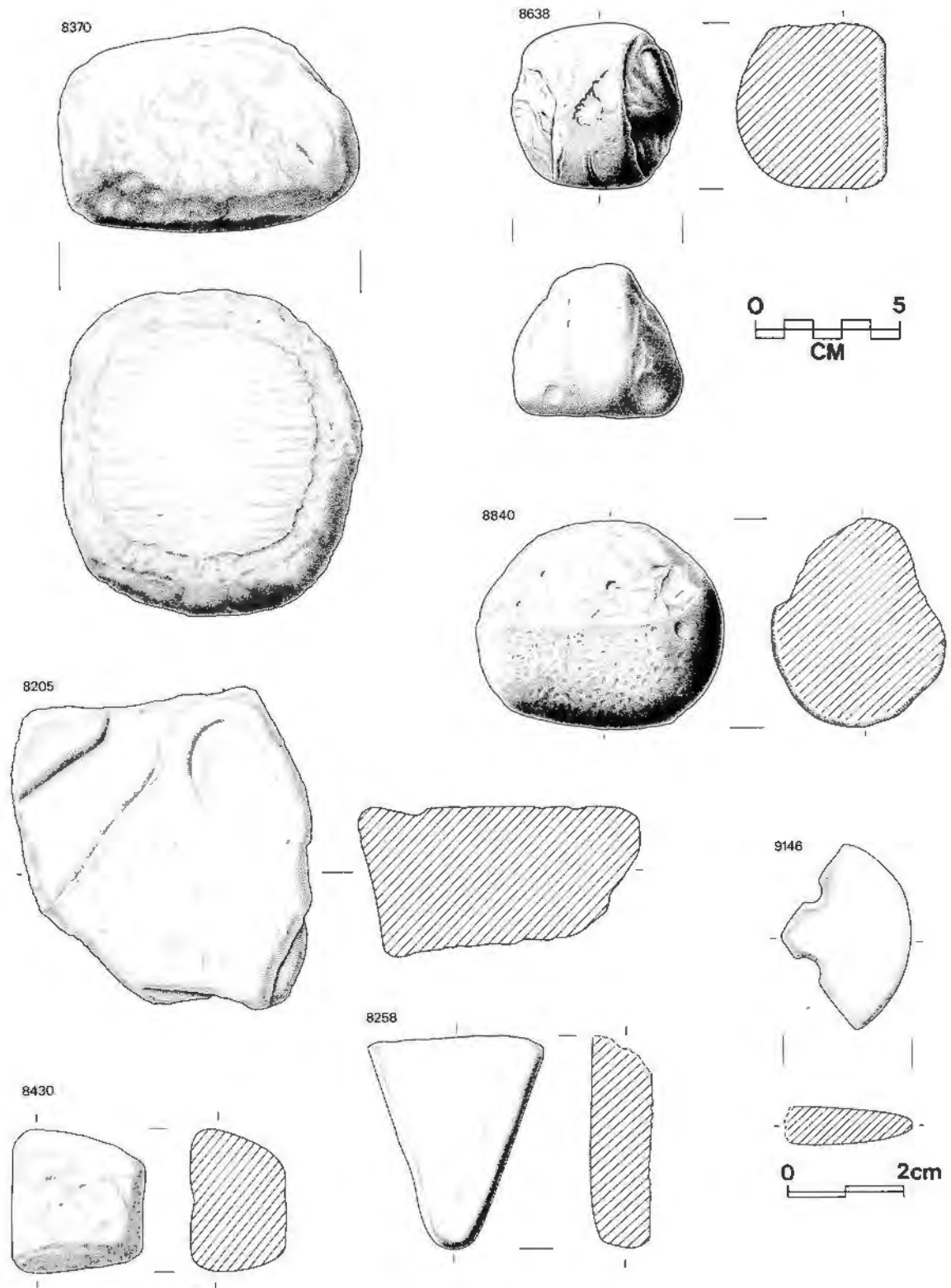


Figure 2.30. Stone tools and artefacts from house P46.33. All pieces drawn at 1:2 except for no. 9146 at 1:1.

Triangular-shaped stone, broken on the back face. Three faces have been used for honing. The underside (as drawn) is a natural bedding-plane.

8259 Rubber
 Material: Grey-green dolerite, with white veining
 Dimensions: L = 67.5 mm W = 59 mm Th = 51 mm weight = 344 g
 Provenance: L15 [3067] (room 4)

This stone preserves its natural shape, with two rough faces located at 90° to one another. Both faces show signs of wear from a rubbing action.



Figure 2.31. The worked surface of object 8370 showing signs of wear.

8370 ? Grindstone
 Material: Off-white, medium-grained hard sandstone
 Dimensions: L = 111 mm W = 103 mm Th = 70 mm weight = 10.81 g
 Provenance: L15 [3071] (room 11)

This piece probably preserves its natural shape. The only worked surface is marked with striations which all run in the same direction (Figure 2.31).

House P46.33: the finds

8422 Rubber/Hammer-stone
Material: Grey-black dolerite
Dimensions: L = 63 mm W = 63.5 mm Th = 65 mm weight = 425 g
Provenance: L15 [3072] (room 13)

The outline of the natural shape of this piece is preserved. There are three fracture faces where the stone has been used for a hammering action, with two surfaces at 90° to these which show evidence of a rubbing action.

8423 Hammer-stone
Material: Grey-black dolerite
Dimensions: L = 83 mm W = 88.5 mm Th = 62 mm weight = 681 g
Provenance: L15 [3186] (room 13)

The original outline of this stone has been modified by fracture faces on three sides. There is no evidence of a rubbing action having taken place, all faces show the results of a definite striking action. As illustrated, the "underside" is a flat area which has received the impact, causing the sides to flake away to leave a "faceted" effect.

8430 ? Rubber
Material: Medium grain, hard, fairly porous buff-coloured sandstone
Dimensions: L = 45.5 mm W = 49 mm Th = 32.5 mm
Provenance: L15 [3071] (room 11)

A rectangular form, shaped on all faces. There is a surface veneer of calcium carbonate acquired while in the soil.

8519 Rubber/Hammer stone
Material: Light green-grey dolerite
Dimensions: L = 90 mm W = 83 mm Th = 65 mm weight = 754 g
Provenance: L15 [3188] (room 13)

This stone preserves its natural shape. One face (the underside as illustrated) shows evidence of use for both hammering and polishing. The surface has some red staining which is natural in origin.

8638 Rubber
Material: Light green-grey dolerite
Dimensions: L = 84 mm W = 71 mm Th = 59 mm weight = 293 g
Provenance: L15 [3240] (room 4)

Two side faces of this stone have been chipped, presumably to create a shape that would fit comfortably in the hand. The lower face (as drawn) shows the marks from a rubbing and crushing action, with slightly polished facets. This appears to be the only worked face.

8639 Rubber/Hammer-stone
Material: Dark grey-black dolerite, with white veining
Dimensions: L = 70 mm W = 66 mm Th = 57 mm weight = 395 g
Provenance: L15 [3240] (room 4)

There are two worked faces on the underside of this object (as drawn). One of these shows evidence of hammering; the other appears to have been used for a rubbing action. On the upper surface, hollows may mark where percussion flakes have become detached.



Figure 2.32. Object 8705 showing the manufactured shape.

8705	Hammer-stone/Weight			
Material:	Light green-grey dolerite			
Dimensions:	L = 58 mm	W = 54 mm	Th = 56 mm	weight = 353 g
Provenance:	L15 [3239] (room 4)			

This piece has been shaped to form a cube, using a light “striking” action. There is no evidence that the shape was achieved using an abrasive technique. Damage on three faces shows where the piece has been used as a hammer-stone (Figure 2.32). This shape is typical of a larger form of Egyptian weight, which was frequently, as Petrie noted, also used as a pounder (Petrie 1926: 5, also Pl. III.4, 10). Similar weights are preserved in the Cairo Museum and had been made from a number of different stones, including basalt and possibly dolerite (Weigall 1908: forms R, S, particularly nos. 31330, 31327, and 31328).

8840	Grinder			
Material:	Dark brown chert			
Dimensions:	L = 85 mm	W = 70 mm	Th = 61.5 mm	weight = 491 g
Provenance:	K15 [3076] (room 2)			

This is probably a local rock, obtained as a nodule from the surrounding limestone cliffs. It can be visually distinguished from the dolerite tools by its different texture and brown colour. Two opposing surfaces appear to have been flaked (shown as the upper faces on the drawing, Figure 2.33), either to create a suitable shape for holding, or after use as a percussion surface. The



Figure 2.33. Object 8840 showing the contrasting upper and lower surfaces.

rough, pitted, lower surface may have been used for grinding, by means of a “rocking” or circular motion.

2.25 Stone furniture⁶

Five recognisable pieces of stone furniture were found in the area of house P46.33, parts of three different tables and two stools. Two unidentified fragments may be from similar pieces of furniture. The tables (one complete and two fragmentary) are of two different patterns (Figure 2.34). One type has not been recorded before at Amama. This type (b) has two supports running laterally under the table surface. The design of this table suggests that it is less capable of supporting weight than the more common design (a). This conclusion appears to be borne out by the fact that this example has broken through the centre. The other design (a) has two supports running the length of the table. The table top is further strengthened by two ribs running between the outer supports (as illustrated in *COA I*: 62, Fig. 7).

One near-complete stool was found. Its construction differs from the type illustrated in *COA I*: 62, Fig. 7 (also Pl. XIV. 6, 8), in that the main weight is not taken by the legs, but by the centre of the seat which rests on the ground.

All the pieces listed here use limestone which appears to have come from the local cliffs. This is an off-white medium-grain hard limestone containing some sand, with fossil worm-casts visible in the matrix. There is a notable lack of similar stone furniture recorded from earlier excavations

⁶ Technology notes for this section were provided by Richard Hughes.

