CHAPTER 8

NOTES ON THE MANUFACTURE AND USE OF FAIENCE RINGS AT AMARNA

by

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8.1 Introduction

For a long period after its initial development faience technology in Egypt remained largely unchanged. During the Eighteenth Dynasty, however, technical advances probably derived from the manufacture of glass led to the development of a stronger faience body material (Vandiver, in Kaczmarczyk and Hedges 1983: A108). This allowed the Egyptian craftsmen using moulding techniques to create finer, more delicate forms than had been possible hitherto with the older composition. This New Kingdom discovery, coupled with a period marked by the introduction of new designs and symbols into a usually conservative repertoire, led to the wide range of faience jewellery found at Amarna.

The faience ring is a product of this new technology. If it had been possible to create a ring with the earlier composition, which frequently relies upon thickness of material for strength, such a piece would have had a very limited life, due to the friable nature of the body material. The shape has its origin primarily in the metal signet rings introduced at this period (Hayes 1959: 186), which in turn owed their shape — particularly the oval bezel — to the earlier form of signet ring with a scarab-shaped seal. The first definite evidence for the manufacture of faience rings comes from the remains of the palace complex of Amenophis III at Malkata (Hayes 1951: 231–242). Such rings may have been manufactured at an earlier date; glass technology appears to have been introduced during the reign of Tuthmosis III,[1] though hard-bodied faience does not appear common at this time (Kaczmarczyk and Hedges 1983: 256). Ring bezels bearing the prenomen of Tuthmosis III may, however, date from a later period, reflecting the amuletic value which came to be attached to his name.

Following the reign of Amenophis III, all subsequent kings of the Eighteenth, and most of the Nineteenth and Twentieth Dynasties, are represented by faience ring bezels. The form appears to have survived the period of unrest at the end of the Ramesside Period, as shown by a preserved ring of Panedjem (Hall 1912: 283, no. 2735).[2] Whether faience rings were widely produced after the Twentieth Dynasty is not known. Faience manufacture appears to have declined in quality during the Third Intermediate Period, with the readoption of more traditional methods and the loss of much technical knowledge (Kaczmarczyk and Hedges 1983: 259, 265). In addition, lead, previously used as an ingredient of the flux in faience ring bodies, appears to have been less available (Vandiver, in Kaczmarczyk and Hedges 1983: A109), so that the production of faience rings in the quantities found at Amarna may no longer have been possible.

It has been suggested that such rings were distributed to mark festivals (Hayes 1951: 231), including the king's accession (Shaw 1984: 132). To the wearer they would appear to serve only a decorative or amuletic function, where the king's name was considered to possess divine power. Any explanation involving use as a seal, or badge of office, seems unlikely because of the brittle nature of the new body material[3] and the widespread distribution of hieroglyphic bezels amongst

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1 The date is open to question, see the discussion in Kaczmarczyk and Hedges 1983: 248–9.

2 Some variation occurs in the design of both pictorial and hieroglyph-bearing ring bezels. I have limited myself to considering here only the simplest form of hieroglyphic ring bezel as illustrated by pieces from the 1987 Amarna excavation season. For this reason I have not included within the discussion the larger form of signet ring found during the Twentieth to Twenty-third Dynasties.

3 Hall 1913: 277, no. 2683, and British Museum 1976: 243, no. 405, show a faience ring bezel mounted on an ivory ring. With the added strength of the ivory this could have been used as a seal. A similar piece, a faience bezel mounted on a stone ring, of unknown provenance, is exhibited in the Cairo Museum.

private houses at Amarna. An amuletic or decorative purpose would also serve to explain the small number of rings found at the Workmen's Village at Amarna where the text is so badly formed that it exists only as a number of blurred recesses on the bezel surface. Presumably such rings were still regarded as marketable (they were not made at the Village but brought in from outside), particularly if a large part of the workforce was illiterate.[4]

A further development which affected the appearance of the faience at this period was the introduction of new glaze-colouring agents (Kaczmarczyk and Hedges 1983, esp. 244ff.) to supplement copper, which gave the traditional blue-green colours. However, the majority of faience name-bearing rings at Amarna continued to be blue–green, by far the most common colour for faience generally at this site.

