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Notes

Notes

Archaeological Excavations of a Bead Workshop in the Main City at Tell el-Amarna

An area measuring 217 square meters in the Main City South at Tell el-Amarna was excavated by a team of four archaeologists and eight workers between October 18 and November 13, 2014 (Fig. 1). The work focused on a building complex denominated M50.14–16 by C. L. Woolley, who initially excavated these buildings on behalf of the Egypt Exploration Fund in 1922.¹

The recent project was planned after an area of vitrified mud-brick debris was discovered on the surface of M50.14, an indicator of high-temperature industries. The original publication described it as a workshop for the manufacture of glass and faience objects, and because the field director's expertise lies in the study of Late Bronze Age Egyptian glass industries, this site was selected for excavation.

The work, which was undertaken on behalf of the Amarna Project, was made possible through a Rakow Grant for Glass Research from The Corning Museum of Glass, for which the field director is very grateful. This report contains contributions by Sue Kelly, Ashley Bryant, and Kimberley Watt.

The Archaeological Remains

The building complex, as originally published in 1922, encompasses a domestic house (M50.16), a secondary building to the east of this house (M50.15), and the surrounding courtyard (M50.14) (Fig. 2). While the work centered on the courtyard M50.14, the house M50.16 was also excavated in order to establish the spatial and functional relationship between the courtyard and the domestic complex. M50.15 was left largely unexcavated and remains to be studied (Fig. 3).

The location of the excavation area was based on the original plan of the site, created by Francis Newton, the architect who worked alongside Woolley during the 1922 season, and published in 1923. This publication describes the location as follows: "At point X: remains of a glaze kiln: pit cut in sand 1.00m diam. by 0.50m deep, full of

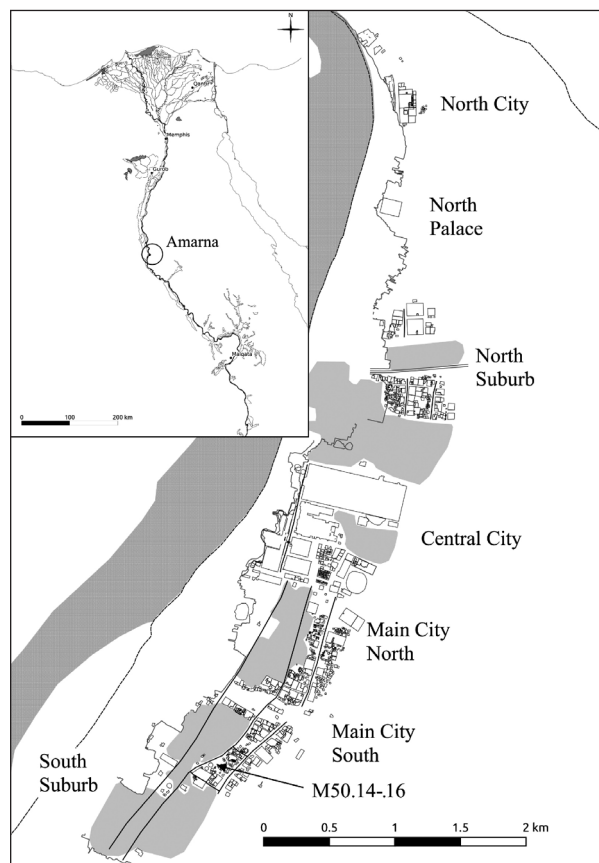


FIG. 1. Map showing location of Tell el-Amarna and buildings M50.14–16 in Main City South.

burnt brick, glass and glaze slag, and fragments of the pots used in the kiln for standing the vessels on: the bottoms and sides of these are covered with tricklings of glaze." The area around this feature marked the easternmost extent of the excavation, while the westernmost edge encompassed the western boundary wall of the main house (M50.16)

1. T. Eric Peet and C. Leonard Woolley, *The City of Akhetaten*, pt. 1, *Excavations of 1921 and 1922 at El-'Amarneh*, London and Boston: Egypt Exploration Society, 1923, p. 19.