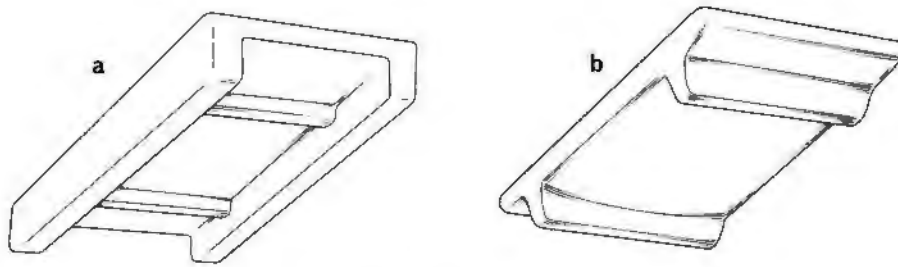


Figure 2.34. The two patterns of stone table found in house P46.33.

in the Main City. It is difficult to draw any conclusions on the subject without further controlled excavations here.

8801	Table fragment
Material:	Limestone
Dimensions:	L = 232 mm W = 138 mm H = 97 mm
Provenance:	KI5 [3685] (room 1)

Part of a low rectangular table, preserving approximately one-quarter of the original shape (Figure 2.37). The table is of pattern "a". The lower surface has been left rough and is covered with short tool marks running in a lateral direction. The inner face of the surviving area of support also shows numerous tool marks which cut diagonally across the surface. The outer face of the support and the table top are relatively smooth and undetailed.

8802	Stool
Material:	Limestone
Dimensions:	L = 267 mm W = 193 mm H = 80 mm
Provenance:	L15 [3304] (room 11)

A three-legged stool, complete except for one front leg having broken away (Figures 2.35, 2.38). The lower surface is coarsely chiselled, with the tool marks following the general outline of the seat. The legs are more finely chiselled. The upper surface has been more carefully worked to appear smoother, though it has not been polished. A smooth area in the centre of the seat recess may show wear from use.

8339/8373	Stone table
Material:	Limestone
Dimensions:	L = 537 mm W = 275 mm H = 96 mm
Provenance:	L15 [3229] (room 12)

A low table, broken into two halves (Figure 2.36). This table is of pattern (b). The underside of the table is coarsely chiselled to shape. The central section of the underside is slightly convex with tool marks running between the two lateral supports. The outer edges of the table are thinner and taper slightly. The tool marks here run parallel to the supports. The top has been smoothed and is undetailed. The broken edges of the two fragments are rounded, presumably due to the abrasion of the surrounding soil. If this can be taken to indicate an ancient break, then the presence of this broken furniture in room 12 may add weight to the argument that material found here is from a contemporary rubbish dump.



Figure 2.35. Three-quarter view of stool 8802 showing the contrasting finish on the upper and lower surfaces.

8371	Table fragment
Material:	Limestone
Dimensions:	L = 274 mm W = 180 mm H = 68 mm
Provenance:	L15 [3229] (room 12)

Part of a low rectangular table, of which approximately one-quarter remains (Figure 2.37). The table is of pattern (a). The lower surface is covered by chisel marks, the majority of which do not appear to travel in any one direction. Only where a feature occurs, such as a support or the table edge, do these marks show any consistency of alignment, usually at 90° to the feature. On the inner face of the surviving area of support, the chisel marks run diagonally across the surface. The outer face of the support and the table top are smoothed and undetailed. Fragments 8801 and 8371, although originating from the same type of table, are very different in outline, and are definitely not part of the same object.

8634	? Furniture fragment
Material:	Limestone
Dimensions:	L = 118 mm W = 130 mm Th = 35.5 mm
Provenance:	L15 [3239] (room 4)

Irregularly shaped fragment, preserving two opposing original faces, both of which show signs of working. One face is roughly chiselled, the other has been smoothed. Possibly part of a table. Not illustrated.

1987 excavation

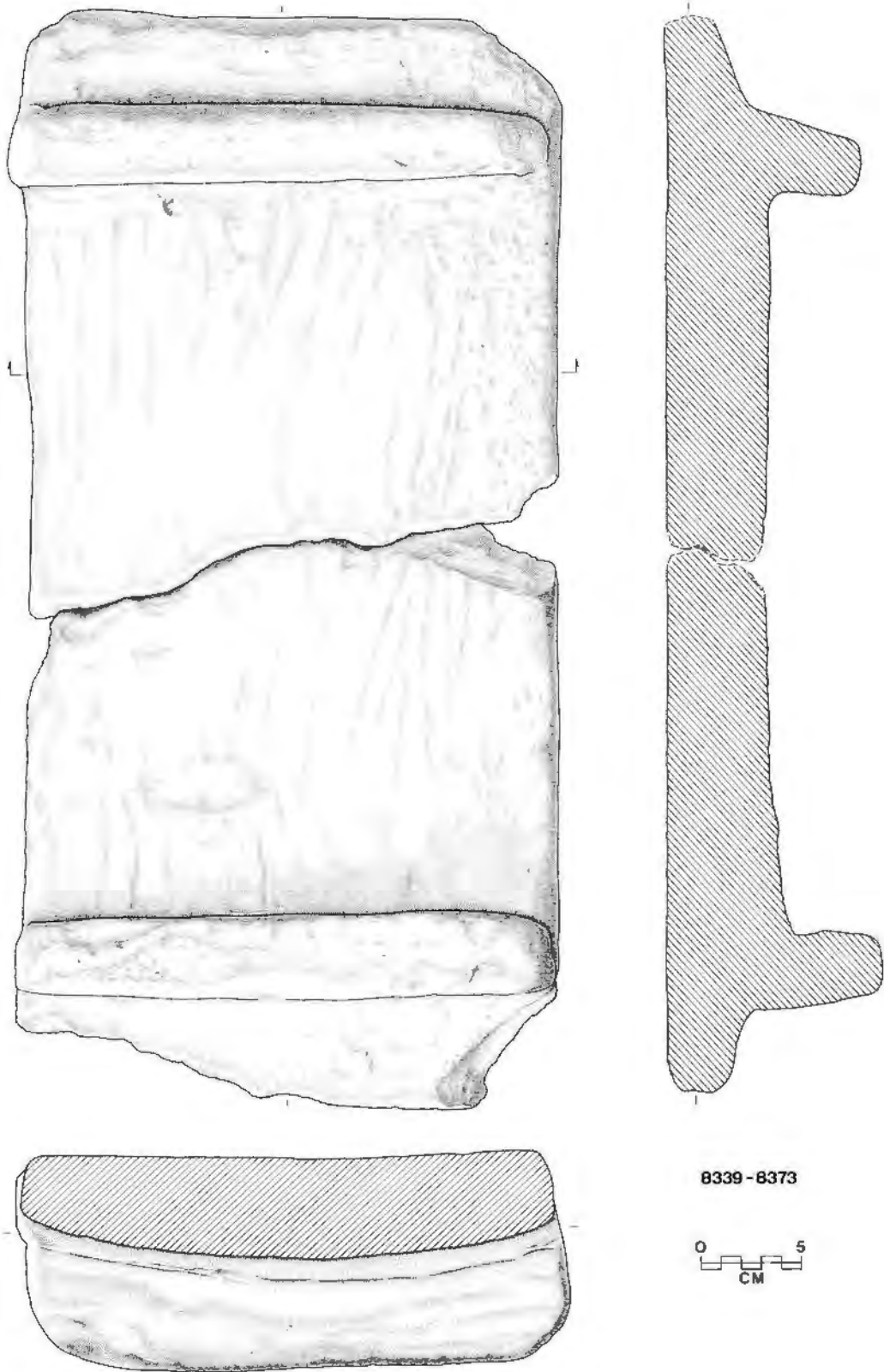


Figure 2.36. Stone table from house P46.33. Scale 1:3.

