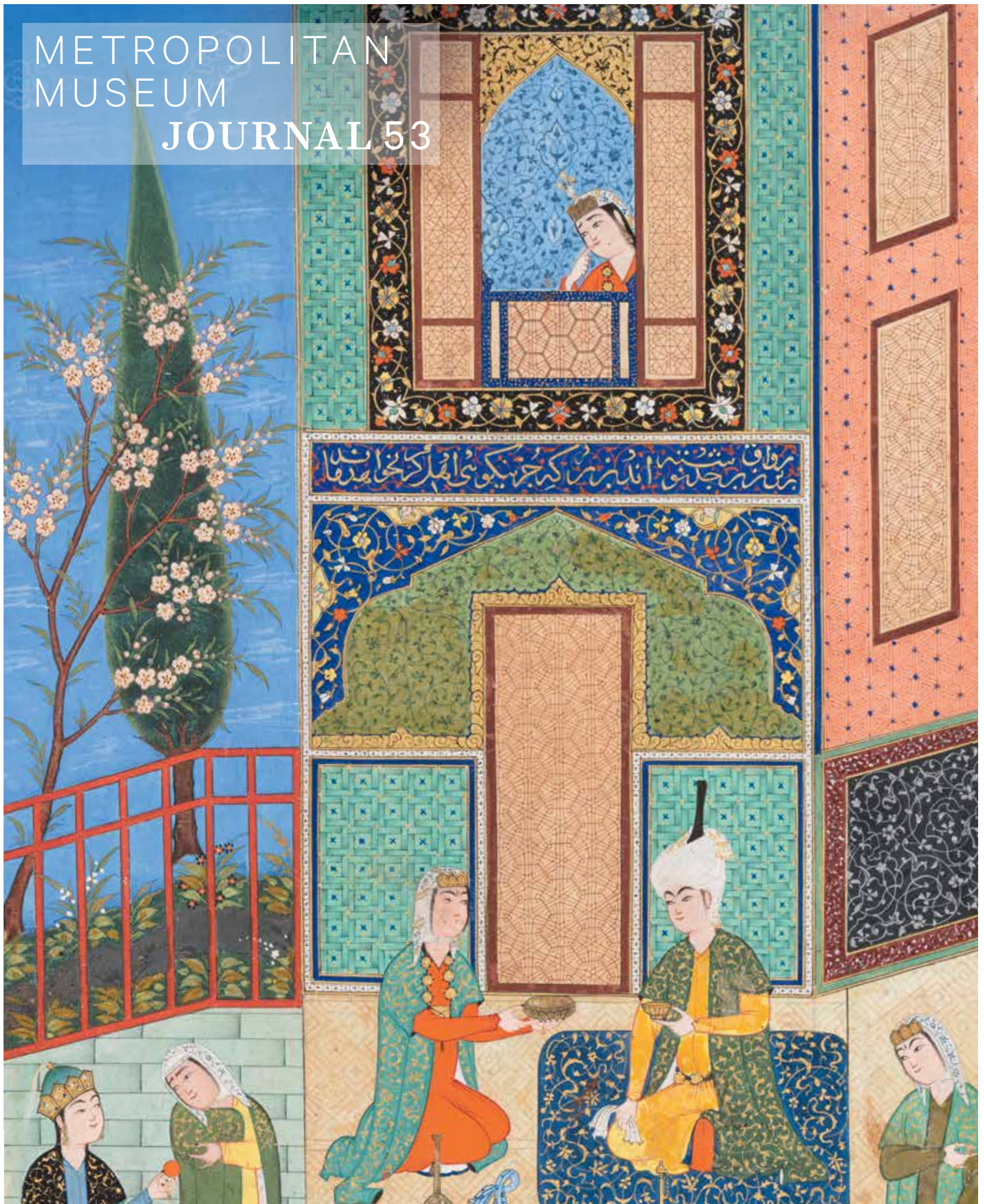


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Opposite: Attic red-figure bell-krater attributed to the Persephone Painter. Greek, ca. 440 B.C. Terracotta, H. 16½ in. (41 cm). The Metropolitan Museum of Art, Fletcher Fund, 1928 (28.57.23)

For Joan Mertens

IN HONOR OF HER YEARS OF DEDICATION TO THIS PUBLICATION
AND HER EXEMPLARY ERUDITION, GENEROSITY, AND WIT



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ABBREVIATIONS

MMA The Metropolitan Museum of Art
MMAB *The Metropolitan Museum of Art Bulletin*

MMJ *Metropolitan Museum Journal*

Height precedes width and then depth in dimensions cited.