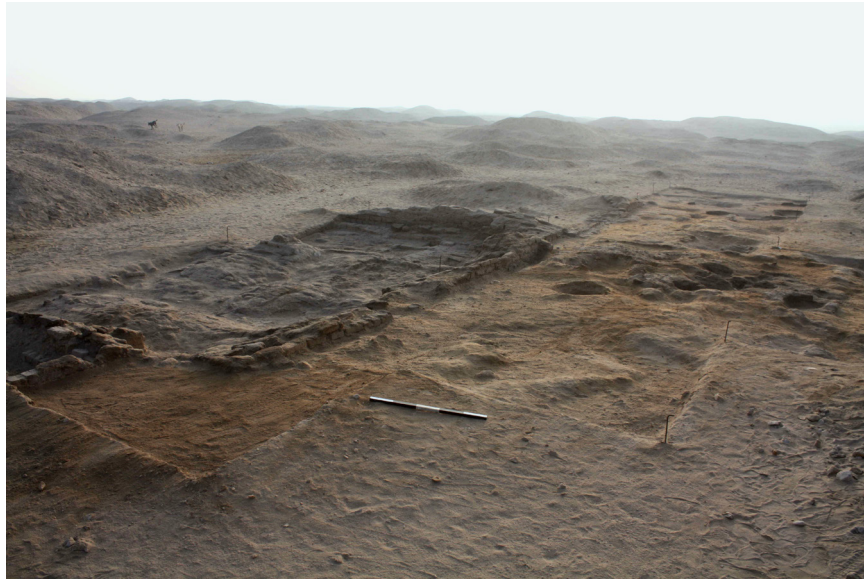


FIG. 2. Site M50.14-16 as excavated in 2014, looking northwest, showing courtyard to the south and main house to the north.



FIG. 3. Plan of site as excavated, showing wall structures and archaeological features, superimposed on original plan from 1923.

and some of the adjacent walls, which do not appear on the original plan and have not been previously excavated.

The area of excavation at M.50.14–.16 had been surveyed using magnetometry during the Amarna Geophysics Field School in 2011. Despite “noise” in the data caused by the overburden, we can clearly delineate the rectilinear alignment of mud-brick architecture in the location of the house. Its walls were uncovered during the excavation, with alterations made to the original plan established in 1922. Further review of the geophysical data identified an area of pronounced magnetic anomalies along the southern perimeter of the house. The strength and nature of these anomalies are what may be expected from fire-affected materials. This, in part, correlates with the location of vitrified material observed on the surface, and with the household oven, noted in 1922. Additional pit features were excavated in the southern squares, along with ephemeral deposits of fired material, including vitrified mud brick and sandstone, and heat-affected ceramics.

Approximately 60 square meters of M50.16 was excavated, and the preservation of the walls is somewhat poor (Fig. 3). The 1922 plan presents a slight discrepancy relating to the recently uncovered layout: The eastern exterior wall, which runs north–south through the eastern part of grid square I-3, is indeed double, but the more western of the two walls does not run at an angle off the other, as the 1922 plan assumed. The southern exterior wall is double for most of its extent. Only a few courses of bricks of the western exterior wall are preserved. Further to the west, under a layer of collapsed mud bricks, two walls running east–west were discovered, and these are not discernible on the original plan. The more southern of these walls may be expected to extend farther west from the boundaries of the present excavation, in order to delimit a courtyard in which the partial remains of a silo stand. The northern exterior wall and the northern spaces were not uncovered by the recent excavation.