House P46.33: the finds

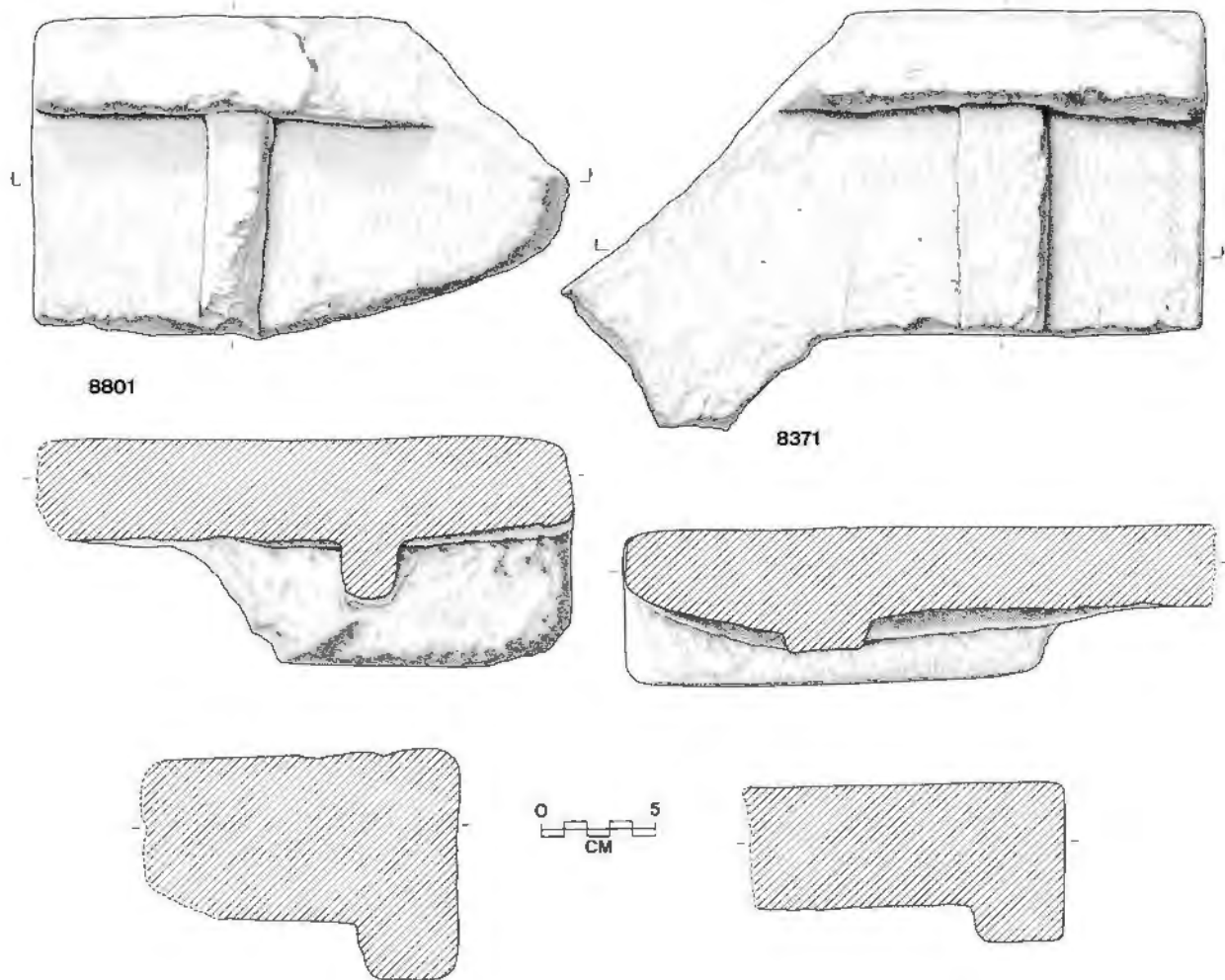


Figure 2.37. Stone table pieces from house P46.33. Scale 1:3.

8635 ? Furniture fragment
Material: Limestone
Dimensions: L = 72.5 mm W = 50.75 mm Th = 35 mm
Provenance: L15 [3239] (room 4)

Triangular piece from a worked stone object, preserving three original faces. All faces are smoothed. Possibly from a piece of furniture. Not illustrated.

8872 Stool fragment
Material: Limestone
Dimensions: L = 127 mm W = 98 mm H = 84 mm
Provenance: K15 [3338] (room 3)

Part of a three-legged stool, preserving the complete rear leg and a small area of the seat (Figure 2.38). The leg is round in section. The lower surface of the seat is covered in fine tool marks which run around the base of the leg. The upper face is undetailed. This stool appears to be of similar design to the example illustrated in *COA I*, where the legs support the whole weight.

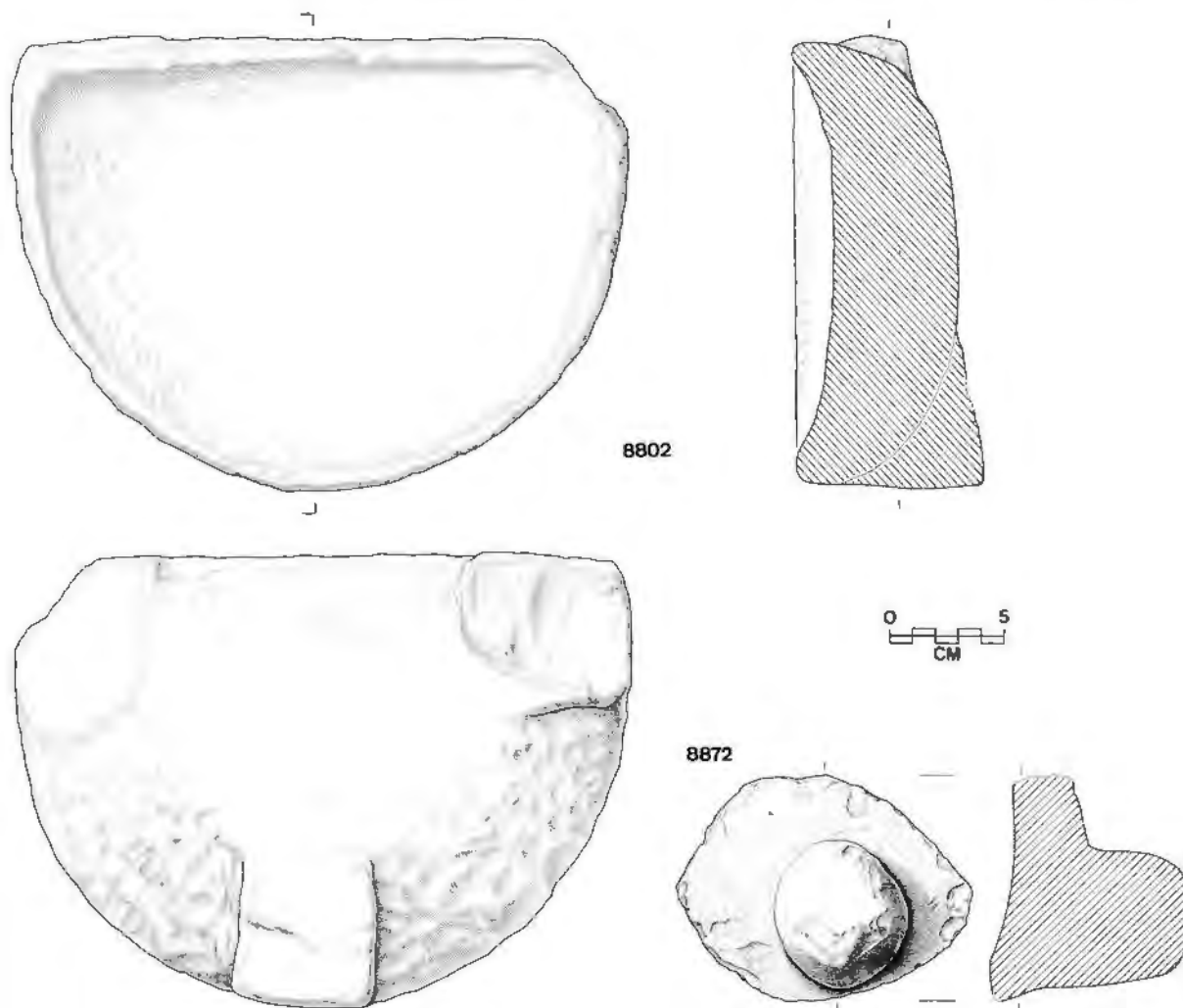


Figure 2.38. Stone stool and stool leg from house P46.33. Scale 1:3.

Whatever its original shape, the design of the surviving leg shows that it is of a different pattern to stool 8802.

2.26 Stone objects, miscellaneous and unidentified

8489	Block. Unknown function
Material:	Hard, coarse grained sandstone
Dimensions:	L = 124 mm W = 96 mm Th = 59 mm
Provenance:	L15 [3229] (room 12)

The composition of this stone appears, from visual inspection, to be a coarse sandstone with angular grains, mostly translucent-to-clear in colour. These are loosely packed with a haematite cementing. The haematite (or possibly illite) may be a replacement deposit for calcium carbonate. Only one worked surface remains, which has been abraded, perhaps to produce a red dye or stain (Figure 2.39). The surface shows slight traces of yellow and red pigment. The broken edges of this fragment may be relatively recent, as the polish on the worked surface extends to the

House P46.33: the finds

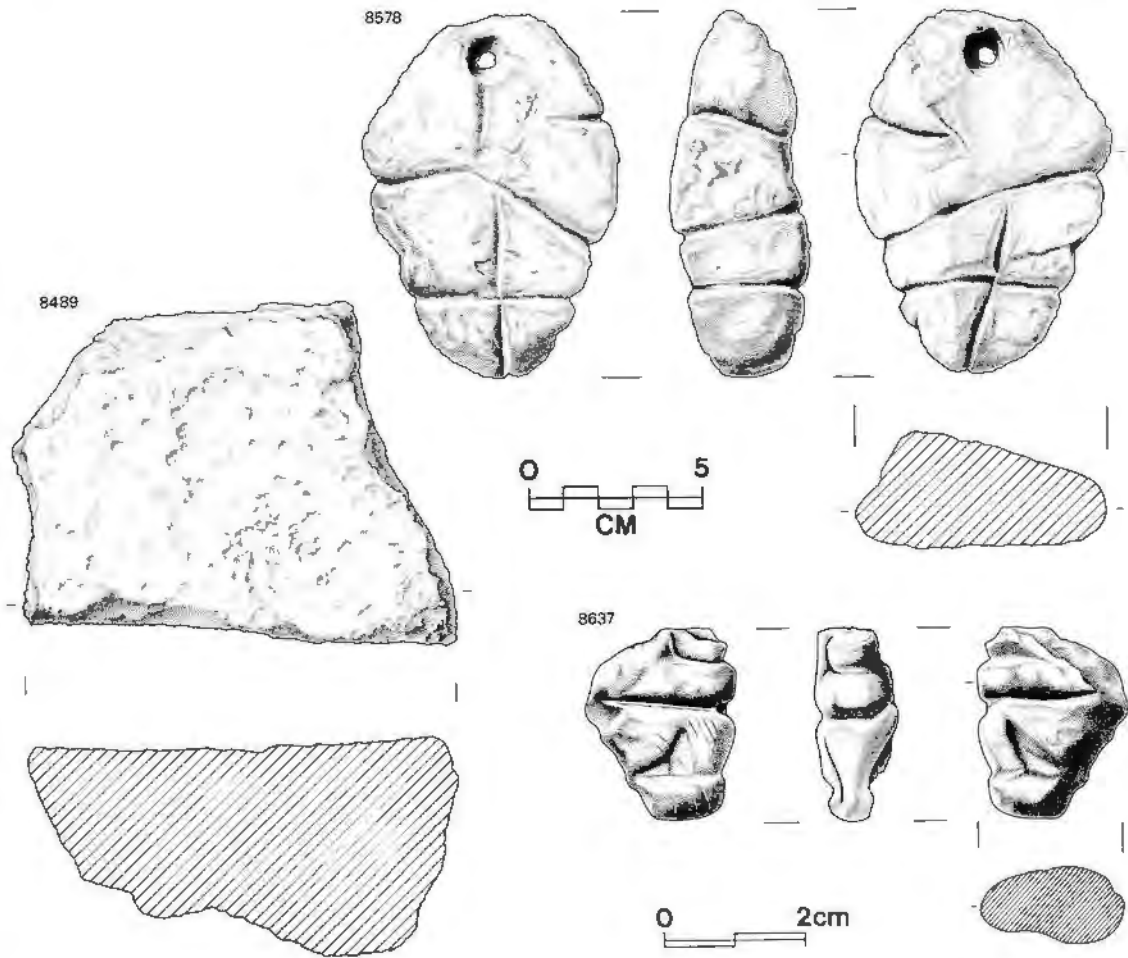


Figure 2.39. Unidentified stone objects from house P46.33. Nos. 8578 and 8489 at 1:2, no. 8637 at 1:1.

damaged edges, rather than being located in the centre of the face as one might expect if the piece was complete. Stone 8576 appears similar in composition.

