



Article: “Brick by brick”: Piecing together an 8th century BC façade from Iraq

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“BRICK BY BRICK”: PIECING TOGETHER AN 8TH CENTURY B.C. FAÇADE FROM IRAQ

Alison Whyte, Vanessa Muros and Sarah Barack

Abstract

This poster addresses the history, analysis and conservation treatment of a collection of polychrome glazed bricks excavated in the first half of the 20th century, at Khorsabad, Iraq. The bricks originally formed part of a tableau that flanked the entrance of the 8th century BC Sin Temple. After excavation in 1933, they were packed in wooden crates and then shipped to the Oriental Institute Museum, University of Chicago. The bricks remained in storage until 1990, when the first of several crates was opened. Initial consolidation tests were performed at that time. Extensive conservation of the pieces began in 2001 with an analytical study to determine the compositions of the colored glazes. Treatment then focused on the stabilization of the bricks in preparation for their exhibition in the newly reinstalled Mesopotamian galleries.

1. History of the site

Khorsabad, located in Iraq some 12 miles northeast of the city of Mosul, was founded by Sargon II, who ascended to the Assyrian throne in 722 BC. The founding of a new capital city was a rare occurrence in ancient Assyria, and the vast amount of resources and material it required is indicative of the strength of the empire at that time. Sargon never lived to see his capital flourish, however, as he died in battle in 705 BC. Modern interest in the site began in 1843, when the then French consul to Mosul, Paul Emile Botta, unearthed some of the stone reliefs. Botta left Iraq in 1844, and further work at Khorsabad was suspended until 1852-4, when it resumed briefly under the direction of the next French consul, Thomas Victor Place. The Oriental Institute began to excavate at the site in 1929, with Henri Frankfort at the helm of the project. This directorship was later passed on to Gordon Loud and excavation proceeded for several seasons (1929-30, 1931-2, 1933-4). (Albenda 1986).



Figure 1. Map of Ancient Near Eastern archaeological sites. <http://oi.uchicago.edu>



Figure 2. Excavating the threshold of the doorway to the Sin Temple. Glazed brick façade partially visible at the foreground. (Loud 1936, 91).

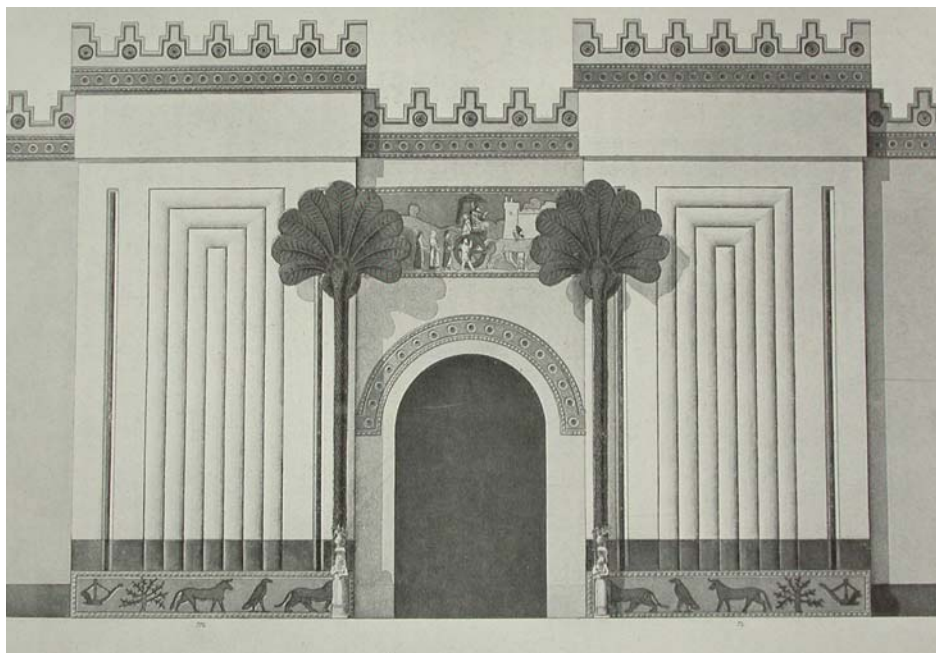


Figure 3. Reconstruction drawing of the Sin Temple façade (Place 1870, 24).