Although the term "ring" is used here, it is not certain that they were always worn as such.[5] The relatively flat inner face of the bezel would seem to preclude a comfortable fit on the finger, and in addition, some rings from Amarna seem to have a very large or small inner diameter. Extreme examples of this (e.g. Petrie 1897: Pl. III, no. 29) are of such small diameter that, if worn, they must have been either intended for a child, or suspended in some manner. However, this particular example, from a foundation deposit of Merenptah, could suggest that they were specifically manufactured as votive offerings, in a similar fashion to the model pottery vessels found in New Kingdom foundation deposits.

Although unprovenanced, the example illustrated here (Figure 8.1), originating as it does from the Spurrell collection (now at Liverpool), may have come from Amarna from the time of Petrie's excavations there, since Spurrell joined Petrie's camp for a time.

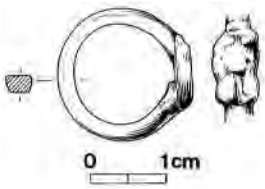

Figure 8.1. Liverpool no. 56.21.383. The ring is glazed light blue overall. It uses a Hathor-head moulding as a bezel (cf. Petrie type 280), a shape more commonly used as a necklace pendant.

8.2 Manufacture and general construction

In his report on his Amarna excavations, Petrie noted finding "two large glazing works" (Petrie 1894: 25), implying that centralized manufacturing areas existed. Research carried out on the remains from these areas suggests that an important product of these kilns was glass and frit (see Chapter 10), although the presence of a large number of faience moulds implies that, in addition, small faience objects were also manufactured; glass and faience use a number of the same colouring agents, and glass appears to have been added to the faience body material (Vandiver, in Kaczmarczyk and Hedges 1983: A108).

Evidence from more recent excavations suggests a number of smaller workshops scattered across the city (as noted by Griffith 1924: 203), offering an explanation for the large number of faience moulds found.[6] Both large and small workshops could have coexisted in a manner

[4] The same question can be posed for Middle Kingdom cylinder beads inscribed with the names of kings which, whilst superficially appearing to be cylinder seals, seem to have been largely amuletic. Again one of the reasons is the impossibility of being able to take a clear impression from some of them (Kemp and Merrillees 1980: 39–41).

[5] The presence of finger rings worn in a funerary context is noted in the Nineteenth Dynasty burial of Iit-nefer-ti, wife of Sennedjem at Deir el-Medina, where one faience ring was worn on each hand (Bell 1987).

[6] Moulds for faience objects accounted for one seventh of all small finds from Griffith's extensive excavations in the main city in 1923, still unpublished.

analogous to that of pottery manufacture at the site. The considerable numbers of faience inlays needed for official buildings at Amarna could have created the need for large organized centres of manufacture, while the majority of the population's requirements were met by smaller localized workshops.

The presence of large, possibly collective manufacturing areas might account for the (?) owner's marks placed on the reverse of certain faience moulds (as noted by Hamza 1930: 53–58). This practice does not seem to have been common at Amarna, the only examples currently known being on the reverse of a ring mould from the 1933–34 season (Figure 8.2), along with a similar mark on the reverse of a faience inlay, a surface find from Amarna, now preserved at the Ashmolean Museum, Oxford.