8576	Two unworked fragments
Material:	Mainly fine grain, very friable sandstone
Dimensions:	a) L = 62 mm W = 32 mm Th = 23 mm b) L = 39 mm W = 24 mm Th = 13 mm
Provenance:	L15 [3185] (room 11)

A visual inspection suggests that these fragments are composed of fine-grained sand, loosely packed with a haematite cementing. The pieces can be crumbled to expose a red colour. No worked surfaces (if any were ever present) survive. The material is similar to find 8489. Not illustrated.

8578	? Weight
Material:	Soft-to-medium hard off-white limestone with some sand inclusions
Dimensions:	H = 103 mm W = 72.5 mm Th = 33 mm Weight = 211 g
Provenance:	L15 [3240] (room 4)

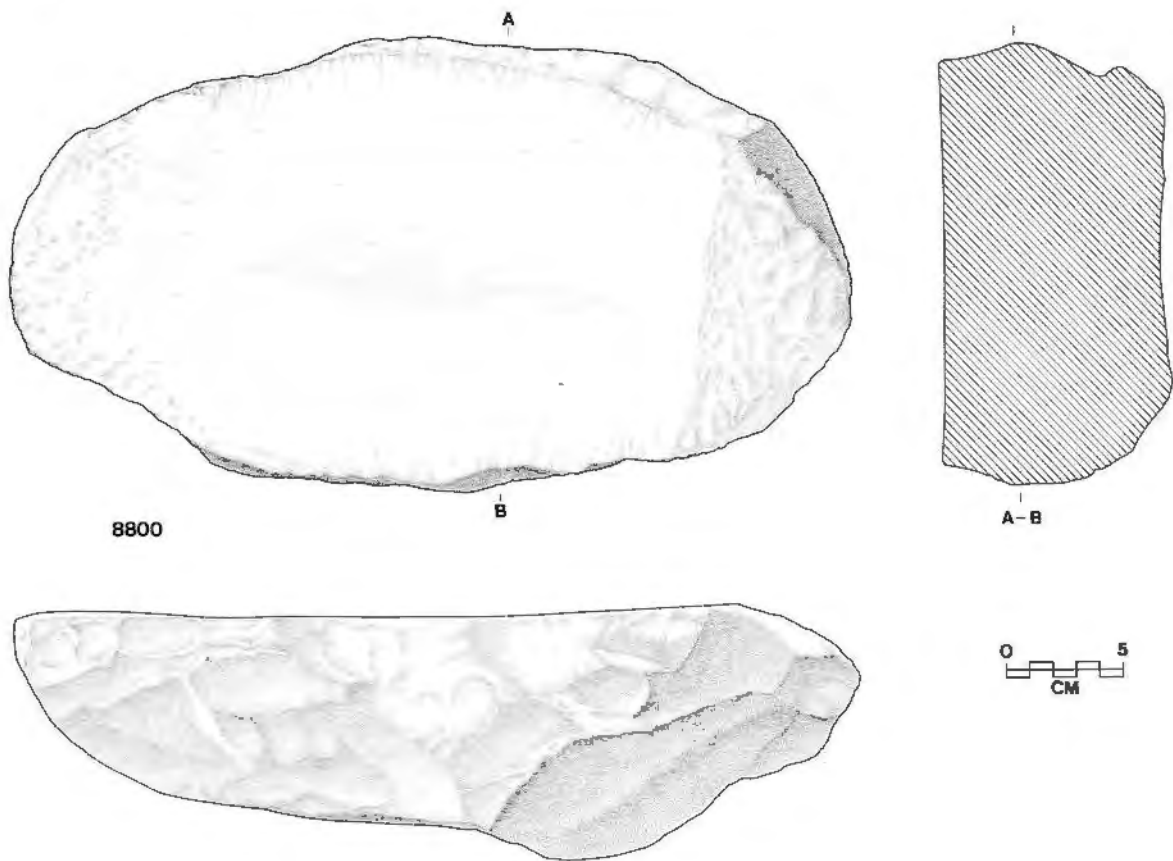


Figure 2.40. Grindstone 8800 from house P46.33. Scale 1:3.

House P46.33: the finds

Roughly shaped three-sided object, pierced at one end (Figure 2.39). A series of deep grooves cross the surface, perhaps showing the position of cords used to hold the object. Possibly this object was used as a weight or crude plumb-bob.

8637 ? Baboon statuette
Material: Off-white sandy limestone
Dimensions: H = 27 mm W = 21 mm Th = 11.5 mm
Provenance: K15 [3301] (surface find)

Part of a small carved object, of which three original faces survive (Figure 2.39). The carving on the two main faces is similar, and seems to depict a squatting baboon. There is damage to the (presumed) head and rear of the body. The piece is thought to be unfinished. Similar statuettes of baboons have been found from the recent Workmen's Village excavations and earlier Main City sites. Their exact purpose is unknown.

9146 Fragment. Pierced stone
Material: Soft, grey-brown calcareous mudstone
Dimensions: L = 31.5 mm W = 22 mm Th = 6.25 mm
Provenance: L16 [3900] (room 16)

Incomplete object, possibly one-quarter of a bi-convex disc. There are the remains of two holes drilled into the surface. The broken edges are rounded, a feature also noted on mudstone vessel base 8472. In both cases this is thought to be due to the abrasion of the surrounding soil. The purpose of this object is unknown, though the holes drilled into the body suggest the piece was designed to be suspended, in a similar fashion to the "spinning ring" illustrated from Qoseir el-Qadim (Eastwood 1984: 141). Two similar discs were found together in house R45.78 at Amarna during the 1923-4 season. They measured 6.9 and 7.3 cm, and were described as being "made of plaster", possibly a misidentification of calcareous mudstone. Both of the discs had two holes made through the body. On one of them a hole was filled with by the remains of a "hard wood pin". Not illustrated.

8800 Grindstone
Material: Very hard, off-white medium-grain limestone
Dimensions: L = 358 mm W = 192 mm H = 104 mm
Provenance: L15 [3305] (room 11)

This stone has been worked to form an elongated ellipsoid, large fractures being used to create the shape. The piece is thicker at one end than the other, presumably designed to be used in an inclined position. When placed on a flat surface, the stone will not rest upright, a fact suggesting that it was positioned within a purpose-built emplacement for use. The upper face is slightly concave when viewed from the side and in section. It is covered with fine striations which run the length of the surface. This suggests that grinding has taken place. The lower left side of the surface is slightly raised, so that ground material would fall to the right. As the stone is very hard, it seems unlikely that this is due to uneven wear. The surface texture is smooth, but not polished, and if used for grinding would produce a fine flour. (The notes for this object were provided by Richard Hughes and Delwen Samuel.)

2.27 The distribution of the finds

The ground plan of house P46.33 suggests that the site can be divided into three main areas. This division is generally confirmed by the distribution of finds (Figure 2.41).

The central area of the site is the house itself, rooms number 1-7, 10, and presumably room 9 (if we assume, after the blocking of the doorway to room 3, a connection via an interconnecting doorway with room 10 in the as yet unexcavated ground). An average of 1.5-2.3 finds per square metre was found in most rooms of the house. To the east lie rooms 11-14, probably workshops or outbuildings associated with the house. The greatest concentration of material was found here,

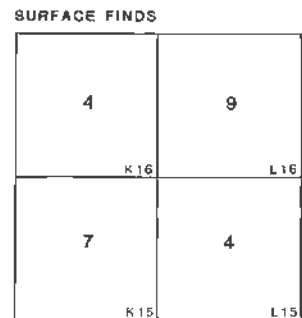
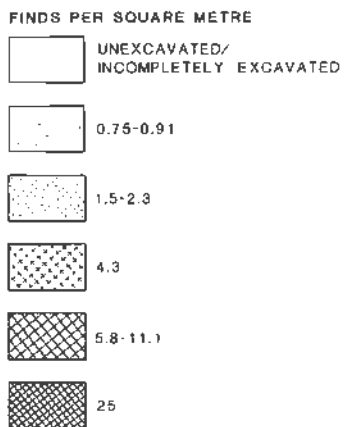


Figure 2.41. Diagram to show the density of finds of non-pottery artefacts.

House P46.33: the finds

particularly in rooms 11 and 12. To the north of the house are three further rooms or courtyards, numbers 15–17. Only room 15 was excavated to floor level (though leaving most of the rubbish pit in the north-east corner undug), producing a relatively low number of finds. This may indicate that no regular activity within the range detectable by archaeology took place here. Although the excavation of room 16 was incomplete, it produced a total of thirteen finds, a concentration of material similar to that found within the main house. If we use the concentrations of finds found within the excavated area as a guide, we might argue that room 16 was part of another house, or (bearing in mind the thinness of the walls, and that more objects might have been found) outbuildings similar to rooms 11–14. Rooms 8, 9, and 18 were not excavated.