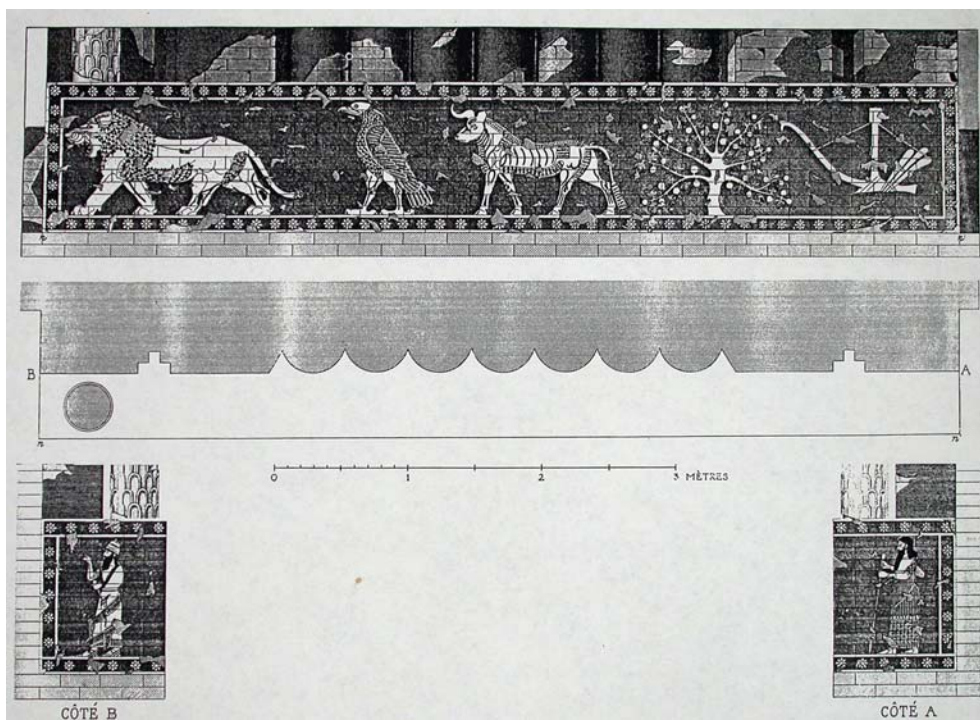


Figure 4. Reconstruction drawing of brick tableau. (Place 1870, 26).



Figure 5. Gordon Loud, ca. 1930. (Oriental Institute Archives). Loud's journal describes the excavation conditions, including notes on the removal of the bricks, stating: "... what a climate, popping out of the cold rainy weather into this glorious spring variety, almost over night. Today it was actually uncomfortable working with even a suit on, and we both ended up in short sleeves! ...As we get away from the corner the bricks seem to be less broken, though I had to cast off several that were too hopelessly in fragments. I now realize as we get them in boxes that the job of removing them from the containers will be the more ticklish of the two..." (Loud, 1933).



Figure 6. Brick façade in situ; the numbers were written on the photograph at some point after the bricks had been shipped. (Oriental Institute Archives).

2. Analysis of the Glaze Using Scanning Electron Microscopy with Energy Dispersive Spectrometry (SEM-EDS)

Samples of blue, black, yellow and white glaze were removed and then prepared in one of two ways for SEM-EDS analysis. The smaller samples of glaze were mounted on aluminum stubs using carbon paper. Larger cross section samples, which contained both glaze and brick fabric, were mounted in Buehler Epo-Thin Low Viscosity Epoxy Resin (No. 208140032 – resin, No. 08142016 – hardener). The excess epoxy resin was cut away from the mounted sections using the Buehler Isomet 1000 Precision Saw (No. 11-2180). Buehler Isocut Cutting Fluid (No. 112293016) was used as a lubricant during the cutting process. The sections were then polished using a rotating wheel (Buehler Metaserv 2000 Grinder/Polisher – No. 95-2809) and progressively finer grits of 8" Buehler Carbimet Discs – PSA backed (silicon carbide paper - No. 305128).

