Owner:	Princeton University Art Museum (PUAM)
Object Number:	2004-203
Artist/Maker:	Unrecorded maker, Late Roman
Object:	Corinthian pilaster capital with frontal face
Date:	4th – early 5th century, A. D.
Medium:	Marble
Dimensions:	h. 25.8 x w. 34.5 cm, d. 4.5 cm (10 3/16 x 8 7/8 x 1 3/4 in.)
Provenance:	Excavated by the Princeton-led team at Antioch on the Orontes; present-day Antakya, Turkey, 1934; with the Museum since 1939.
Examiner:	Daisy Diamond (Objects Conservation Summer Intern, PUAM; Graduate Fellow, Winterthur/University of Delaware Program in Art Conservation (WUDPAC), Class of 2026)
Consulted:	Elena Torok (Associate Objects Conservator, PUAM) Carolyn M. Laferrière (Assistant Curator of Ancient Mediterranean Art, PUAM) Jeff Evans (Manager of Visual Resources/Photographer, PUAM)
Proposal Date:	June 10th, 2024

Description

This object is a white marble architectural relief of the Corinthian order. Symmetrical carved ornamentation includes, from top to bottom: a central beardless face with recessed pupils, a central palmette with a stem that splits into two volutes, and two half acanthus leaves divided by a single egg. The carved elements range from ⅛ to 1 ¾ cm in height with hollowed channels underneath seven tips of the acanthus. A gray-brown impurity is diffused within the majority of the egg motif. Deeply embedded mottled brown regions of the stone appear to be impurities on the upper PR and PL front of the capital (fig. 1).[1] Polishing is evident in reflective areas less obscured by soiling. On the planar surfaces of the capital's back and underside, linear chisel marks are apparent.

[1] Left image documented through the eyepiece of a Leica M80 Stereomicroscope with an iPhone 15, ISO 125, f1.6, 1/60s, June 2024. Right image courtesy Jeff Evans, July 2024.

Figure 1. Brown material on the stone. Micrograph (left) and reference image (right).

Historical context

Antioch on the Orontes was a Hellenistic Greek city founded in 300 B.C. at the crossroads of trade routes in present-day Antakya, Turkey (fig. 2). Antioch was also an important Roman military, commercial, and religious center with temples, palaces, theaters, and other public buildings. The city underwent multiple conquests over time (Columbia Encyclopedia 2018). For a term beginning in 1931 and ending in 1939 with the outbreak of World War II, the Princeton Department of Art and Archaeology led four campaigns of exploration and excavation of Antioch (Department of Art and Archaeology 2016). Three fragments of this capital were excavated in the summer of 1934 from section 24-L, Dig D, Room 2 of the Necropolis of Mnemosyne (Southeast Cemetery) of the Sari-Mahmoud District (fig. 3-5; see p. 4: "Previous Treatment") (OCHRE, Department of Art and Archaeology 2016). The capital was recorded under the label "3610-A31" and entered the museum collection in 1939 (OCHRE). This capital may have been carved with pointed or flat chisels, smoothed with abrasive materials, and was likely part of a larger architectural monument. Comparable examples of Corinthian capital fragments are held within the PUAM collections (figs. 6-7).

Figure 2. Antioch, ancient Syria (modern-day Turkey). Image courtesy Encyclopædia Britannica, Inc.

Figure 5. Field documentation before reassembly, June 1934. Image courtesy Princeton: Committee for the Excavation of Antioch and its Vicinity. (1941).

Figure 3. General view of building in Dig D with geometric mosaic pavements, facing NE. Image courtesy Princeton, 1935 (Department of Art and Archaeology 2016).

Figure 4. General view of Dig D, Rooms 1 and 2, facing N. Image courtesy Princeton, 1935 (Department of Art and Archaeology 2016).

Figure 6. Corinthian pilaster capital fragment (5th century, A.D.). Antioch on the Orontes, present-day Antakya, Turkey. White marble. Image courtesy PUAM (2004-196).