The main exceptions to the pattern suggested here are rooms 4 and 6 in the main house (room 5 is actually the foot of the stairway). Room 6 has a lower concentration of finds than the surrounding rooms, which might reflect the use to which the room was put. The ground plan and the type of find from this room do not appear to be unusual, however, and it is possible that the low number of finds in this room is not significant. Room 4, by contrast, has a higher concentration of finds than the rest of the house. It is possible that some of the material found here was originally deposited in the outbuildings, rooms 11–14, as part of a rubbish dump, which was dispersed when the dividing wall collapsed (see, for further discussion, Chapter 4).⁷

It is difficult to find any pattern in the type of material found in each area. The majority of finds from house P46.33 are items of jewellery, mostly of faience. It seems likely that faience jewellery was being made nearby, possibly within the outbuilding area, rooms 11–14. In this part a large number of faience objects were found, along with firing errors and moulds (for which see the section of faience manufacture for further details). Rooms 11–14 also contained the majority of objects in metal, glass, and stone, including three stone table fragments which may well have been discarded during the occupancy of the house. It is, therefore, possible that the accumulation of objects in this area indicates only the presence of a rubbish dump.

The area produced relatively few finds which can be associated with domestic activity. A total of twenty-five pieces, including stone tools, furniture, a stone vessel, a bronze needle fragment, and a possible bronze blade might have had a domestic use, equally they might have had a more specialised industrial role. It is equally difficult to determine whether the faience jewellery found in the area was worn, or merely the remnants of a place of manufacture. Unusual firing marks on some pieces (for which see the section on faience manufacture) could suggest that the majority of pieces were made locally, perhaps by a single workshop.

If we compare the finds from house P46.33 with the records of finds from the houses published in the *City of Akhenaten* volumes, it can be seen that the number of pieces from the former appears to be quite large, and that several classes of material — most notably unidentifiable metal objects and stone tools — were rarely included in the earlier reports at all. This is almost certainly due to the greater care taken during the 1987 excavations to obtain as complete an artefactual record as possible, reflecting a greater awareness of the potential significance of more damaged or “mundane” finds which might lead to a clearer understanding of the activities which they represent. Comparison with houses excavated during the recent campaigns at the Workmen’s Village is perhaps premature, for much of this material has still to be studied in detail, but in general house P46.33 lacks artefacts of organic material, particularly of wood, which was relatively common at the Workmen’s Village.

Acknowledgements

I would like to thank the following individuals and museums for allowing me to draw and to publish pieces from their collections: The Museum of Archaeology and Anthropology of the University of Cambridge; Dr Helen Whitehouse and the Ashmolean Museum, Oxford; W.V. Davies and the Trustees of the British Museum, London; Dr Angela Thomas and the Bolton Museum and Art Gallery. A particular expression of thanks is due to Louise Shearman for undertaking the arduous task of typing text and tables. All of the line illustrations are by the author, the photographs by Gwylim Owen.

⁷ A faience ring mould was found in room 4. It is thought that this might have originated within rooms 11–14, which, with the exception of three pieces in room 16 (possibly part of a separate building), contained all the other pieces directly connected with the manufacture of faience.

Room no.	1	2	3	4	5	6	7	-	10	11	12	13	14	15	16	17	Findings totals
Faience firing errors	-	-	-	-	-	-	-	-	-	2	-	2	3	-	1	-	8
Faience moulds	-	-	-	1	-	-	-	-	-	-	3	-	-	-	2	-	6
Faience pendants	3	-	1	-	-	1	7	-	3	1	1	2	-	-	1	1	21
Faience rings	-	-	5	1	-	-	2	-	2	8	-	1	2	2	-	-	23
Earrings	-	-	2	-	-	-	-	-	-	-	-	1	1	-	-	-	4
Faience beads	5	-	4	1	-	2	1	-	1	29	68	16	13	3	7	1	151
Glass beads	-	-	2	1	-	-	1	-	-	1	-	2	2	-	-	-	9
Stone jewellery	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	2
Tiles and inlays	1	-	4	-	-	-	1	-	1	2	3	1	3	1	-	-	17
Decorative elements	-	-	-	1	-	-	-	-	1	-	1	1	-	-	-	-	4
Miscellaneous faience	2	1	1	-	-	-	-	-	-	-	-	-	1	-	-	-	5
Glass rod and strip	1	-	-	-	-	1	-	-	-	1	-	-	1	1	-	-	5
Metal	-	1	2	-	-	-	-	-	-	2	2	2	4	-	-	-	13
Mud and pottery	-	1	3	-	-	-	-	-	-	-	-	-	-	1	-	-	5
Vessels	1	1	1	-	-	-	-	-	-	1	-	-	1	1	-	-	6
Stone tools	-	1	-	4	-	-	-	-	-	3	-	3	-	-	-	-	11
Stone furniture	1	-	1	2	-	-	-	-	-	1	2	-	-	-	-	-	7
Miscellaneous stone	-	-	-	1	-	-	-	-	-	1	1	-	-	-	1	-	4
Room totals	14	5	26	13	0	4	12		8	52	81	31	32	9	12	2	301

Table 2.5. General distribution of finds at house P46.33.

Bead type	no.	prov.	room	glaze	Pantone	width/ diameter	l.	th.	comments
5 x R4	8289	L15 [3069]	11	Copper-blue	321U 313U	1.75-2	-	0.75	Random pattern. "Stick" marks where group rested flat during firing.
1 x Cy4	8451	L15 [3227]	13	Cobalt-blue	293U/ 294U	4.25	-	3	One end of bead has flattened and spread where it rested during firing. Dark brown (? burnt) underside.
1 + 1/2 x R4	8453	L15 [5227]	13	Copper-blue	319U/ 320U	1.75	-	0.75	-
1 + 1/2 x R1	8475	L15 [3185]	11	Yellow ochre	120U/ 128U	4.5	-	1.25	Sand/quartz particles in glaze.
2 x S1	5485	L15 [3226]	13	Cobalt-blue	302U/ 542U	{ 2.25 2.25	2.5 3.25		} Two segmented beads, one of 2 segments, one of 3 attached side by side. "Stick" marks where they rested during firing.
3 x R4	9077	L16 [3751]	14	Copper-blue	312U/ 908U	2	-	0.75	- 1 Random pattern.
3 x R4	9139	L16 [3754]	16	Damaged	-	2	-	0.75	-
2 x R4	9147	L16 [3893]	14	Copper-blue	313U/ 320U	{ 1.75 1.75	-	1 0.5	} Two ring beads, attached by their edges at 90° to one another.
1 + 1/4 x R4	9152	L16 [3901]	-	Copper-blue	298U/ 311U	1.75	-	1	Found during cleaning.
4 + 1/2 x R4	9692	L15 [3189]	14	Copper-blue	-	2	-	1	-

Table 2.6. Bead groups occurring as firing errors in the area of house P46.33.

Pantone	Munsell	description	Pantone	Munsell	description
287U	6.2PB 3.6/9.1	Dark blue	314U	-	Mid blue-green
288U	-	Dark blue	315U	-	Dark blue-green
294U	4.3PB 3.7/7.2	Dark blue	318U	0.9B 7.8/5.8	Light blue-green
298U	1.1PB 6.2/8.8	Light-mid blue	319U	0.7B 7.0/7.4	Light blue-green
300U	3.6PB 4.7/10.7	Mid-blue	320U	-	Mid blue-green
301U	-	Mid-dark blue	321U	-	Mid blue-green
304U	2.7PB 8.0/4.2	Light blue	322U	-	Dark blue-green
305U	5.6B 7.1/7.6	Light blue	324U	-	Light blue-green
306U	7.1B 6.5/9.0	Light-mid blue	325U	6.2BG 6.1/7.6	Mid blue-green
Process blue	9.6B 5.3/10.7	Mid-blue	326U	5.0BG 6.1/7.6	Mid blue-green
307U	8.3B 4.8/8.6	Mid-dark blue	327U	9.0BG 5.3/7.5	Mid blue-green
308U	-	Mid-dark blue	337U	8.8G 7.8/4.7	Light green
310U	3.7B 7.3/6.9	Light blue			
311U	4.3B 6.7/8.1	Light blue			
312U	5.0B 6.0/9.0	Light-mid blue			
313U	5.4B 5.2/9.0	Light-mid blue			

Table 2.7. Faience glazes at house P46.33: copper-blue.

Cobalt-blue			Yellow ochre		
Pantone	Munsell	description	Pantone	Munsell	description
272U	-	Light purple-blue	115U	-	Mid yellow ochre
280U	6.6PB 3.5/7.7	Dark blue	116U	-	Yellow-orange
281U	-	Blue-black	120U	3.6Y 8.4/7.8	Mid yellow ochre
282U	-	Dark blue-grey	121U	1.2Y 8.1/9.3	Mid yellow ochre
294U	4.3PB 3.7/7.2	Mid blue-grey	127U	5.2Y 8.4/6.8	Light yellow ochre
296U	-	Blue-black	128U	3.8Y 8.2/8.0	Light yellow ochre
301U	-	Dark blue-grey	129U	0.1R 7.6/9.5	Dark yellow ochre
302U	-	Blue-black	135U	0.1Y 8.3/6.7	Pale orange
534U	-	Grey-blue			
540U	-	Blue-black			
541U	-	Dark blue-grey			
542U	-	Light blue-grey			
543U	-	Light blue-grey			
549U	-	Light blue-grey			

Table 2.8. Faience glazes at house P46.33: cobalt-blue and yellow ochre.