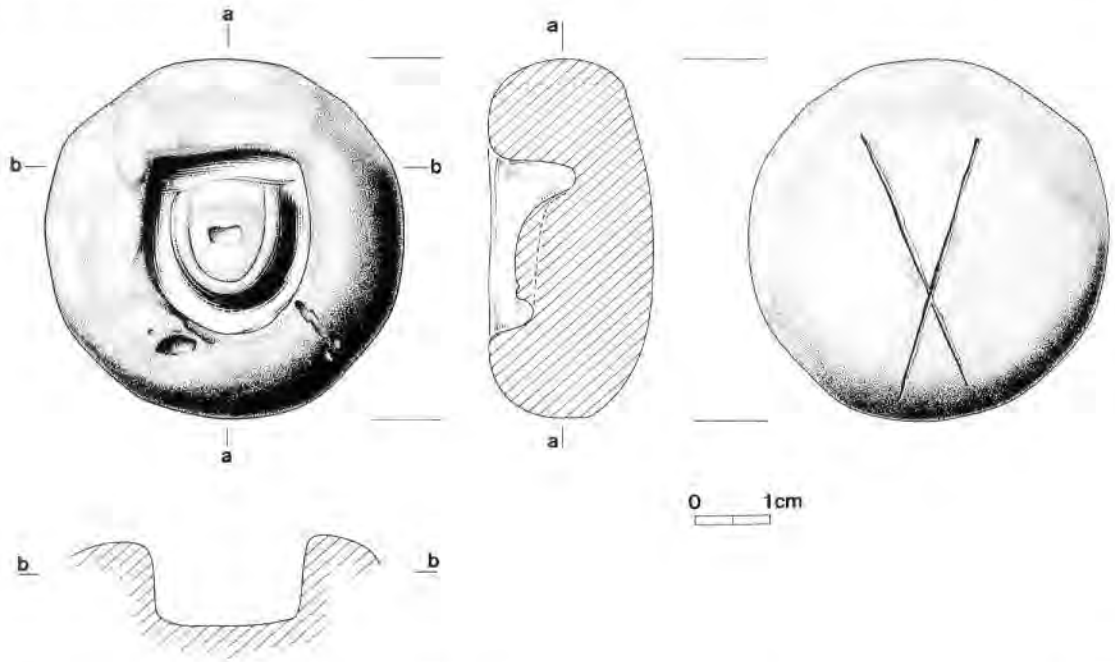

Figure 8.2. Cambridge Museum of Archaeology and Anthropology, accession no. 34-1100A. Mould made from an existing complete ring. This would probably have been used to produce just a ring shank. The reverse bears an (?) owner's mark scratched into the clay.

The methods of moulding and assembly illustrated by pieces from the 1987 season appear common to all faience rings. The ring shank and bezel were cast separately from clay moulds[7] and joined with a slurry of liquid faience. Several authors claim that faience rings were moulded in one piece, and that the design was later cut into the bezel face (e.g. Petrie 1894: 29; Hayes 1951: 395), though I can find no evidence for this from examining excavated material. Perhaps this is an error brought about by ring shank moulds featuring a "connecting bar" between the shank ends (Petrie type 238), or a mould made from an existing complete ring (Figure 8.2).

Some variation can be seen in the shape of faience rings. While most have a narrow ring shank, several examples are known with a wider, more durable band (Figure 8.3). As one of these more sturdily formed rings bears the name of Tutankhamun (Hall 1913: 280, no. 2705; British Museum 1976: 244, no. 406), the forms apparently coexisted, making any chronological significance in the difference of shapes unlikely. Both patterns of ring are found in metal at this time (Brovarski, Doll and Freed 1982: 246–47, no. 334–337).

[7] The suggestion that pieces were fired in their moulds has now been discredited (Vandiver, in Kaczmarczyk and Hedges 1983: A23).

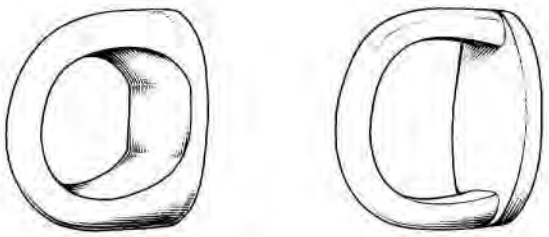

Figure 8.3. Comparison of ring shank types. These illustrate extremes, and considerable variation occurs between the two forms.

8.3 Glazes

Three methods of glazing faience have been proposed (see Kaczmarczyk and Hedges 1983 for a more complete discussion). The first — the addition of the raw materials of the glaze into the faience paste, which are then deposited on to the body surface as efflorescent salts during drying — is thought to have been the most common technique used in the New Kingdom. The other two methods involve applying the glaze to the moulded form, either as a thin slurry, or by surrounding the piece with a sintering powder in the kiln.

The slightly coloured cores of the faience pieces noted below may indicate that the "efflorescence" process was used, although this could equally be attributed to glass or faience "wasters" being ground and added to the matrix (Vandiver, in Kaczmarczyk and Hedges 1983: Appendix A, pp. A19–A20). In all three cases, the body material is what Lucas termed "ordinary faience", without a deliberately coloured core (discussion in Kaczmarczyk and Hedges 1983: 188).

8.4 Pieces from the 1987 season

1. Ring shank mould. Object no. 7962, from TA87.MC Grid no. 1 D4[2981] (Figure 8.4).
Height: 16.5 mm. Depth of mould: 5.5 mm.
Width: 40.5 mm.
Length: 41 mm.