The southeastern part of the house was initially published as a small, open courtyard, containing a round oven with a ceramic lining that still held its original deposit of ashes and charcoal. This oven was probably used for the preparation of food, as is demonstrated by animal bones together with a concentration of discarded pottery

along the eastern boundary wall. A mud-brick casing in the center of the house indicates the presence of a staircase leading to an upper story that partly covered the house.²

The modern surface of the southern courtyard (M50.14) was found covered with vitrified material (i.e., molten mud brick and sandstone). This was interpreted as evidence of high-temperature technologies, in particular glass, because this phenomenon is known from other glassworking kilns in ancient Egypt, most notably from Amarna itself. Site O45.1 in the Main City North, which was excavated by Paul Nicholson in the 1990s, contains a series of kilns used for glassworking and faience manufacture, all of which display a high level of vitrification.³ The excavators therefore expected to discover such a structure below the collapse of several mud-brick walls.⁴ However, a rather poor level of preservation was anticipated because torrential rains and floods have affected many of the archaeological structures and layers.

The ancient floor of the courtyard to the south of the main house and to the southeast of M50.15 was based on the natural desert surface. In places, a compact, muddier deposit was found, into which features had been cut, divided by small, badly preserved walls. The courtyard contained numerous pits, many of which showed traces of burning activity, including charcoal. The concentration of vitrified material to the south of the main house was followed down to a hard surface, into which a shallow pit that served as a dump for this material had been cut. Below this, a concentration of small stake holes was encountered (Fig. 4). Their function remains uncertain. No kiln structure was discovered, either in the southern central portion of the courtyard or in its eastern sections, at the aforementioned “point X” (Fig. 3). However, the concentration of vitrified material indicates the

2. Cf. Kate Spence, “The Three-Dimensional Form of the Amarna House,” *Journal of Egyptian Archaeology*, v. 90, 2004, pp. 123–152.

3. Paul T. Nicholson, *Brilliant Things for Akhenaten: The Production of Glass, Vitreous Materials and Pottery at Amarna Site O45.1*, London: Egypt Exploration Society, 2007.

4. A similar scenario was found at Gurob in the Faiyum, where vitrified mud bricks covered the surface above a kiln structure. See I. Shaw, “The Gurob Harem Palace Project, Spring 2012,” *Journal of Egyptian Archaeology*, v. 98, 2012, pp. 43–54.



FIG. 4. *Remains of dump of vitrified mud brick and sandstone, together with underlying and surrounding stake holes, looking west.*

presence of high-temperature technologies, probably in cavelike structures or small pits that had been destroyed or cleaned out (Fig. 5).

An almost intact water jar was found in situ in the southwestern courtyard. The surrounding and eastern areas yielded much artifactual evidence of industrial activity, indicating that the area had been used as a bead and amulet workshop, although there is also evidence that glass vessels were decorated here:

- A large quantity of red-banded pebbles and debitage (flakes and chips), two beads, and a carved amulet of chalcedony or agate were discovered within and just below the collapse of the southern boundary wall of the house (Fig. 6).

- Five faience molds, indicating that small faience items were produced, represent a variety of amulet shapes, including scarabs. A faience scarab was found to match one of the molds (Fig. 6). Of the 37 faience amulets uncovered, a small number depict domestic gods, such as Bes, and the most commonly found type was the collar pendant (Fig. 6).⁵ Other faience fragments include tiles, inlays, or fragments thereof, in addition to a small number of vessel fragments.

- Among a group of 328 faience beads of a variety of types, the most common form is the small ring bead. In addition, many wasters (i.e., manufacturing errors), in which beads fused together and were discarded, were found.⁶

- Ninety-two glass beads of various types, both whole and broken, were uncovered. Some were misshapen or incomplete (i.e., showing trails of glass yet to be polished away). A concentration of unpolished spherical blue glass beads was found in the southeastern outer courtyard of the complex, adjacent to a series of small fireplaces, indicating a working area (Fig. 6).⁷ Metal from the site included four blades and 15 rods. The latter would have been used in the production of glass beads; the molten glass was wrapped around the rod to form the bead (Fig. 6).

- More than 300 fragments of glass were excavated, most of which are chips of glass ingots, indicating that the processing of glass (rather than the manufacture of raw glass) took place at this site (Fig. 5). Also discovered were 116 glass rods, bars, and strips, including drops, which formed the ends of glass rods and indicate work in progress.