Red-brown			Light green		
Pantone	Munsell	description	Pantone	Munsell	description
484U	8.0R 4.3/5.9	Dark red-brown	326U	5.0BG 6.1/7.6	Mid-green
485U	-	Dark red	338U	8.5G 7.0/6.9	Light green
			339U	7.6G 6.1/8.0	Mid-green
			362U	-	Dark green
			367U	--	Light green
			368U	-	Mid-green
			383U	--	Green-brown
			457U	-	Brown-green
			458U	-	Light brown-green
			570U	-	Mid green-blue

Note: all red glazes are 484U or a combination of 484U/485U

Table 2.9. Faience glazes at house P46.33: red-brown and light green.

Part	fraction	no.	prov.	room	glaze	Pantone	l.	w.	th.	shank l.	comments
C	1/3	8456	L15 [3227]	13	Copper-blue	307U	10	5	2	-	Thick glaze. Unglazed area at rear of bezel.
R	1/6	8474(a)	L15 [3185]	11	Copper-blue	312U/ 318U	7.25	6	2.75	13.25	Darker ringshank.
C	1/3	8531	K16 [3032]	10	Copper-blue	313U	10.5	11.5	2.75	-	
L	1/2	8580	K16 [3301]	-	Copper-blue	No equi- valent	1.3	1.1	0.6	-	Surface find.
R	1/2	8735	K15 [3324]	3	lost	-	10.5	10	2	13.75	
R	1/6	8736	K15 [3324]	3	Copper-blue	319U/ 320U	4.25	6.75	2.75	21	
L	1/2	8597	K16 [3349]	3	Copper-blue	319U	12	10	2.25	13.75	
complete	-	9023	L16 [3749]	7	Copper-blue	Process /307U	22	12	2	14.25 (max)	
R	1/6	9027	L16 [3335]	15	Copper-blue	337U	4	6.5	6.75	lost	
R	1/4	9072	L16 [3751]	14	Copper-blue	300U/ 344U	4.5	9	2	8.75	Rear of bezel + ringshank darker blue - well fired thick glaze, darker areas in bezel glaze.
C	1/3	9150	L16 [3901]	-	Copper-blue	313U	8.5	8.5	1	-	Found during cleaning.

Table 2.10. Table of *Wedjat*-eyes.

No.	prov.	room	glaze	Pantone	l.	w.	section th.	comments
8053	K16 [3030]	-	Copper-blue	-	8	6	2.75	Surface find. Ringshank widens to meet bezel.
8090a	L15 [3031]	-	Copper-blue	damaged	16	4.75	2.5	Surface find.
8090b	L15 [3031]	-	Copper-blue	311U	9	3	1.5	Surface find. Unusually thick ringshank, possibly part of a "small ring".
8279a	L15 [3069]	11	Copper-blue	damaged	9	4	3	
8279b	L15 [3069]	11	Copper-blue	damaged	7.5	5	2.5	White-green core.
8279c	L15 [3069]	11	-	lost	9	-	2.25	Small fragment, probably from a ringshank.
8385	K16 [3181]	10	Cobalt-blue	534U	10.75	3	2.25	Cobalt blue coloured body material.
8474b	L15 [3185]	11	Copper-blue	mottled glaze	8.5	3	2.75	A piece of a <i>Wedjat</i> -bezel found in the same context.
8581	K15 [3301]	-	Copper-blue	312U/320/U	11	4.25	2.25	Surface find.
8657	L15 [3240]	4	Copper-blue	319U	9.75	4	2.25	
8859a	K15 [3349]	3	Copper-blue	discoloured	6	3	3	} Probably the same ring. } No join.
8859b	K15 [3349]	3	Copper-blue	discoloured	8	3	3	
9137	L16 [3755]	15	Copper-blue	311U/312U	11	7	2.75	Light white-green core. Glaze 0.25 mm thick. Widens to bezel.
9148	L16 [3893]	14	Copper-blue	damaged	14	3	2	
9151	L16 [3901]	-	Copper-blue	306U/312U	11	5.5	2.5	Found during cleaning.

Table 2.11. Ringshank pieces.

No.	prov.	room	glaze	Pantone	l.	w.	bead dia.	comments
8271	L15 [3068]	14	Cobalt-blue	540U/541U	8	2.75	2.75	Illustrated.
8396a	L15 [3230]	12	Copper-blue	damaged	8	2.5	2.75	Unglazed body material adheres to one end.
8396b	L15 [3230]	12	Copper-blue	326U/549U	6.75	3	2	
8396c	L15 [3230]	12	Copper-blue	326U/549U	7.25	2.5	2.25	
8396d	L15 [3230]	12	Copper-blue	314U/549U	7.25	2.25	2.25	Unglazed body material adheres to one side.
8396e	L15 [3230]	12	Copper-blue	307U/308U	7	3	2.25	Glaze thin on one side.
8396f	L15 [3230]	12	Copper-blue	321U/549U	8	2.5	2.25	
8479d	L15 [3185]	11	Copper-blue	no equivalent	4.25	2.75	2.25	One segment lost.
9141	L16 [3754]	16	Copper-blue	304U/305U	7.75	2.75	2.75	

Table 2.12. Multiple bead spacers.

Type	no.	prov.	room	glaze	Pantone	th.	dia.	comments
DB1	8091	L15 [3031]	-	Copper-blue	damaged	0.5	5	Surface find
DB1	8281a	L15 [3069]	11	Copper-blue	310U/ 311U	0.25	14	Approximately 20% survives. Unusually thin section. Diameter approximate.
DB1	8281b	L15 [3069]	11	Copper-blue	thinly glazed	0.5	6.75	Large irregularly shaped aperture. Unglazed body material adheres to glaze.
DB1	8251c	L15 [3069]	11	Copper-blue	matted glaze	0.5	6	
DB1	8281d	L15 [3069]	11	Copper-blue	overfired	0.5	6.75	One surface brown and pitted, traces of glaze on the other.
DB1	8408a	L15 [3230]	12	Copper-blue	damaged	0.5	6.5	
DB1	8408b	L15 [3230]	12	Copper-blue	319U/ 320U	0.75	6	
DB1	8408c	L15 [3230]	12	Copper-blue	318U/ 319U	0.5	5	
DB1	8408d	L15 [3230]	12	Copper-blue	319U/ 326U	0.75	6	
DB1	8408e	L15 [3230]	12	Copper-blue	320U/ 327U	0.75	6	Unglazed body material adheres to glaze.
DB1	8408f	L15 [3230]	12	Copper-blue	mottled colouring	0.75	6	
DB1	8408g	L15 [3230]	12	Copper-blue	320U/ 327U	0.5	6	
DB1	8408h	L15 [3230]	12	Copper-blue	mottled colouring	0.75	5.5	
DB1	8408i	L15 [3230]	12	Copper-blue	mottled colouring	0.75	6	
DB1	8408j	L15 [3230]	12	Copper-blue	318U/ 319U	0.75	6	Irregular shape. Unglazed body material adheres to glaze.
DB1	8408k	L15 [3230]	12	Copper-blue	325U/ 319U	0.75	6	50% of surface unglazed.
DB1	8408l	L15 [3230]	12	unknown	glaze lost	0.75	6.75	Approximately 30% survives. Diameter approximate.
DB1	8408m	L15 [3230]	12	unknown	glaze lost	0.5	7.5	Irregular outline.

DB1	8408n	L15 [3230]	12	unknown	glaze lost	0.5	6	Approximately 50% survives.
DB1	8481a	L15 [3185]	11	Copper-blue	damaged	0.5	3.5	
DB1	8481b	L15 [3185]	11	Copper-blue	damaged	0.5	6	Concave in section. Unglazed round central aperture.
DB1	8513a	L15 [3229]	12	Copper-blue	324U/ 325U	0.5	5	Irregularly shaped central aperture. Unglazed areas on bead surface.
DB1	8513b	L15 [3229]	12	Copper-blue	326U/ 327U	0.75	5.75	
DB1	8513c	L15 [3229]	12	Copper-blue	damaged	0.75	7	Unglazed body material adheres to glaze.
DB1	8513d	L15 [3229]	12	Copper-blue	325U/ 326U	0.75	5.75	Unglazed body material adheres to one side.
DB1	8513e	L15 [3229]	12	Copper-blue	312U/ 313U	1	5	Unglazed body material adheres to one side.
DB1	8560	L15 [3072]	13	Copper-blue	damaged	0.5	7	Approximately 50% of bead remains. Unglazed body material adheres to one side.
DB1	8582a	K15 [3301]	–	Copper-blue	301U	0.5	6.5	Surface find. Glaze damaged.
DB1	8582b	K15 [3301]	–	Copper-blue	324U/ 325U	0.75	5.25	Distorted shape, small area missing from rim. Unglazed body material adheres to bead surface.
DB1	8614a	K16 [3171]	6	Copper-blue	319U	0.75	8.5	
DB1	8614b	K16 [3171]	6	Copper-blue	318U/ 319U	0.5	5.25	
DB1	8284e	L15 [3069]	11	Copper-blue	damaged	0.75	5	Irregular shape.
DB1	9026	L16 [3749]	7	Copper-blue	damaged	0.75	7.5?	Distorted shape, the exact diameter cannot be obtained.
DB1	9136a	L16 [3755]	15	Copper-blue	damaged	0.5	5.5	Unglazed areas on surface.
DB1	9136b	L16 [3755]	15	Copper-blue	damaged	0.5	4.75	

Table 2.13. Disc beads.