Let us examine first a ring-shank mould. The example illustrated here (Figure 8.4) was selected as representative of the most common type. The mould is of a fine red–brown fired Nile clay,[8] without visible chaff temper, though with several small voids on the upper surface. The outer surfaces bear fingermarks from shaping. In the upper surface the pattern of a ring shank has been impressed. The mould has a slightly recessed centre between the ring-shank arms, a feature which probably assisted in the intact removal of the moulded form, and helped prevent any distortion caused by the movement of the shank arms. (The same purpose would be served by the "connecting bar" mentioned above). Two markings appear on the mould surface which seem to serve no evident function. At the closed end of the ring shank a rough channel occurs in the clay, evidently created before the clay was fired, while between the ring-shank arms there is a groove which may originate from some flaw in the master.[9]

Like all moulds of the period, this appears to be a single-piece unit, so that the ring shank was shaped on only one side. Any further shaping would have taken place by trimming with a blade

[8] My thanks to Pamela Rose for identifying the fabric.

[9] See Figure 8.2 for a similar mark.

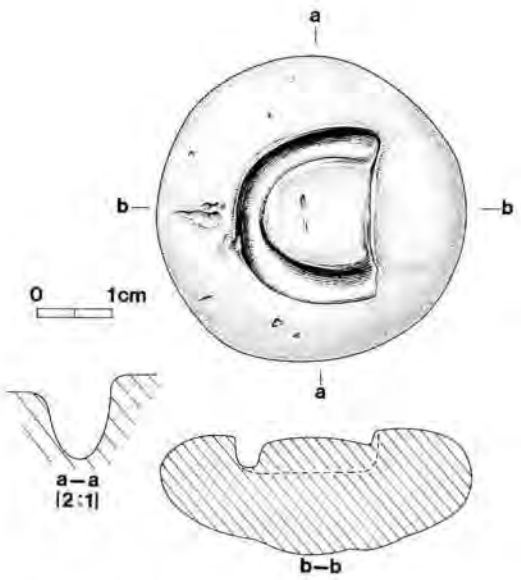

Figure 8.4. Mould for a ring shank, object no. 7962.

after preliminary drying. Ring shanks produced by this method are usually asymmetrical in section. The fact that it was found necessary to mould such a simple form implies a difficulty in shaping faience as a paste that replication studies have confirmed (Vandiver, in Kaczmarczyk and Hedges 1983: Appendix A, p. A21).

2. Bezel mould. Object no. 8761, from TA87.MC Grid no. 1 F6 [3393] (Figure 8.5).
Height: 11 mm. Depth of mould: 1.5–3 mm.
Width: 24.75 mm.
Length: 27.25 mm.

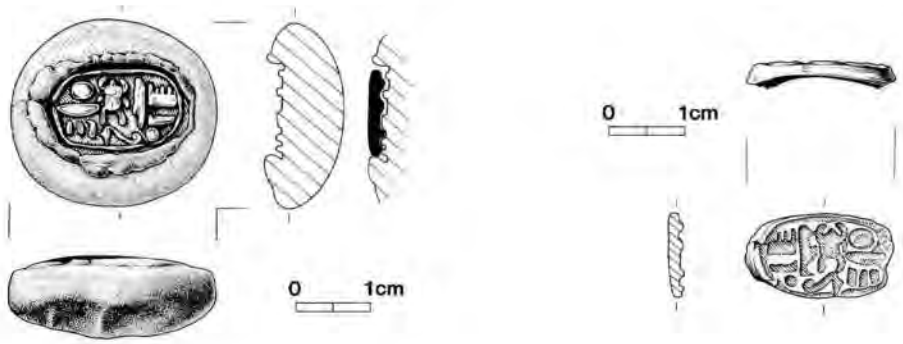

Figure 8.5. Mould for ring bezel (no. 8761), and ring bezel made from it (no. 8762).

This bezel mould is of particular interest, as a faience bezel originating from the mould was found in the same general area (Chapter 2). When first examined, a fine white power half-filled the central recess, almost certainly the remains of faience composition from a later unsuccessful

moulding attempt.[10] This material was retained for possible future analysis. When cleaned, the mould was found to be unusually shallow in comparison with known examples, but with a very clear inscription *Nb-ḫprw-rʿ stp n Ỉmn-rʿ* (Petrie type 119). The exterior of the mould bears fingerprints on the sides and upper surfaces, with a larger single palm-print across the base (as first noted by Petrie 1894: 28). This last feature suggests that the mould was held in a "cupped" hand while the original design was pressed into the wet clay.