Figure 7. Corinthian pilaster capital fragment (5th century, A.D.). Antioch on the Orontes, present-day Antakya, Turkey. White marble. Image courtesy PUAM (2004-198).

Previous treatment

The three fragments were reassembled in the field. At present, the repair material is stable when handled. The composition of this highly fluorescent material is unknown (fig. 8).[2] The use of metal or stone pins is also unknown, but could be evaluated at a later date with X-radiography. All joins are filled and inpainted to loosely match the marble surroundings. This object may have been cleaned in the field, but the extent of cleaning is undocumented.

Figure 8. Longwave (365nm) ultraviolet (UV) fluorescence.

Condition

The pilaster capital is structurally stable and in fair aesthetic condition. The aesthetic condition is compromised by dark-gray markings, overall surface soiling, and wear consistent with the archaeological history of the object (fig. 9).[3]

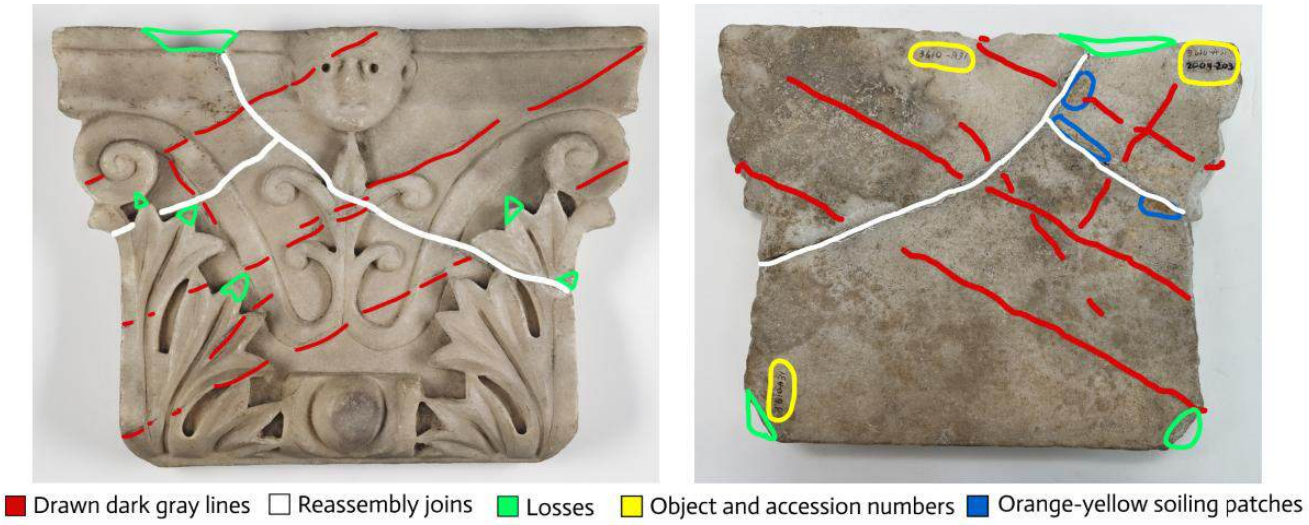

Figure 9. Condition diagram of the front (left) and back (right) of the Corinthian pilaster capital.

[2] Documented with an iPhone 15, ISO 640, f1.6, 1/30s, June 2024. Light source: Antari DarkFX Wash 2000 light source (peak 365nm).
[3] Left image courtesy Jeff Evans, June 2024. Right image documented with an iPhone 15, ISO 64, f1.6, 1/120s, June 2024.

The object is disfigured by four groupings of prominent dark gray linear marks of unknown origin (fig. 10).[4] These marks appear consistent with pencil or graphite and wrap around the front; back; and PR, PL, and upper sides of the capital. The lines are not present in the 1934 photo documentation, and were thus applied to the surface after excavation, perhaps during public display.

Figure 10. Detail (left and center) and overall (right, detailed in red) images of dark gray marks on the surface.