Type	no.	prov.	room	glaze	Pantone	th.	dia.	comments
R1	8409a	L15 [3230]	12	lost	-	0.5	2	
R1	8409b	L15 [3230]	12	Copper-blue	314U/ 300U	0.75	2	
R1	8409c	L15 [3230]	12	Copper-blue	318U/ 326U	1	4.25	
R1	8409d	L15 [3230]	12	Copper-blue	318U/ 325U	1.25	4.5	
R1	8409e	L15 [3230]	12	Copper-blue	319U/ 326U	1.25	4	
R1	8409f	L15 [3230]	12	Copper-blue	325U/ 326U	1	4.5	
R1	8409g	L15 [3230]	12	Yellow ochre	114U/ 115U	1.5	5	Stick marks and unglazed body material on glaze surface.
R1	8409h	L15 [3230]	12	Buff/white	468U	0.75	4.5	
R1	8409i	L15 [3230]	12	Dark cobalt-blue	282U	0.75	4.5	
R1	8514	L15 [3229]	12	Copper-blue	325U/ 326U	1.25	4.5	"Stick" marks down one side.
R1	9066	L16 [3752]	-	Yellow ochre	128U/ 129U	1	4	Found during cleaning. Well glazed central passage. Irregular outline.
R1	9070a	L16 [3751]	14	Dark cobalt-blue	302U	1.5	4.25	Matted glaze along one side.
R2	8283	L15 [3069]	11	Dark cobalt-blue	296U	3.5	6	Dark, almost black glaze. Unglazed central channel.
R3	9140	L16 [3754]	16	Copper-blue	300U/ Process blue U	1.5	6	75% of outer rim unglazed, as is central channel. (Handling before firing may have removed the glaze.)
R4	8272	L15 [3068]	14	Copper-blue	326U	0.75	2	Threading passage off centre. Glaze of uneven thickness.
R4	8284a	L15 [3069]	11	Copper-blue	314U	0.75	2.25	
R4	8284b	L15 [3069]	11	Copper-blue	313U/ 320U	0.75	2.25	
R4	8284c	L15 [3069]	11	Copper-blue	312U/ 319U	1	2	
R4	8284d	L15 [3069]	11	Copper-blue	314U/ 315U	1.25	3	

R4	8452a	L15 [3227]	13	Copper-blue	319U/ 320U	0.75	1.75
R4	8452b	L15 [3227]	13	Copper-blue	319U/ 320U	0.75	1.75
R4	8452c	L15 [3227]	13	Copper-blue	319U/ 320U	0.75	2
R4	8452d	L15 [3227]	13	Copper-blue	319U/ 320U	1	2
R4	8452e	L15 [3227]	13	Copper-blue	319U/ 320U	0.75	1.75
R4	8452f	L15 [3227]	13	Copper-blue	319U/ 320U	1	2
R4	8477a	L15 [3185]	11	Copper-blue	325U/ 326U	0.75	2
R4	8477b	L15 [3185]	11	Copper-blue	324U/ 325U	1	2
R4	8477c	L15 [3185]	11	Copper-blue	324U/ 325U	1	2
R4	8477d	L15 [3185]	11	Copper-blue	324U/ 325U	1.75	2.5
R4	8477e	L15 [3185]	11	Copper-blue	325U	0.75	1.75
R4	8477f	L15 [3185]	11	Copper-blue	325U	1	2
R4	8477g	L15 [3185]	11	Copper-blue	325U	0.75	1.75
R4	8477h	L15 [3185]	11	Copper-blue	damaged	0.5	1.75
R4	8486	L15 [3226]	13	Copper-blue	311U/ 322U	1	2
R4	8586a	L15 [3229]	4	Copper-blue	318U	1	1.75
R4	8586b	L15 [3229]	4	Copper-blue	319U/ 320U	1	2
R4	9220	L15 [3188]	13	Unknown	discoloured	1	2
R6	9070b	L16 [3751]	14	Cobalt-blue	damaged	1.5	3.25

Raised rim around central aperture each side. May have been cut from a shaped length similar to segmented bead type (S2).

Table 2.14. Ring beads.

Type	no.	prov.	room	glaze	Pantone	l.	dia.	comments
Cy1	8291	K16 [3066]	17	Copper-blue	306U/ 312U	4	3.5	Unglazed area along one side of bead. Area around one aperture unglazed. Body material discoloured. brown.
Cy1	8401a	L15 [3230]	12	Copper-blue	319U	2.75	2.75	
Cy1	8414	L15 [3230]	12	Copper-blue	318U/ 319U	7	3	Central channel blocked, rendering it unusable.
Cy1	8512a	L15 [3229]	12	Cobalt-blue	mottled	3.75	2.75	Centre of cylinder narrows slightly. glaze
Cy1	8512b	L15 [3229]	12	Cobalt-blue	mottled glaze	3.25	3	
Cy1	8512c	L15 [3229]	12	Copper-blue	Process blue U/ 307U	3.25	2	
Cy1	8559a	L15 [3072]	13	Copper-blue	318U/ 319U	3.25	3	Unglazed area along one side, grains of sand/quartz on opposite face, probably traces of glazing and firing processes.
Cy1	8559b	L15 [3072]	13	Copper-blue	311U	3.75	3.5	Half unglazed.
Cy5	8455	L15 [3227]	13	Copper-blue	319U/ 325U	6	2.25	One end flattened slightly during cutting.
Cy5	8480	L15 [3185]	11	Copper-blue	319U/ 325U	6	2.25	Similar to 8455
Cy5	8495	L15 [3226]	13	Copper-blue	Process blue U	15	4	Fragment. Appears similar to 8515. Green-white core.
Cy5	8515	L15 [3229]	12	Copper-blue	313U	31	4.5	Uneven outline, rounded ends. Small 0.5mm aperture. Roughly circular. Green mottled effect in glaze.
Cy5	9149	L16 [3893]	14	Copper-blue	damaged	12	4.75	Fragment. Reconstructed diameter. Appears similar to 8515.

Table 2.15. Cylinder beads.

Type	no.	prov.	room	glaze	Pantone	l.	dia.	no. of segments	comments
S2	8287	L15 [3069]	11	Copper-blue	306U	2.75	4.5	2	One end flattened before firing. Trace of sand/quartz at both ends.
S2	8397b	L15 [3230]	12	Copper-blue	306U/ 314U	5.75	3.25	3	Rim around one aperture. Sand/quartz along one side.
S2	8397c	L15 [3230]	12	Copper-blue	301U	6	4	4?	One end block and flattened before firing. Unglazed areas on surface.
S2	8397e	L15 [3230]	12	Copper-blue	307U	4	4	2	Rim around one aperture. Sand/quartz along one side. Rough unglazed area around one aperture, and along one side.
S2	8479b	L15 [3185]	11	Copper-blue	-	2	1.5	2	Too small to record colour. One end flattened before firing.
S2	8479c	L15 [3185]	11	Copper-blue	-	2.25	1.5	2	Too small to record colour. One end flattened before firing.
S2	8510a	L15 [3229]	12	Copper-blue	-	2	1.5	2	Too small to record colour.
S2	8510b	L15 [3229]	12	Copper-blue	Process blue U/ 307U	5	3.5	3	"Stick" marks down one side.
S2	8510c	L15 [3229]	12	Copper-blue	Process blue U	4	2.75	2	One segment smaller than the other. Unglazed area around one aperture.
S2	8510d	L15 [3229]	12	Copper-blue	311U/ Process Blue U	3	4.5	2	"Stick" marks down two opposing sides.
S2	8510e	L15 [3229]	12	Copper-blue	309U	4	4.5	3	One end partly lost before firing. "Stick" marks down one side.
S2	9043	K15 [3748]	-	Copper-blue	-	1.5	1.75	2	Found during cleaning. Too small to record colour.
S2	9074a	L16 [3751]	14	Cobalt-blue	293U	3.25	5.25	3	Thin segments, large aperture. "Stick" marks at one end.
S2	9074b	L16 [3751]	14	damaged	-	9.5	4.5	6	
S2	9138a	L16 [3754]	16	Copper-blue	318U/ 319U	4.75	3.5	3	"Stick" marks down one side.
S2	9138b	L16 [3754]	16	Copper-blue	318U/ 324U	6	3.5	4	Part of one end lost before firing.
S2	9138c	L16 [3754]	16	Copper-blue	Process blue U	4.5	3	2	Unglazed areas at one end and down one side.
S2	9146	L16 [3893]	14	Copper-blue	Process blue U	3.75	2.5	2	Irregularly shaped. Unglazed area down one side. Aperture "off-centre".

S2	9177	L16 [3900]	16	Copper-blue	307U	4	4	2	Unglazed area down one side. Central channel unglazed.
S2	9217	L15 [3078]	14	Pea-green	No equivalent	4.5	2	4	Part of another segmented bead attached to one side.
S2	9219	L15 [3188]	13	Yellow ochre	127U/ 128U	3	2	3	
S2	9579	L16 [3893]	14	Red-brown	484U	2	1.75	2	
S3	8397a	L15 [3230]	12	Copper-blue	313U/ 320U	10	4.75	4	Mottled glaze. Misshapen "stick" marks along one side. An incomplete cylinder — see "technology" section.
S3	8397d	L15 [3230]	12	Copper-blue	301U/ 307U	5.25	3.25	3	Sand/quartz, and unglazed body material down one side.
S3	8440	L15 [3071]	—	damaged	—	5	3	2	Matted glaze. Wide central channel.
S3	8479a	L15 [3185]	11	Yellow ochre	128U/ 135U	3.75	4	2	One end flattened before firing.
S3	8725	K15 [3332]	3	Copper-blue	Process blue U	9.25	4	6?	Matted glaze. Two end segments blurred.
S3	9074c	L16 [3751]	14	damaged	—	10	3.75	6	Unglazed area down one side.
S3	9076	L16 [3751]	14	Copper-blue	311U/ 319U	2.25	2.25	2	

Table 2.16. Segmented beads.

Type	no.	prov.	room	glaze	Pantone	l.	dia.	comments
ES1	8384	K16 [3181]	10	Cobalt-blue grey	542U/ 549U	5.25	4.25	Uneven rim round each aperture. Quartz/sand grains in the glaze.
ES1	8410b	L15 [3230]	12	Copper-blue	312U/ 313U	3.75	3.5	
ES1	8410c	L15 [3230]	12	Copper-blue	310U/ 311U	4	3	Unglazed body material adheres to glaze.
ES1	8454	L15 [3227]	13	Copper-blue	312U/ 320U	3.75	3.75	"Faded" areas in the glaze, where the bead may have rested during drying. "Stick" marks where it rested in the kiln.
ES1	8496	L15 [3226]	13	Copper-blue	300U/ 307U	5	3.5– 4mm	Slightly flattened in section. Grains of sand/quartz in the glaze. Unglazed area around one aperture.
ES3	3270	L15 [3068]	14	Copper-blue	310U/ 311U	4	3	Unglazed body material adheres to the glaze.