On the top of the mould the aperture is surrounded by folds of clay. This is possibly the remains of a clay ridge created by pressing the mould sides around the master, to capture the exact outline, and later "rolled back" on to the upper surface. Perhaps this latter action caused one side of the mould to encroach upon the design (as shown in section A–B), so that part of the lower border was effectively lost from any impression taken (see the notes on the accompanying bezel).

The hieroglyphic design is well defined, with signs varying between 0.75–1 mm in height. With the exception of the  hieroglyph, which has been reduced to an uneven line, all the signs are easily recognisable. Several hieroglyphs, in particular the *nb*-sign and solar disc, have raised outer edges. This is probably not an intentional feature but rather may originate from whatever method was used to detail the original pattern.[11] Between the signs the base is flat and smooth. Around the outside of the text is an uneven raised border varying in height between 0.25–0.75 mm, with several breaks in its length. At the right of the design this border merges with the *mn*-hieroglyph. Since the accompanying bezel was made, damage has occurred to the design, in particular the central stroke of the plural sign is chipped along with the lower left leg of the scarab beetle and part of the border.

Despite the flaws mentioned above, the mould still appears usable. The powder filling the mould may have been the result of the inserted paste being too wet and sticking to the clay (Vandiver, in Kaczmarczyk and Hedges 1983: Appendix A, p. A24), and the combination of this with the overhanging mould wall could have led to its being discarded.

3. Bezel. Object no. 8762, from TA87.MC Grid no. 1 F6[3393]+G5[3269] (Figure 8.5).
Bezel length: 19.75. Glaze colour: 313U/314U[12]
Bezel width: 11 mm.
Bezel thickness: 2 mm.
This bezel is the "positive" from the bezel mould, object no. 8761, just described. When found it was broken laterally through the centre, with the mid-blue glaze on one half discoloured from burial in the soil. A comparatively recent break shows the core to be a greenish-white colour, though older damage is stained mid-grey.

Comparing the faience bezel with the mould, it can be seen that a great deal of detail has been lost or distorted during the manufacturing process. Surface tension of the glaze during firing could have caused the impressed hieroglyphs to lose their precise shapes and expand, so that the scarab beetle has merged with several surrounding signs. Except at the upper left of the bezel, the recessed border has become the outer edge, or been totally lost, as at the upper right, where the surface is misshapen and cracked.[13] Cracks also run across the whole of the bezel face, connecting the left-hand edge and *mn*-hieroglyph, scarab beetle and reed, and the *nb*-sign with the upper right side of the bezel. This cracking is a feature one might expect if the body material was too dry when pressed into the mould (Vandiver, in Kaczmarczyk and Hedges 1983: Appendix A, p. A24), a factor which may also have contributed to the poor reproduction of the bezel design.

The rear of the bezel has been trimmed so that it is concave, and a ring shank was originally attached with slurry, showing that although not an entirely successful impression, it was still used

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[10] Such was the quantity of material retained in the mould that I do not consider it the result of efflorescence from salts used in glazing, which might have been deposited in the mould. Cf. Vandiver, in Kaczmarczyk and Hedges 1983: Appendix A, p. A25.

[11] The source of these designs is not known for certain, although it has been suggested that metal rings were used as masters, Hayes 1951: 166.

[12] For recording colours a Pantone product selector, manufactured by the Letraset company, was used. Where matches could not be made exactly, the two nearest corresponding colours are quoted.

[13] Cracks have been omitted from the accompanying drawings for the sake of clarity.

as part of a ring.

4. Bezel. Object no. 8524, from TA87.MC Grid no. 3 [3250] (Small Aten Temple) (Figure 8.6).
Bezel length: 22 mm. Glaze colour: Dk. blue 302U.
Bezel width: 12.5 mm. Core colour: 263U/277U
Bezel thickness: 2.75 mm.

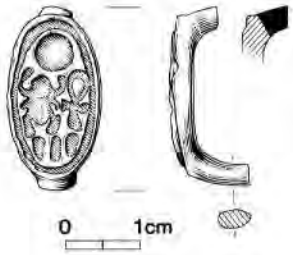

Figure 8.6. Ring bezel from the Small Aten Temple, no. 8524.