Significant post-excavation dirt and grime have accumulated from museum storage and display. There are two layers of soiling. The top layer is gray and consistent with museum display and storage, with larger deposits in recessed areas and upward facing surfaces. Below this, there is scattered brown soiling in a more deeply embedded film layer. It is possible this could be from an archaeological context. Additionally, dark staining discolors some of the break edges in contact with the fill material. The back of the capital has thicker, dark brown areas of soiling and orange-yellow patches of accretions. In the most protruding topography of the back of the capital, the material appears burnished with soiling. In the center of the upper side, a single central hole approximately 9/10 cm in diameter was drilled, potentially for mounting purposes in antiquity or museum contexts (fig. 11).[5] Soiling embedded within this hole is consistent with the exterior of the object and some corrosion staining is present near the opening.

Figure 11. Drilled hole, center upper side.

Some acute protruding angles exhibit granular disintegration with minor crumbled edges and losses consistent with the archaeological history of the object. This capital may have historically included polychromy, but there is no evidence of polychromy at the present. However, additional imaging and examination would support this assessment. There are four object and accession numbers on the back: “3610-A31” is present on each of the three joined components from labeling in the field, and “2004-203” was applied on the upper PR as the PUAM accession number.

[4] Left image documented with an iPhone 15, ISO 32, f1.6, 1/133s, June 2024. Center image documented with an iPhone 15, ISO 50, f1.6, 1/418s, June 2024. Right image courtesy Jeff Evans, June 2024.
[5] Documented with an iPhone 15, ISO 32, f1.6, 1/78s, July 2024.

Purpose of Treatment

The purpose of this treatment is to re-establish aesthetic legibility of the pilaster capital for reinstallation in the new PUAM Ancient Mediterranean Pavilion.

Treatment Proposal

1. Complete before treatment photo documentation, including standard photo documentation and visible induced infrared luminescence (VIL) and UV imaging to evaluate presence of polychromy (est. 1.5 hours).
2. Initial dry surface clean front and back to reduce loose soiling (1 hour).
3. Reduce drawn dark gray lines on the front and back following testing with dry cleaning methods and progress to aqueous or solvent-based cleaning methods, as needed (5 hours).
4. Following testing, reduce the overall level of surface grime with dry cleaning methods. Progress to aqueous or solvent-based cleaning methods to the extent established with curatorial input (2 hours).
5. If deemed aesthetically necessary, improve the appearance of the fill with reversible materials (1 hour).
6. Complete after treatment photo documentation and treatment report (est. 1 hour).

Estimated treatment time: 11.5 hours

Treatment Procedure

1. Completed before treatment photo documentation, including VIL and UV examination (1 hour).
2. Investigated the surface of the capital with stereomicroscopy to evaluate polychromy (0.5 hours).
3. Reduced loose soiling on all sides of the capital with a low-speed HEPA filtered Festool CT Mini vacuum and cosmetic sponges (0.5 hours).
4. Completed surface tests for removal of dark gray drawn marks (refer to table 1, 0.5 hours).
5. Reduced drawn dark gray lines on the front and back of the capital with a dry Mars STAEDTLER eraser, followed by a Mars STAEDTLER eraser in deionized (DI) water or 1:1 DI water:ethanol applied with swab as needed. Eraser crumbs were cleared with a low-speed HEPA filtered Festool CT Mini vacuum (6 hours).
6. Deeply embedded marks were further reduced with 4% agar gel (Sigma Aldrich 05040 Agar powder for microbiology) followed by mechanical reduction with aforementioned methods (1 hour).
7. Surface cleaned the front of the capital with a dry Mars STAEDTLER eraser, followed by 1:1 DI water:ethanol applied with swab as needed to remove soiling from storage and display environments. Established a consistent overall level of soiling (2 hours).
8. Completed after treatment photo documentation (0.5 hours).

Total treatment time: 12 hours
Report Date: July 26th, 2024

Future Storage and Display

At present, the structural condition is stable. This may change over time, and supports from the underside as well as on the top are recommended for vertical display conditions.