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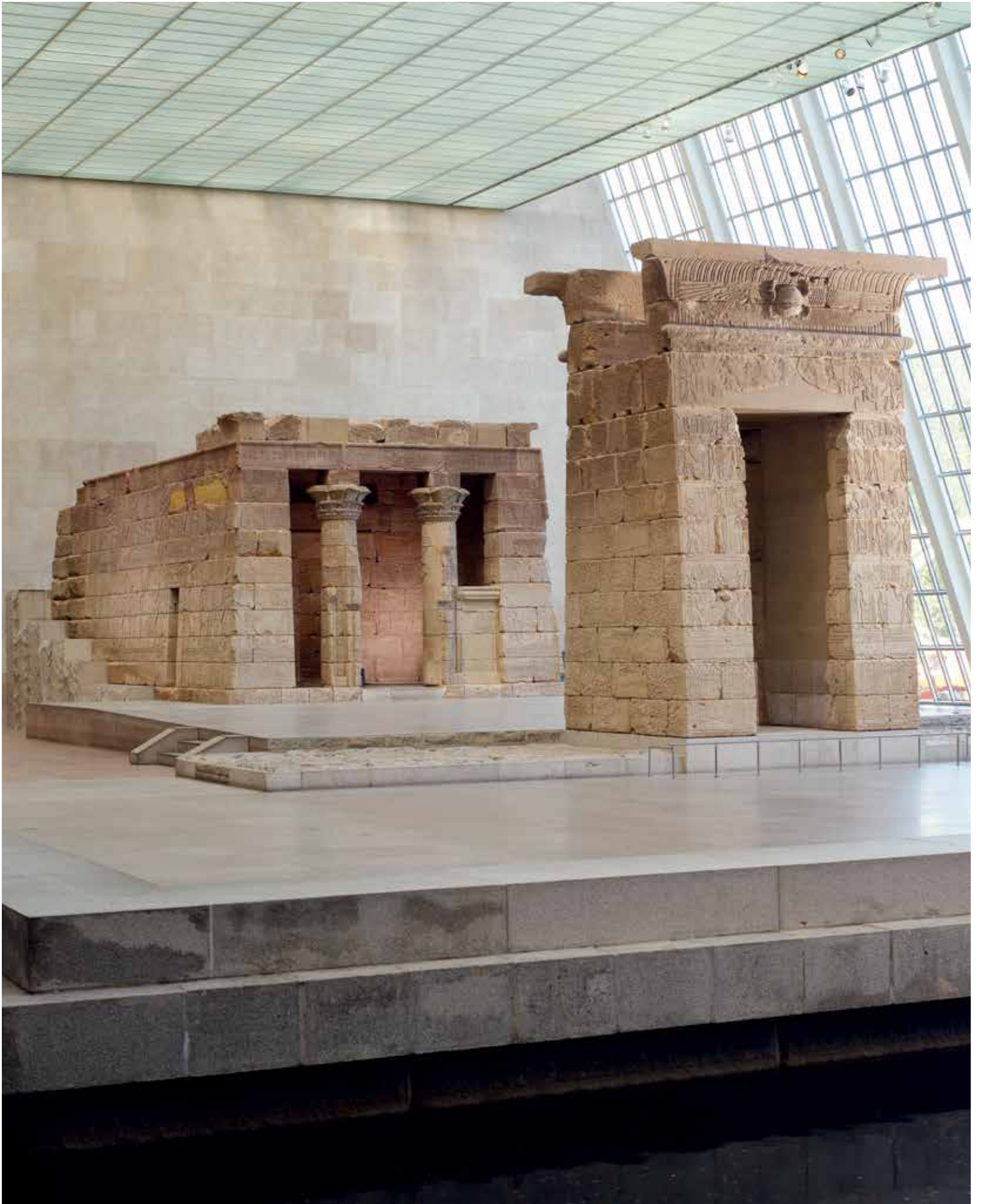
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ERIN A. PETERS