This incomplete ring was found in two pieces. The glaze is dark blue overall, which appears to fade to a lighter colour towards the bottom of the design.[14]

In shape the bezel is an elongated oval, not a common form, but one previously found at Amarna (Petrie types 6, 128). The moulded design bears the prenomen of Smenkhkare, *ʿnḫ-ḫprw-rʿ* (Petrie type 97). All signs are recessed up to 0.8 mm deep, with moulded centres to the sun disc and *ankh*-signs. The slight modelling within the body of the scarab beetle shows the characteristic division of the wing cases. The bezel centre created by the surrounding groove is raised above the outer edge, thus permitting a deeply moulded design without greatly weakening the bezel structure. Overall the design is clear, although the edges of the *ankh* and scarab touch the outer border. This may not have been a feature of the original mould. It is possible that a thin division between the hieroglyphs and border has been lost during moulding and firing, as was the case with the last bezel.

Viewed from the side, the bezel is slightly curved,[15] a feature accentuated by the trimming of the rear face. This trimming has left raised areas at the top and bottom of the bezel rear, which were then cut at an angle to receive the ring-shank arms (Figure 8.6). The ring shank and bezel were attached by a thin coat of slurry, mainly concentrated around these raised areas.

As commented earlier, the use of dark blue pigment is less common than the turquoise-green colour produced by the use of copper, although rings with both glazes occur from excavations at both the Workmen's Village and Main City.

5. Complete ring. Object no. 8338, from TA87.MC Grid no. 1 D4[3154] (Figure 8.7).
Bezel height: 21.5 mm. Glaze colour: 570U
Bezel width: 0.9–1.8 mm.
Length of ring: 19.75 mm.
Maximum inner diameter: 15.5 mm.
Having described several moulds and ring bezels, we shall now examine a complete ring. This

[14] The dark-blue colour was probably created by the use of cobalt as a colouring agent. Examined under x30 magnification, the colour-change was found to be caused by copper-green flakes in the glaze, a greater accumulation being on the lower half, creating a mottled effect. A similar effect has been noted on other dark blue glazes, see Vandiver, in Kaczmarczyk and Hedges 1983: A117. Note that cobalt is so strong a colouring agent that Kaczmarczyk and Hedges recognise it as such with only 0.5% cobalt present. Copper is usually present in such glazes in far higher quantities, Kaczmarczyk and Hedges 1983: 41–43.

[15] Both convex and flat bezels occur in faience, and moulds also demonstrate both forms. In some cases the bezel may have become curved during removal from the mould.

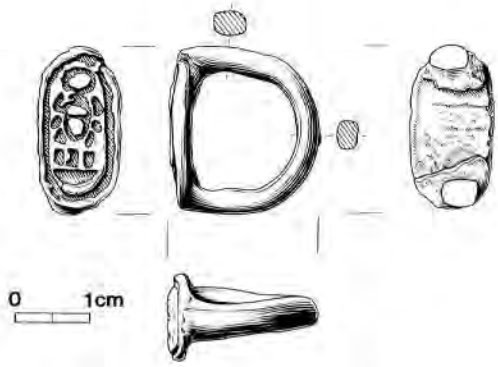

Figure 8.7. Faience ring, no. 8338.

example was found in four pieces, the bezel itself split into three. When restored, it was seen to be complete, apart from a small area of slurry missing from the lower rear face of the bezel. All breaks appear to be relatively recent, and the ring may have been complete when lost or discarded. The glaze is a mid copper-blue overall, with a greenish tint on the upper part of the bezel and shank, possibly indicative of an uneven kiln temperature during firing (Kaczmarczyk and Hedges 1983: 150).

The outer face of the bezel bears the prenomen of Tutankhamun, *Nb-ḫprw-r'* (Petrie type 108) in clear deeply set hieroglyphs up to 0.4 mm deep. All signs have raised centres, although in the case of the *nb*-sign this is not as distinct. Surrounding the name is a ragged groove, which, with the uneven outline of the bezel, suggests moulding difficulties. Three fine cracks run vertically in the glaze across the top of the bezel face. One of these travels up the side of the sun disc to connect with a triangular area missing from the top of the design. This missing area is not modern damage, to judge from the way that glaze has accumulated around it, but was present before firing.