Treatment Results and Justification

This treatment was successful and followed the proposed treatment procedure. Before completing surface cleaning, the object was examined to determine if there was any polychromy through standard microscopy, VIL, and UV examination with Elena Torok, Associate Objects Conservator and Jeff Evans, Manager of Visual Resources/Photographer at PUAM. No evidence of pigments was detected. VIL documents the luminescence of Egyptian blue when illuminated by discrete bands of visible electromagnetic radiation. No Egyptian blue was detected on this object (fig. 12). Ideally, full multiband imaging (MBI) would have been performed to look for additional pigments, but additional MBI set-ups were not accessible at this time.

Figure 12. VIL set-up (left) and negative VIL image with an Egyptian blue target (right).

Carolyn M. Laferrière, Assistant Curator of Ancient Mediterranean Art at PUAM and Elena Torok were consulted to establish the extent of cleaning, given that no polychromy was detected. Dark gray marks were reduced as much as possible. In the most stubborn areas, breaking up the lines was prioritized over complete removal, which would have risked overcleaning or halo effects. Various methods for reducing the dark gray marks and surface soiling were tested (table 1). A combination of methods were employed depending on the extent of drawn material deposited, the porosity of the stone, and the accessibility of the mark (fig. 13).[6] Particularly stubborn areas of dark gray marks were reduced with gel cleaning (figs. 14-15).[7] Inpainting incongruous fills was discussed with Carolyn M. Laferrière. This was determined to be unnecessary at this time as the imperfect match was deemed acceptable and useful for distinguishing modern repairs.

[6] Left image documented with an iPhone 15, ISO 32, f1.6, 1/133s. July 2024. Right image documented with an iPhone 15, ISO 40, f1.6, 1/151s, June 2024.

[7] Figure 14 left image documented with an iPhone 15, ISO 50, f1.6, 1/374s, June 2024. Figure 14 right image documented with an iPhone 15, ISO 50, f1.6, 1/396s, June 2024. Figure 15 left image documented with an iPhone 15, ISO 40, f1.6, 1/182s, June 2024. Figure 15 right image documented with an iPhone 15, ISO 32, f1.6, 1/120s, July 2024.

Table 1. Surface tests for removal of drawn marks.

Surface cleaning technique	Efficacy
Cosmetic sponge	Barely lifts the soiling.
DI water swab	Lifts slightly more soiling than cosmetic sponge.
Mars STAEDTLER eraser	Reduce dark gray marks, but can create a halo effect. Requires 15 minutes of mechanical action per inch of drawn line in some areas. Requires clearing of eraser crumbs.
Mars STAEDTLER eraser with DI water	Significant and rapid reduction of marks with a minimal halo effect. Less pressure is required than dry eraser cleaning. Most effective on very smooth areas of stone with low soiling. Requires clearing of eraser crumbs.
Mild enzymatic solution (saliva) cleared with DI water	Significant reduction of marks. Can result in smudging and more patchy boundaries than the eraser.
1:1 DI water:ethanol applied with swab	Lifts soiling without going to pure marble, reduces graphite slightly. No hazing observed.

Figure 13. Before (left) and after (right) reduction of drawn marks with Mars STAEDTLER eraser in DI water located on the front, PR acanthus leaf.

Figure 14. Areas with stubborn dark gray marks targeted with gel cleaning, indicated by red arrows; during treatment.

Figure 15. Before (left) and after (right) gel cleaning. Note: lighting conditions varied between these two images.

Lastly, overall surface soiling was reduced from the front and back of the capital to minimize halos and reduce museum dust and dirt. After this treatment was completed, the graphite marks were not notable, and the variation within the stone due to natural inclusions was no longer obscured by a thick layer of museum dust and dirt.

Before Treatment Photo Documentation

Images captured with a Phase One IQ4 280 by Jeff Evans on June 14th, 2024 (figs. 16-17). All metadata is included in TIFF files in PUAM image records.

Figure 16. Before treatment, overall front.

Figure 17. Before treatment, overall back.

After Treatment Photo Documentation

Images captured with a Phase One IQ4 280 by Jeff Evans on July 15th, 2024 (figs. 18-19). All metadata is included in TIFF files in PUAM image records.