The results of the SEM-EDS analysis suggest that the bricks are decorated with alkaline glazes consisting of a silica glaze former and several glaze modifiers including sodium, potassium, aluminum and/or calcium compounds. Elements detected which could have acted as colorants for the blue, black, yellow and white glazes are listed below.

<i>Glaze Color</i>	<i>Colorant Elements Detected</i>
Blue	Copper (Cu), Manganese (Mn)
Black	Manganese (Mn), Iron (Fe)
Yellow	Lead (Pb), Antimony (Sb) - opacifier
White	Calcium (Ca), Antimony (Sb) - opacifier

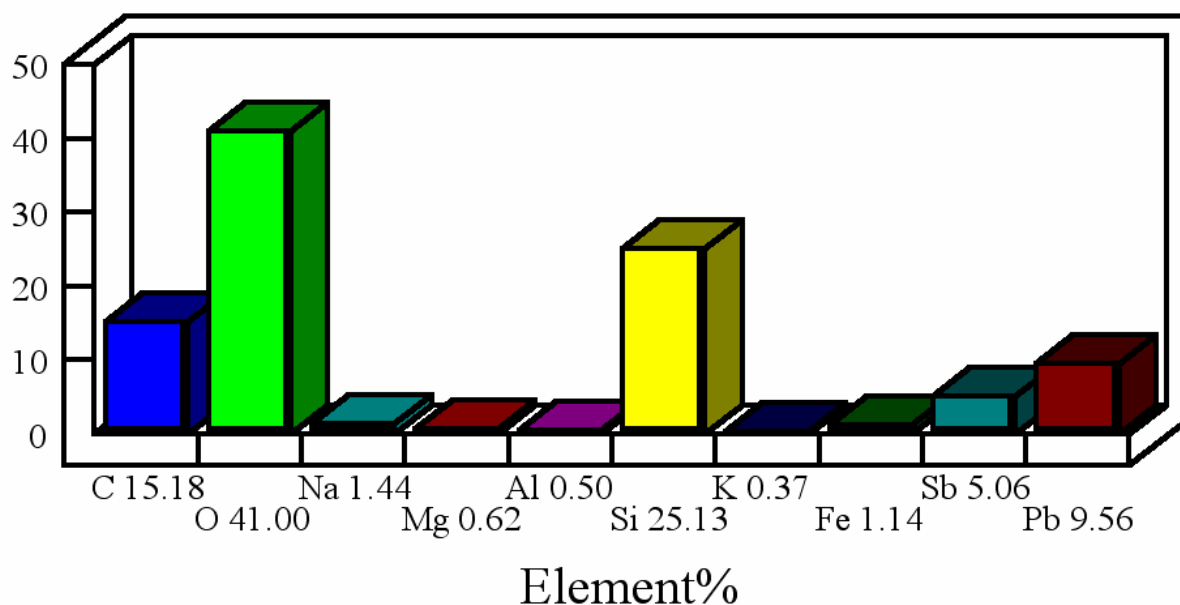


Figure 7. EDS spot analysis of sample of yellow glaze. Sample taken from glazed clay brick, Sin Temple, Khorsabad, Iraq, 722-705 BC, Oriental Institute Museum, OIM A11810.269.