Coloring the Temple of Dendur

Although modern visitors to the Temple of Dendur at The Metropolitan Museum of Art may be struck by the austere majesty of its bright sandstone, ancient visitors would have seen its surface gleaming with brilliant paint (fig. 1). Dendur, like most temples in Egypt and the rest of the ancient world, would have been lavishly painted. Efforts to restore the polychrome splendor of ancient art have come to the forefront in the last decade with a number of popular exhibitions, international academic conferences and publications, and conservation and digital restoration projects.¹ These recent studies have demonstrated that color was an important indicator of value and meaning—a generalization that holds true for sculpture and architecture in Egypt throughout the Roman period (30 B.C.–A.D. 330).

Vibrant polychromy was essential to art and architecture throughout the history of Egypt from the Early

fig. 1 Temple of Dendur. Roman period, reign of Augustus (27 B.C.–A.D. 14), completed by 10 B.C. From Egypt, Nubia, Dendur. Aeolian sandstone, Temple proper H. 21 ft. (6.4 m); W. 21 ft. (6.4 m); L. 41 ft. (12.5 m). Given to the United States by Egypt in 1965, awarded to The Metropolitan Museum of Art in 1967, and installed in The Sackler Wing in 1978 (68.154)

Dynastic period through the Roman period. Beyond its visual effect, color contributed to a temple's function as a microcosm of the universe and ideal dwelling place for a deity. Polychromy in temples had a highly symbolic role that was distinctive to its environment and differed from that of funerary and other contexts. In the painted surface of the temple, particular colors stood for certain precious stones and minerals, which held a variety of associations.² In addition, the minerals used in the pigments themselves evoked the specific material, as did the pigments' richness and luminosity, enhanced by gum binders that gave them greater depth.³

Dendur is one of many temples built or expanded under Octavian, who annexed Egypt as a Roman province in 30 B.C. and became the first Roman emperor after accepting the title of "Augustus" from the Senate in 27 B.C. The temple complex was built before 10 B.C. at the ancient site of Tutziz, located approximately fifty miles south of Aswan.⁴ Dendur and its local cult—which focused on two enigmatic figures, Pedesi and Pihor, who may have been the deified sons of a local Nubian chieftain—were essential to establishing a regional cultic identity centered on the goddess Isis and her powerful Temple at Philae, north of Aswan, in the border region between southern Egypt and northern Nubia. Pedesi and Pihor's relationship with Isis, a chief deity in both the Nubian and Egyptian pantheons, is a major theme in the reliefs at Dendur, where Isis was worshipped as patroness of the region.⁵

One of the reliefs was recently the focus of a project undertaken to evoke the Temple of Dendur's original polychromy and illuminate more of its ancient context for Museum visitors. In 2013 the Department of Egyptian Art and the Digital Department embarked on a collaboration to research and create a virtual reconstruction of the scene depicted on the relief for projection onto the temple. Located on the southern exterior wall, the scene highlights Dendur's importance in the region, showing Augustus as pharaoh in traditional kingly garb, including the crown of Lower Egypt surmounted by the atef crown with horns and a short, starched triangular kilt (fig. 2). Augustus's Egyptian praenomen *nswt biti* (or "Autocrator," Greek for "emperor") and nomen *sa Ra* (or "Kaisaros," Greek for the Roman title "Caesar") are enclosed in cartouches above his head. He extends both arms, bearing jars of wine, over a throne-shaped offering table stacked with cakes and jars. The god Horus (in his form of Harendotes) and the goddess Hathor stand to the left and receive the offerings. They appear in local forms associated with the specific geographic region of which

Dendur was a part, as indicated by their hieroglyphic epithets: "Horus (Harendotes, he who protects his father), son of Isis, son of Osiris, Lord of the Abaton and Philae," and "Hathor, great one, mistress of Biga, Eye (and Daughter) of Ra, Lady of Heaven, Mistress of all Gods." The hieroglyphic references to the regional sites of the Abaton and Biga underscore Dendur's ritual connection to Philae.