In side view the bezel is slightly convex, and the central area bearing hieroglyphs can be seen to be raised above the outer border, in a manner similar to the previous example. Due either to moulding or subsequent trimming, the bezel varies between 0.9 and 1.8 mm in thickness. At the bezel rear, the glaze appears thinner, exposing a rough gritty surface with numerous tiny airholes. Small areas of glaze are missing, apparently having flaked away since firing. The thinner coating of glaze at the bezel rear suggests that the efflorescence glazing process was used for this ring. The thinner glaze at this point is probably due to two factors: first, the resting of the newly cut bezel face-upwards during preliminary drying, which would restrict the formation of salts on the bezel rear; and secondly, if the rear face was trimmed as the piece was beginning to harden, this would remove any salts which had begun to form. The marks of trimming are clearly visible on the rear and sides of the bezel. Nearly a quarter of the bezel rear is covered by slurry fixing the ring-shank arms in place. Where this has broken away, an unglazed area has been exposed which has discoloured brown (indicated by stipple on the drawing).

The ring shank appears more finished than the bezel, with a smoother outline. Trimming and assembly have altered the original shape of the ring shank, particularly where it joins the bezel. At this point, the slurry extends up to 9 mm along the ring shank, disguising the manner of assembly and creating the illusion of a one-piece moulding.

Several flaws in the manufacture are apparent. The ring shank has warped so that its arms are no longer in alignment (possibly caused during removal from the mould); when seen in profile, the ring shank does not meet the bezel rear at the expected 90° angle, and in addition the shank is offset from the exact upper and lower points of the bezel.

8.5 Conclusions

Like most faience jewellery of the period, faience rings copy designs already existing in faience or stone. With the ready availability of the raw materials for body and glaze, along with the introduction of new moulding techniques to speed production, such rings could be made available to all levels of society. The apparent widespread distribution of faience rings, coupled with their short lifespan (due to the brittle nature of the body material), could point to the relatively low status of the faience ring as a piece of jewellery. However, although it appears that the rings found at Amarna were commonly worn in daily life, they also merited inclusion within the funerary goods of the elite, since light blue rings bearing the name of Tutankhamun were found amongst the grave goods of that king's tomb (Murray and Nuttall 1963: particularly p. 19, entry 620 [66a–g]).

Acknowledgements

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References

Bell, M. (1987). "Regional variations in polychrome pottery of the 19th Dynasty." In *Cahiers de la céramique égyptienne*. Tome 1. Cairo, IFAO.

British Museum (1976). *Jewellery through 7000 years*. London.

Brovarski, E., S.K. Doll and R.E. Freed, ed. (1982). *Egypt's golden age; the art of living in the New Kingdom 1558–1085 B.C.* Boston, Museum of Fine Arts.

Carter, H. and A.C. Mace (1923). *The tomb of Tut-ankh-Amen*. Vol. I. London.

Griffith, F.Ll. (1924). "Excavations at El-'Amarnah, 1923–1924." *JEA* 10: 299–305.

Hall, H.R. (1913). *Catalogue of Egyptian scarabs, etc., in The British Museum*. London.

Hamza, Mahmud (1930). "Excavations of the Department of Antiquities at Qantîr (Faqûs district) (May 21st-July 7th, 1928)." *ASAE* 30: 31–68.

Hayes, W.C. (1951). "Inscriptions from the palace of Amenhotep III." *JNES* 10: 231–242.

Hayes, W.C. (1959). *The scepter of Egypt;* a background for the study of the Egyptian antiquities in The Metropolitan Museum of Art. Part II: the Hyksos Period and the New Kingdom (1675–1080 B.C.). Cambridge (Mass).

Kaczmarczyk, A. and R.E.M. Hedges (1983). *Ancient Egyptian faience;* an analytical survey of Egyptian faience from Predynastic to Roman times. Warminster. With appendix by P. Vandiver.

Kemp, B.J. and R.S. Merrillees (1980). *Minoan pottery in second millennium Egypt*. Mainz.

Khawam, R. (1971). "Un ensemble de moules en terre-cuite de la 19e dynastie." *BIFAO* 70: 133–160.

Murray, H. and M. Nuttall (1963). *A handlist to Howard Carter's catalogue of objects in Tut'ankhamun's tomb*. (Tut'ankhamun's Tomb Series, I). Oxford.

Petrie, W.M.F. (1894). *Tell el Amarna*. London.

Petrie, W.M.F. (1897). *Six temples at Thebes. 1896*. London.

Petrie, W.M.F. (1917). *Scarabs and cylinders with names*. London.

Shaw, I.M.E. (1984). "Ring bezels at el-Amarna." In *AR* I: 124–132.