Other Observations

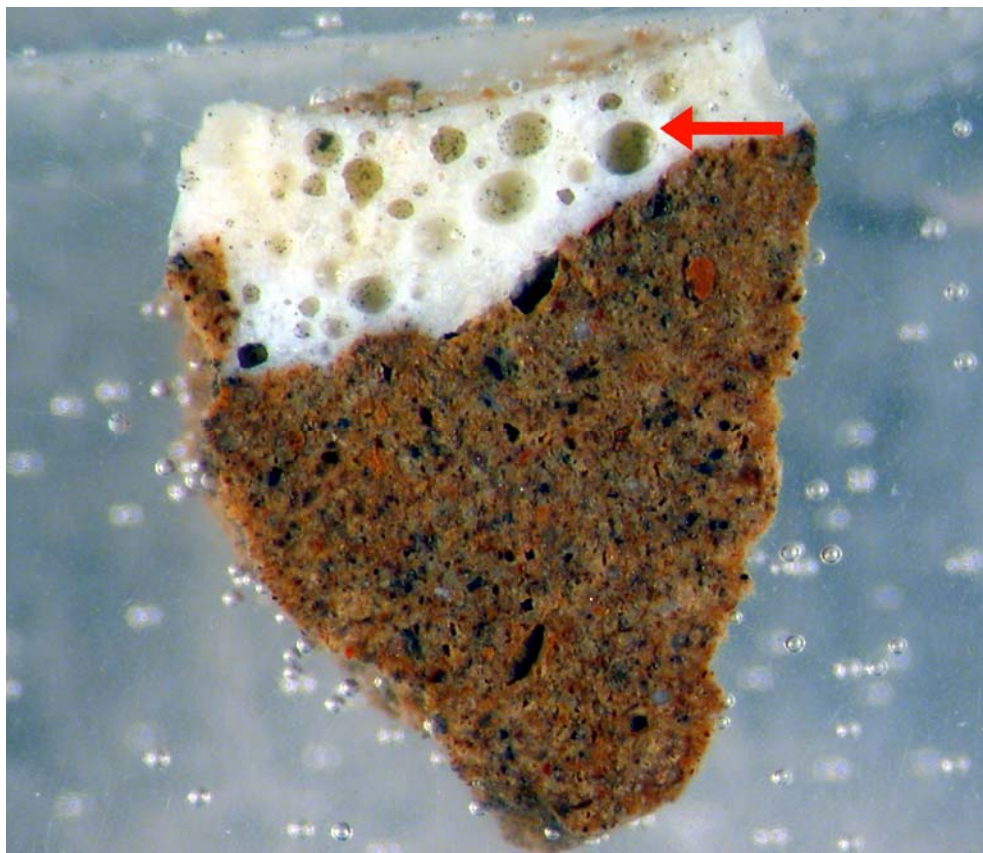


Figure 8. Cross section of white glaze showing air bubbles (see arrow). The presence of these bubbles may indicate overly rapid firing of the glaze, insufficient mixing or a lack of fluidity in the glaze prior to firing. Magnification: 20x. Sample taken from glazed clay brick, Sin Temple, Khorsabad, Iraq, 722-705 BC, Oriental Institute Museum, OIM A11810.108.