To begin research for the projection, the temple was examined for any pigment visible to the naked eye. None was found, largely owing to the temple's flooding during the various raisings of the Aswan Dam, from 1899 until completion of the Aswan High Dam in 1970. Technical imaging was then carried out to determine if any pigment could be detected outside the visible light range. Museum conservators utilized visible-induced infrared luminescence (VIL) imaging to identify the presence of Egyptian blue, which has a characteristic luminescence in the infrared range that can appear even when minute traces of the pigment remain. Testing began with VIL imaging because Egyptian blue is a hardy pigment and remains on surfaces even when others do not, making it a good baseline. No remaining Egyptian blue was detected in the initial examination. Conditions were less than ideal because of the in-gallery setting and the amount of natural light that filters through the northern glass wall, and at the time conservators were unable to access the temple's higher areas, where pigments were more likely to have survived partial flooding. A second examination was conducted in 2017, during cleaning in preparation for the celebration of the fiftieth anniversary of the awarding of the temple to the Museum.⁶ All surfaces were visually inspected for remaining pigment and VIL imaging was again carried out, but as in the first testing, no pigment was found.

Because no verifiable pigment data emerged from these conservation analyses, it was determined that the reconstruction could only be hypothetical, presenting an example of how Roman-period temple painting in Egypt might have looked. This article documents the research undertaken to inform the digital re-creation.

A general survey of studies dealing with polychromy in Egypt revealed that most do not concentrate on Dendur's specific context and time period. The research team therefore turned to data from records of paint remaining at Dendur in 1911, from extant Roman-period temples in Egypt, and from objects associated with temple environments in museum collections. Their investigation revealed a number of elements that are specific to temple painting in the Roman period,



fig. 2 Relief carving of Augustus offering to Harendotes and Hathor. Temple of Dendur, lower register of exterior southern wall

differing from those of earlier periods and non-temple contexts. These elements relate to general color palette and coloration of figures; color symbolism; patterns and complexity of regalia and crowns; technical execution of these patterns; use of a white gesso ground; and coloration and state of preservation of hieroglyphs.

Based on the new evidence and interpretation from this research, a digital color version of the scene's decoration was created and projected onto the temple through projection mapping technology, giving a vivid sense of Dendur's painted appearance in antiquity. The project demonstrated the flexibility and nimbleness of digital productions, which can be easily updated. Ultimately, the projection enhanced the visitor's experience of the temple by evoking the essential role of color for ancient art and architecture.

POLYCHROMY IN EGYPT

Although the scholarly study of polychromy in Egypt has produced a wealth of knowledge and literature, the majority of studies do not focus on temple contexts that date to the Roman period. Rather, most center on painting in pharaonic-period papyri, mummy cases, royal and nonroyal domestic architecture, and tombs. Some of the best-preserved examples of polychromy in Egypt come from tombs—especially those dating to the New Kingdom (ca. 1550–1070 B.C.), because of the abundance of remaining evidence—and tomb painting has often been used as the standard measure of polychromy for Egyptian objects.⁷ Preferred research topics

in studies of Egyptian polychromy have been the use of materials, such as pigments and binders, and symbolism in relation to color, image, and language.⁸

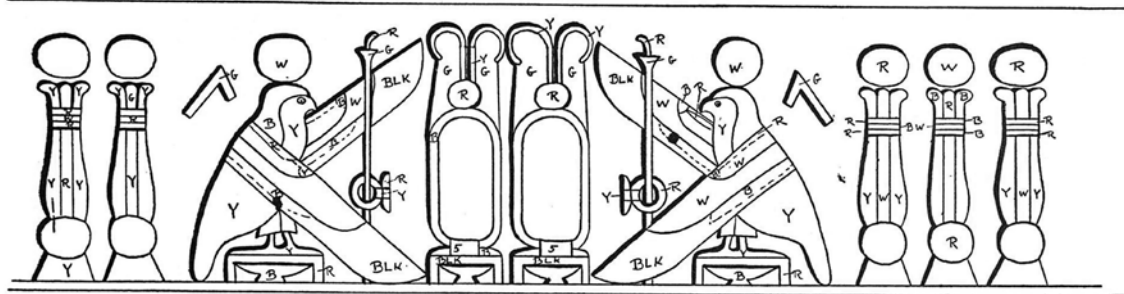
Examination of pigments in Egyptian art and architecture has yielded technical data about the color palettes employed in specific periods, as well as information about changes in pigments' physical makeup and appearance over time. Pigment analysis has suggested that the main color palette for painting in Egypt did not change much until the Roman period, about the first century A.D.⁹ Until then, the palette included black, brown, blue, white, orange, gray, yellow, red, pink, and green.¹⁰ Although the color pink is generally thought to be a Ptolemaic (332–30 B.C.) development,¹¹ it was used as early as Dynasty 19 (ca. 1295–1186 B.C.), in the mortuary Temple of Sety I at Abydos.¹² Analysis initially indicated that vermilion, red lead, and green earth were introduced in the Roman period, causing a change of variation of hues in the color palette.¹³ However, it is possible that these pigments also existed in earlier periods but were used more exclusively in the Roman period.¹⁴ In addition to variations of color palettes over time, pigments and binders could degrade and change physical makeup and appearance.¹⁵ Paint surviving today may look different from how it appeared in antiquity. Nevertheless, it is generally accepted that the primary color palette in the pharaonic period included black, blue, white, yellow, red, and green, and that a larger variety of pigments to create these colors was used in the Roman period.