Table 2.17. Extended sphere beads.

Type	no.	prov.	room	glaze	Pantone	th.	dia.	comments
FS1	8277a	L15 [3069]	11	Light cobalt-blue	No equivalent	8.5	9	Coarse body material, giving the glaze a rough appearance. Unglazed body material adheres to the glaze.
FS1	8277b	L15 [3069]	11	Light cobalt-blue	No equivalent	8	9	Identical to 8277a.
FS1	8511a	L15 [3229]	12	Copper-blue	Process blue/307U	4	5	
FS1	8511b	L15 [3229]	12	Yellow ochre	121U/ 128U	5.75	6.5	Unglazed body material adheres to the glaze.
FS1	8511c	L15 [3229]	12	Copper-blue	320U	3.5	4	Only 30% of the body glazed.
FS1	8511d	L15 [3229]	12	Copper-blue	312U/ 320U	3.75	3.75	Unglazed area down one side.
FS1	8511e	L15 [3229]	12	Copper-blue	312U/ 313U	3.25	3.5	Unglazed area down one side.
FS1	8511f	L15 [3229]	12	Copper-blue	311U/ 312U	3.5	4.25	Unglazed area down one side.
FS1	8511g	L15 [3229]	12	Copper-blue	312U	3.25	3.75	"Stick" marks down one side.
FS1	8511h	L15 [3229]	12	Copper-blue	312U	3.5	4	Unglazed area down one side.
FS1	8511i	L15 [3229]	12	Copper-blue	312U	3.5	4	Unglazed area down one side.
FS1	8511j	L15 [3229]	12	Copper-blue	311U and 325U	3.5	4	Unglazed area down one side. Glaze changes colour, possibly due to uneven kiln temperature.
FS1	8511k	L15 [3229]	12	Copper-blue	312U/ 313U	4	4	Grains of sand/quartz in the glaze down 2 sides.
FS1	8977a	K15 [3703]	1	Copper-blue	312U	5	6.25	"Stick" marks from firing, in the glaze.
FS1	8977b	K15 [3703]	1	Copper-blue	Process blue U/ 307U	7.5	8	Misshapen. "Stick" marks and limestone grains the glaze at one end.

Table 2.18. Flattened sphere beads.

Type	no.	prov.	room	glaze	Pantone	th.	dia.	comments
RB9	8898	K16 [3349]	8	Red-brown	484U	7.5	8.5	Spherical bead, with slightly flattened ends. Unusually large aperture. Regularly spaced ribs.
RB9	8980	K15 [3686]	1	Copper-blue	319U/ 320U	10.75	10.75	Spherical bead. Irregularly spaced ribs.
RB12	8978	K15 [3703]	1	Light green	457U/ 458U	4.5	6	Oval bead with irregularly spaced ribs. Raised rim around one aperture.

Table 2.19. Ribbed beads.

Type	no.	prov.	room	glaze	Pantone	th.	dia.	comments
C3	9064	L16 [3752]	-	Dark cobalt-blue	No equivalent	17	13.75	Found during cleaning.
PF2	8413	L15 [3230]	12	Yellow ochre	121U/129U	2	7.75	7 moulded ribs, radiating from a central aperture. A deposit of fine sand obscures about a third of the upper surface and most of the underside.
PF2	8518	L15 [3229]	12	Copper-blue	301U/308U	1.5	7	Sand/quartz on the underside.
FC2	8867	K15 [3325]	1	Cobalt-blue	299U/543U	5.5	8.25	The aperture at the base of the cone is offset from the centre.
L2	8868	K15 [3338]	3	Copper-blue	damaged	3.75	13	Irregular roughly circular shape. Areas of unglazed body material adhere to the glaze.
L2	8412	L15 [3230]	12	Copper-blue	damaged	3.75	14	Only 50% of bead survives.

Table 2.20. Miscellaneous bead forms.

Type	no.	prov.	room	glaze	Pantone	l/dia.	w.	th.	comments
Ring	8285	L15 [3069]	11	Cobalt-blue	541U/542U	5	-	2.25	Translucent. Thickening of the bead wall on one side, probably in response to gravity while being wound on a wire.
"Acacia" type	8494	L15 [3226]	13	Purple	No equivalent	9	8	2.5	Translucent. Irregularly trimmed ends. The glaze may indicate the presence of manganese.
"Drop"	8558	L15 [3072]	13	Turquoise-grey	No equivalent	9	-	4.75	Opaque. May also be classified as a pendant. Form shown in COA II bead corpus, no. XLVIII.
"Acacia seed" type	8658	L15 [3240]	4	Copper-blue	302U/508U	8	5.25	3	Translucent. Irregularly trimmed ends. A small length of wood 4mm x 1mm found in the central hole (see steatite cowroid 8536 for comments on a similar piece).
Flattened sphere	8727	K15 [3332]	3	Cobalt-blue	281U	5	-	3.5	
Ring	8900	K16 [3324]	3	Copper-blue	320U/327U	8.25	5	8.75	Opaque. Fragment, approximately 25% surviving. Estimated diameter 13.25mm. Large central aperture (6.5mm) coated with a brown coloured powder (?sand).
Cowroid	9025	L16 [3749]	7	Copper-turquoise grey	No equivalent	14.5	7.25	3.5	Opaque. See separate notes.
Extended sphere	9075	L16 [3751]	14	Cobalt-blue	289U	5.5	-	3.25	Opaque. A rim of glass around one aperture left from trimming.
Ring	9691	L15 [3189]	14	Cobalt-blue	-	5	1.5	1.5	Fragment only. Surface abraded square section. The original diameter estimated at 5-6mm.

Table 2.21. Glass beads.

no.	prov.	room	Pantone	l.	w.	th.	comments
8054	K16 [3030]	surface	312U	60	30.75	9.25	Described separately.
8282	L15 [3069]	11	308U	15	13.5	3	Blackened glaze.
8386	K16 [3172]	10	306U	11	6	3	
8411	L15 [3230]	12	318U/319U	8	7	3	
8482	L15 [3226]	13	–	4	3.5	1.5	Too small to record colour.
8516	L15 [3229]	12	318U/319U	10.5	5.2		
8617	L15 [3229]	12	301U	24	30	6	
8726	K15 [3332]	3	307U	12	8.5	6	
8730a	K15 [3324]	3	damaged	16	10	3.5	Found with part of an inlaid tile.
8981	K15 [3332]	3	Process blue/307U	14	10	6	
9028	L16 [3335]	15	294U	14	15.5	4	
9042	K15 [3748]	–	307U	9.5	8	1	Found during cleaning.
9069a	L16 [3751]	14	No equivalent	2	1.5	1	
9069b	L16 [3751]	14	No equivalent	1.6	0.9	5	
9081	L16 [3334]	14	308U	21	12.5	4	
9158	K15 [3685]	1	Process blue/313U	14	11	4	

Table 2.22. Blue-glazed tile fragments.

Type	no.	prov.	room	colour	l.	dia./th. + width	comments
Rod	8276	L15 [3069]	11	light grey-green	26.5	5-5.5mm	Oval in section, broken both ends. Several air bubbles visible within glass. Translucent.
Strip	8526	L15 [3073]	14	Cobalt-blue 281U	17	12 x 3mm	One end cut square, the other broken. In section, slightly curved.
Rod	8529	K16 [3033]	6	Cobalt-blue 288U/299U	52.5	4-6mm	Two connecting fragments, ends broken. Oval in section. Curved and tapering in outline.
Rod	8982	K16 [3686]	1	purple-blue	19.5	3mm	Broken both ends, circular in section. The purple colour may indicate the presence of manganese.
Rod	9029	L16 [3335]	15	Cobalt-grey blue	9.75	2.5-3mm	Broken both ends. Roughly circular in section.
Rod	9065	L16 [3752]	-	Cobalt-blue reflex blue U	18.5	3-3.5mm	Found during cleaning. Broken both ends. Semi-circular in section.

Table 2.23. Glass rod and strip.

Object	no.	prov.	room	l.	dia./th.	w.	weight	comments
Irregular shape	8286	L15 [3069]	11	--	--	--	--	Too small to weigh.
Irregular shape	8416	L15 [3230]	12	--	--	--	--	Too small to weigh.
Needle	8476	L15 [3185]	11	51.5	2	--	--	Approximately 50% of length survives (by comparison with complete pieces). The eye is lost.
Irregular shape	8493	L15 [3226]	13	--	--	--	2.6g	
Sheet fragment	8517	L15 [3229]	12	14	2	6	3g	
Sheet fragment	8561	L15 [3072]	13	8.25	2.25	4.25	2g	
Irregular shape	8724	K15 [3332]	3	--	--	--	1.6g	
?Blade fragment	8895	K16 [3349]	3	42	1	13	--	Part of the original outline may be preserved. Tapers slightly in section.
Irregular shape	9033	K15 [3684]	2	--	--	--	1.6g	
Irregular shape(s)	9063	L16 [3751]	14	--	--	--	18.5g	A number of pieces found together.
Irregular shape	9073	L16 [3751]	14	--	--	--	2.8g	
Sheet fragment	9078a	L16 [3334]	14	15.5	1-0.25	14	}1.3g	The thickness of fragment (a) varies. edge of (a) is folded through 360°.
Sheet fragment	9078b	L16 [3334]	14	12	0.25	9.5		

Table 2.24. Metal objects. Only pieces which retain any of their original outline have been measured and illustrated. Where the outline has been lost, the weight is given.