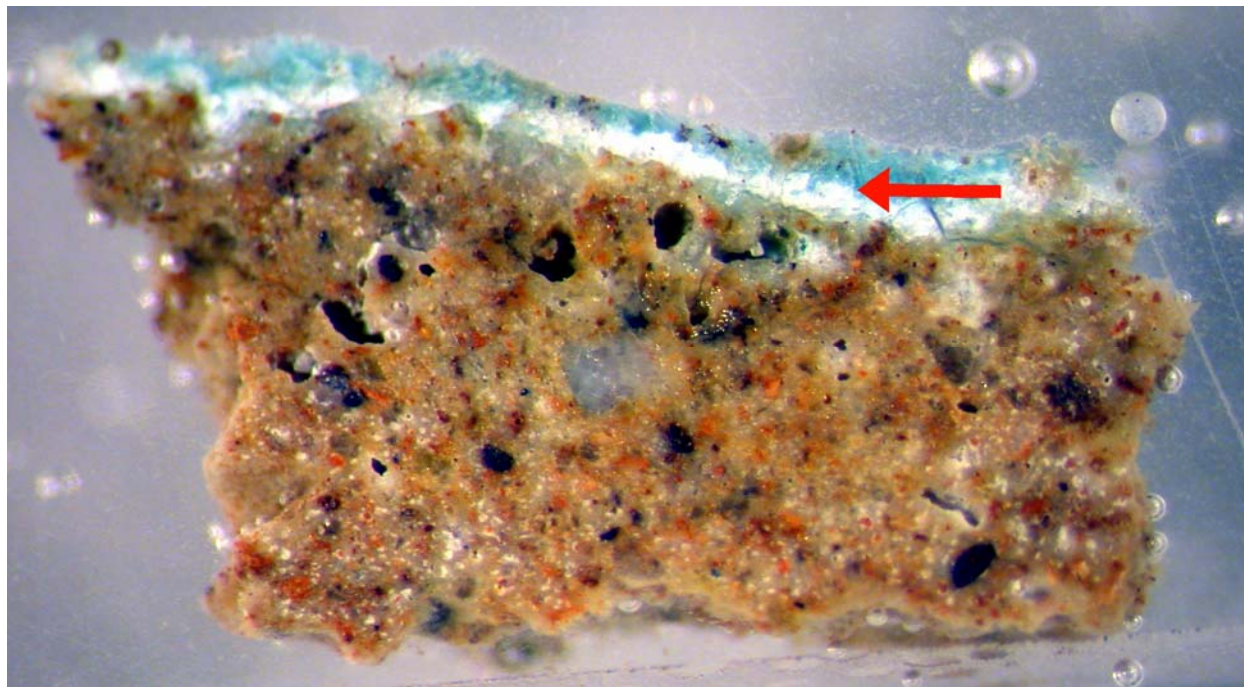


Figure 9. Cross section of blue glaze showing layering of white glaze underneath (see arrow). The reason for this layering is unclear; however, one theory suggests that white glaze was applied first in order to manipulate the tone of the final blue glaze. Magnification: 45x. Sample taken from glazed clay brick, Sin Temple, Khorsabad, Iraq, 722-705 BC, Oriental Institute Museum, OIM A11810.147.