5. The classification of these is based on Andrew Boyce, "Collar and Necklace Designs at Amarna: A Preliminary Study of Faience Pendants," in *Amarna Reports VI*, ed. Barry John Kemp, Occasional Publications, v. 10, London: Egypt Exploration Society, 1995, pp. 336–371, esp. pp. 345–356.

6. For a classification of faience beads from Amarna, see Andrew Boyce, "House P46.33: The Finds," in *ibid.*, pp. 44–136, esp. pp. 75–82.

7. The same system of classification was used here as is defined in Barry J. Kemp and Anna Stevens, *Busy Lives at Amarna: Excavations in the Main City*, v. 2, *The Objects*, London: Egypt Exploration Society, 2010, pp. 111–115.

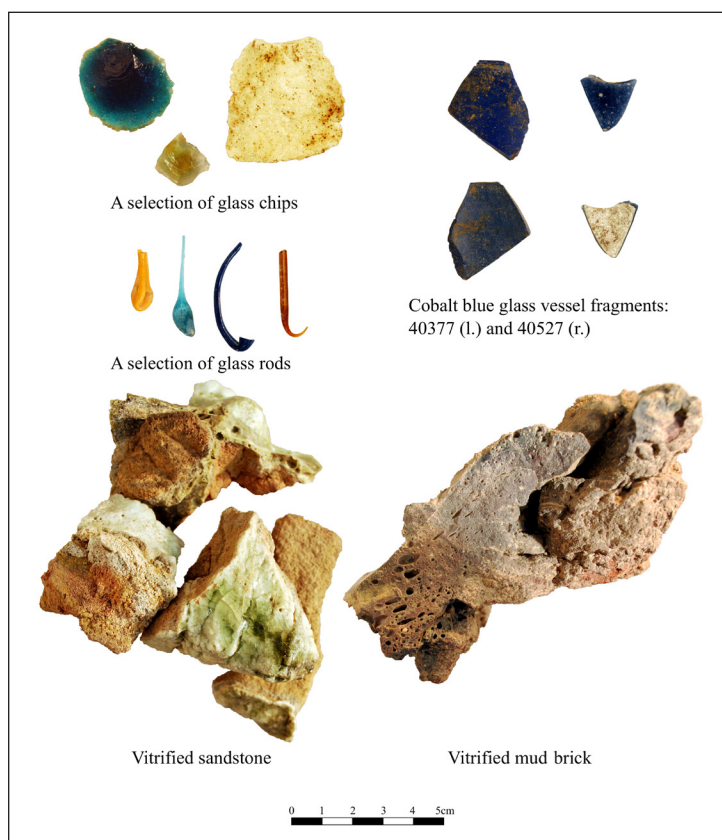


FIG. 5. Finds related to glassworking, together with sample of vitrified materials from M50.14–16.

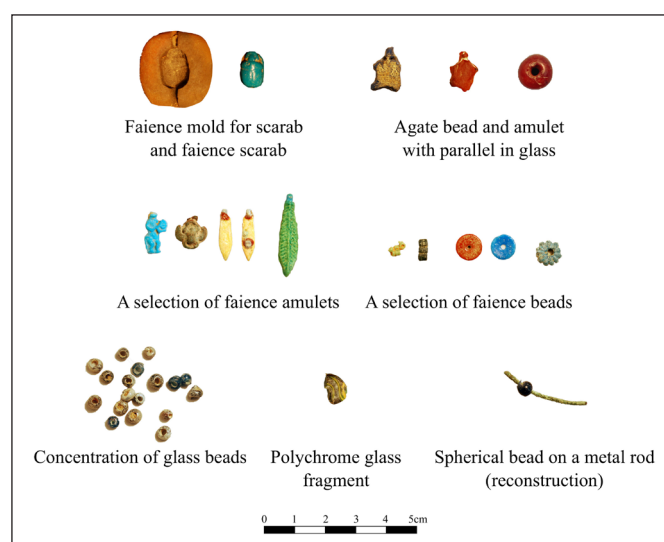


FIG. 6. Representative selection of amulets and beads from glass and faience found at M50.14–16.