Figure 18. After treatment, overall front.

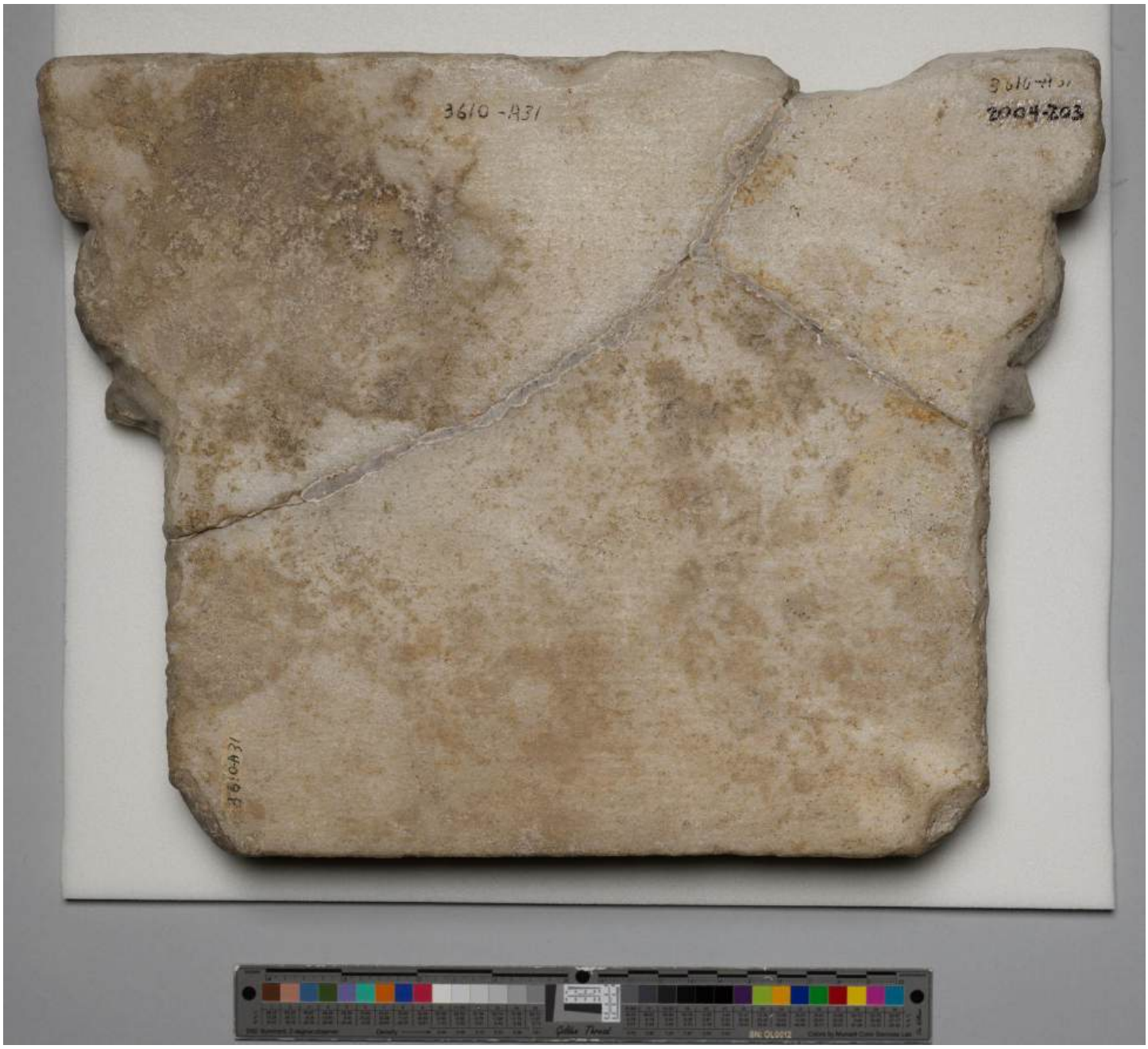

Figure 19. After treatment, overall back.

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