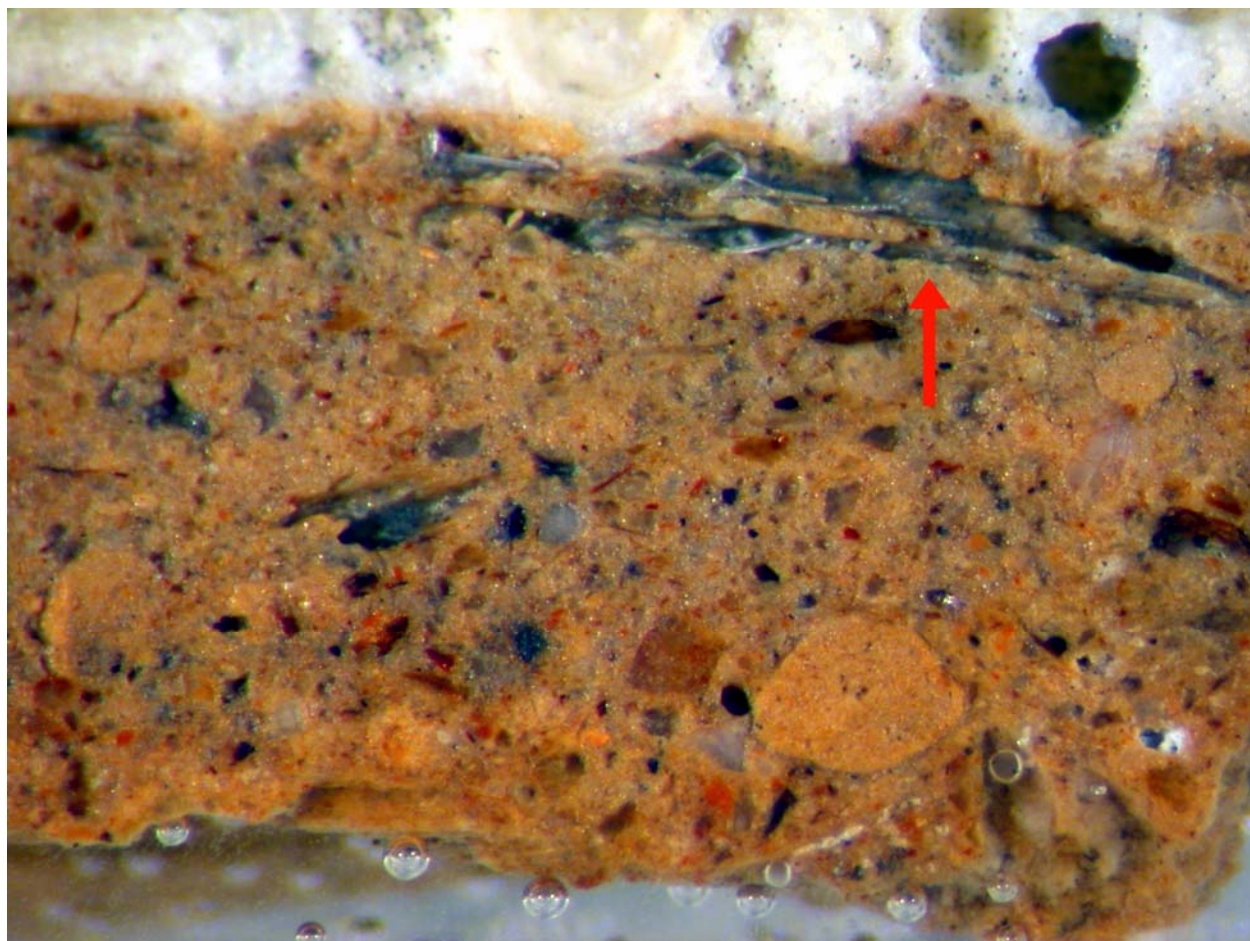


Figure 10. Detail of brick fabric showing possible evidence of plant fibers (see arrow). Vegetal material would have been added to the clay to improve its working properties and to prevent cracking. During firing, most of the fibers would burn leaving casts of their original form preserved in the brick. Magnification: 30x. Sample taken from glazed clay brick, Sin Temple, Khorsabad, Iraq, 722-705 BC, Oriental Institute Museum, OIM A11810.146.

3. Conservation Treatment



Figure 11. A crate before opening.



Figure 12. In 1990, one crate was opened and the bricks were removed for examination. The bricks were in a very fragile and fragmentary condition. Consolidation tests were conducted on these bricks to determine which consolidant was most effective. The bricks had also been treated in the field with a cellulose-nitrate based adhesive (“Ambroid”; Loud 1933), and the tests would help determine the compatibility of the modern resin with the aged cellulose-nitrate consolidant. Glazed clay brick, Sin Temple, Khorsabad, Iraq, 722-705 BC, Oriental Institute Museum, OIM A11810.158.



Figure 13a (left) & b (right). In 2002, a crate containing the bricks belonging to the bull's head was opened. The fragile condition of the bricks was immediately apparent upon opening the crates. Preliminary cleaning and stabilization of the glazed surfaces was executed at this time. Based on the results of the 1990 consolidation tests, Acryloid B72 was chosen for both the adhesive and consolidant. Loose brick and glaze fragments on the exposed surface were tacked in place using HMG Acryloid B-72 adhesive. Friable areas of the glazed surface were consolidated with a 1.5-3% solution of B-72 in 1:1 acetone:ethanol. The glazed surface was vacuumed to remove soil and brick dust. Gauze was placed over the nozzle of the vacuum to collect any material removed. This material was placed in glass vials for future analytical work. Glazed clay bricks, Sin Temple, Khorsabad, Iraq, 722-705 BC, Oriental Institute Museum, OIM A11810.149-152 and A11810.154-157 (left) and OIM A11810.265-266 (right).

**A****B****C****D**

Figure 14. A method similar to block lifting was devised to remove the bricks from the crates. Gauze was dipped into dental plaster (a), and draped over two exposed brick sides, which had been protected with polyethylene film and, in some cases, aluminum foil (b and c). The bricks were rotated onto a reinforced side, and a second long side was similarly treated (d). Finally, secure in their plaster support, the bricks were lifted from the crate.