Wolfgang Schenkel and John Baines have proposed that in the ancient Egyptian language, at least from the Old Kingdom (ca. 2649–2150 B.C.) into the Roman period, the primary color palette was grouped in four basic color categories: *km(m)*, or black colors; *bd*, or white; *dšr*, or red; and *w3d*, or Grue (green/blue). In addition to these basic categories, the word *s3b* could mean variegated, multicolored, or textured when used in reference to animal or reptile skins, or birds' plumage.¹⁶ These terms did not necessarily refer to the actual appearance of the colors but might instead imply their symbolic category. For instance, the word *w3d* had particularly strong symbolic associations with freshness, vigor, papyrus, growth, and the resurrection of Osiris,¹⁷ and there are examples of non-naturalistic uses of green/blue in deities' skin and the White Crown of Upper Egypt in Middle Kingdom (ca. 2030–1640 B.C.) coffin texts, to reference freshness or vitality.¹⁸ Additionally, the four basic color categories had a range of meanings that could change when combined with other colors, or when used to refer to a secret or

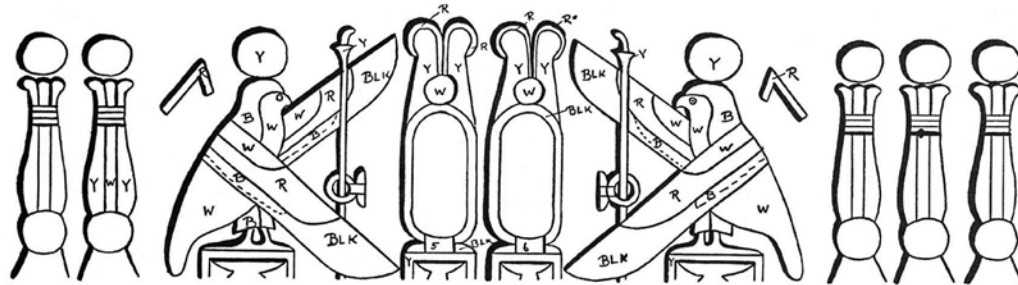
negative nature of the object colored, as was frequently the case with *dšr*, or red.¹⁹ The symbolic use of colors, and the words and phrases used to denote or invoke them, was particularly salient and strategic in temple painting, as distinguished from painting in other media and in tombs or other locations.²⁰

Nevertheless, painting has received little attention in scholarship on Ptolemaic- and Roman-period temples, which has focused more on architectural form, style of reliefs, and language and texts.²¹ In the primary studies of architecture in the Ptolemaic and Roman periods, color and painting are briefly mentioned, with general notations about the more “pastel” palette of the Ptolemaic period, as compared to the earlier