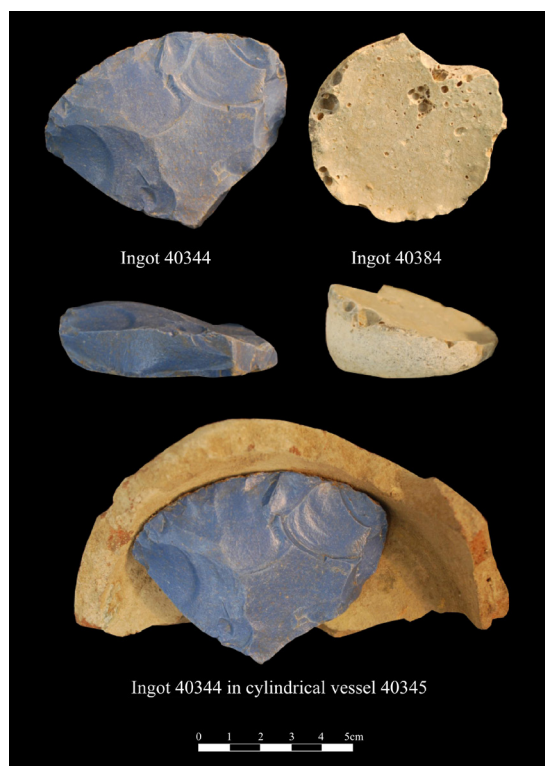


FIG. 7. Two glass ingots found in southern courtyard of site M50.14–16.

The color of the glass ranges from dark cobalt blue and turquoise blue-green, the two most common hues of ancient Egyptian glass, through purple, yellow, and almost colorless to opaque white. Two blue glass ingots were found, and these are somewhat important because only a few of them exist from Late Bronze Age Egypt. One of these ingots (reg. no. 40384) is fully preserved and relatively small, while less than half of the other example (reg. no. 40344) is preserved. Nevertheless, it fits perfectly into the bulk of the cylindrical vessels found across the site, and it is roughly the same size as the glass ingots from the Ulu Burun shipwreck (Fig. 7).⁸ Two undecorated cobalt blue glass vessel fragments were registered, and these indicate that the decoration of such vessels took place at the site (Fig. 5).

- Surface layers and old spoil heaps nearby (which remain unexcavated) yielded 51 fragments of cylindrical vessels. These vessels have been interpreted as molds for glass ingots, as well as vessels used for the remelting of glass and the drawing of glass rods for the decoration of vessels and the

production of beads. Some fragments were found with blue glass adhering to them.

Conclusions

From this corpus of finds, we can infer that the excavated workshop must have processed relatively large quantities of glass. Recent excavations at the nearby house of Ranefer⁹ have also yielded much evidence of glassworking, which concurs with the hypothesis that this area of the Main City South at Amarna was somewhat specialized in this activity.

The evidence would suggest that the workshop in the courtyard specialized in the production of glass and faience beads and amulets, and that it also decorated some glass vessels and made beads from other materials, such as chalcedony, by carving. Overall, it can be stated that the excavated complex represents a typical Amarna household, encompassing a main domestic building, some secondary buildings, and some working areas outside these spaces. The general layout of this complex fits well into the greater picture of Amarna, and particularly that of the Main City, where it is believed that areas of small industrial houses developed alongside the larger houses of the wealthy, to whom they reported.

While this project has been successful in establishing the nature of the industrial activities within this building complex, as well as the relationship between the domestic complex and its courtyard, there is room for future excavation at the site and for analytical work on the finds. This would improve our understanding of the socioeconomic structures of the Main City South at Amarna, and throughout New Kingdom Egyptian urban settlements.

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8. Paul T. Nicholson, Caroline M. Jackson, and Katharine M. Trott, "The Ulu Burun Glass Ingots, Cylindrical Vessels and Egyptian Glass," *Journal of Egyptian Archaeology*, v. 83, 1997, pp. 143–153.

9. Kemp and Stevens [note 7], pp. 487–524.