Figure 15. Excess dirt was removed from each brick by both brush-vacuuming and lightly swabbing with 1:1 ethanol:deionized water where necessary. The bricks were then consolidated several times with a 3-5% solution of Acryloid B-72; after each consolidation, the pieces were placed in polyethylene bags to retard solvent evaporation. Glazed bricks, Sin Temple, Khorsabad, Iraq, 722-705 BC, Oriental Institute Museum, OIM A11810.147.



Figure 16. Finally, the stabilized fragments were joined with HMG Paraloid B-72. Glazed clay brick, Sin Temple, Khorsabad, Iraq, 722-705 BC, Oriental Institute Museum, OIM A11810.158.

**A****B****C**

Figure 17. Many bricks were missing large sections of their original backs. As the display called for stacking them on top of one another, false backs were constructed for additional support and to better approximate the ancient appearance. Thick planks of Ethafoam® were carved to fit the break edge contours of individual bricks; the depth of the backs was cut to match the few intact bricks (A). The Ethafoam® was coated with a layer of regular dental plaster (B). Before fully curing, the plaster-coated foam was pressed against the back of the brick, protected with polyethylene film, to ensure that the topography of both halves still matched. Lascaux® Modeling Paste B, an acrylic, coarse-textured paste, was applied to the plaster in order to imitate the texture of the original surface. The foam backs were tacked onto the bricks using 50% Acryloid B-72 in acetone, bulked with 3M™ Scotchlite™ Glass Bubbles. Finally, the backs were toned with Liquitex© Acrylic paints to better integrate with the bricks (C).



Figure 18. The façade, after treatment, mounted in the exhibition case. Glazed bricks, Sin Temple, Khorsabad, Iraq, 722-705 BC, Oriental Institute Museum, OIM A11810.147-150, 156-158, 163.



Figure 19. Reconstruction drawing of the bull figure (from Place 1870). The drawing helps clarify what the head of the bull, seen in Fig. 18, looks like.

Acknowledgements

The authors wish to thank Laura D'Alessandro, Karen Wilson, Ray Tindel, Gil Stein, Ian Steele, Markus Dohner, Erik Lindahl, Joey Corbett, Joe Scott and Vicki Parry

Suppliers

Acryloid B72 (ethyl methacrylate copolymer):

Talas, 20 West 20th Street, 5th Floor, New York, NY 10011, (212) 219-0770.

(<http://talasonline.com>)

Epo-Thin Low Viscosity Epoxy Resin (No. 208140032 – resin, No. 08142016 – hardener),
Isomet 1000 Precision Saw, Isocut Cutting Fluid (No. 112293016), Metaserv 2000
Grinder/Polisher, Carbimet Discs (No. 305128):

Buehler 41 Waukegan Rd., Lake Bluff, IL 60044, (847) 295-6500/1-800-283-4537.

Ethafoam® (polyethylene close cell foam):

Republic Packaging, 9160 South Green Street, Chicago, IL 60620, (773) 233-6530,

(www.corrugated.com)

HMG Acryloid B72 (ethyl methacrylate copolymer in acetone):

Conservation Resources International, 5532 Port Royal, Springfield, VA 22151, (800) 634-6932,

(www.conservationresources.com)

Lascaux© Modeling Paste B (coarse):

Dick Blick Art Materials, P.O. Box 1267, Galesburg IL, 61402-1267, (800) 828-4548,

(www.dickblick.com)

Liquitex© Acrylic Paints:

Pearl Fine Art Supplies, 255 W. Chicago Ave., Chicago, IL 60610, (312) 915-0200,

(www.pearlpaint.com)

3M™ Scotchlite™ Glass Bubble, Product K15:

3M Specialty Materials, 3M Center Building 223-6S-04, St. Paul, MN 55144-1000,

(800) 367-8905

Regular Dental Plaster:

Lance Gypsum Products, 4225 Ogden Ave., Chicago, IL 60623, (773) 522-1900,

(www.lancegypsum.com)

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Oriental Institute Archives. Courtesy of the Oriental Institute, University of Chicago.

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