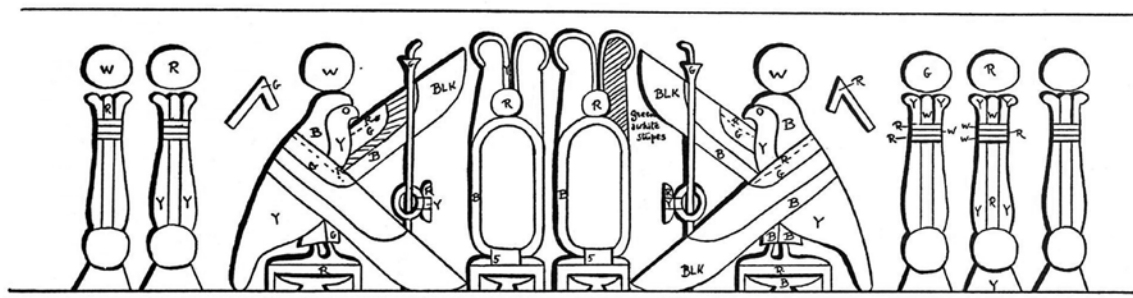
pharaonic periods.²² In one recent detailed study of Ptolemaic- and Roman-period painting, Dieter Kessler also makes the overarching statement that the color palette became more pastel.²³ Working from this premise, Kessler’s objective in his documentation of Ptolemaic painting at the animal cemetery at Tuna el-Gebel is to “demonstrate that the traditional Egyptian canonic colour system begins to recede in the time of the new Greek Ptolemaic rulers.”²⁴ His specific evidence of the canonical color system receding toward a generally more pastel palette is that the White Crown of Upper Egypt worn by Ptolemy I (304–284 B.C.) is painted yellow throughout an ibis tomb at the cemetery.²⁵ This choice of color is a



East Wall. A. (North Section.)



East Wall. B. (Central Section.)



East Wall. C. (South Section.)

fig. 3 Color notations and drawing of the frieze decoration in the pronaos of the Temple of Dendur. From Blackman 1911, pl. 120



fig. 4 The central axis in the pronaos at the Temple of Hathor, Dendera, Egypt, showing extant polychromy

significant departure from the pharaonic period, when the White Crown was so called because one of its names was the ancient Egyptian word for the color white, *ḥd*.²⁶ After proposing a number of possible explanations, Kessler argues that the change in canonical color scheme caused a general loss of color symbolism, and can be credited to the painters' lack of understanding or proper training.²⁷

However, changes in the canonical color scheme have been identified as far back as the pharaonic period, and with a range of deeper explanations. As mentioned above, as early as the Middle Kingdom, the White Crown was called *w3d*, the word for the color green/

blue, to reference its fresh and vital nature rather than its actual appearance. There are examples of blue-painted White and Red Crowns in the Ptolemaic and Roman periods,²⁸ and it is possible that the color blue symbolized scarcity, or value. Almost all deities' wigs are painted blue—rather than black, as is more usual in tomb contexts—and are commonly shown with blue or green skin.²⁹ Additionally, at the Dynasty 19 mortuary Temple of Sety I at Abydos, the king is at times shown with a *khat* headdress that is painted yellow rather than the traditional white. It is plausible that this color change was intended to draw attention to the specific temple context and distinguish it from usual depictions.³⁰ These interpretations allow for a complex and nuanced color symbolism throughout Egypt's history. To re-create the color of the Dendur scene, then, it was essential to examine temple painting in Ptolemaic and Roman Egypt afresh to find resources specific to Dendur's time period and context.

COLOR AT DENDUR

The most complete survey of Dendur before the flooding of the Aswan Dam was conducted by Aylward Blackman and published in 1911.³¹ In his notations of remaining paint, Blackman recorded only the polychromy in the interior spaces of the temple proper, especially the front room, or pronaos. The interior walls of the pronaos are completely decorated with relief carving and were extensively painted, as was probably the case with all the relief carving at the temple complex. The ceiling is decorated with a central panel, depicting six vultures with alternating vulture and uraeus heads, which was bordered on either side with columns of elaborately colored patterns.³² The remainder of the ceiling was painted blue with gold stars, which in temple decoration symbolized the night sky above the mound of the first creation.³³ The decoration of the southern, western, and northern walls is organized in two registers, which are bordered by a base of Nile gods processing offerings and a running frieze of alternating vultures and *kheker*-pattern (rows of knotted bunches of reeds or grass) with significant remaining polychromy below the ceiling illustrated by Blackman's letter codes (fig. 3). He described some remaining paint in all scenes in the pronaos, as on the ceiling and the frieze.³⁴ The amount of extant paint recorded by Blackman in the twentieth century indicated that the temple complex was originally vibrantly painted, leading the research team to investigate remaining evidence at Roman-period temples and objects in museum collections to inform the Dendur re-creation.

COMPARISONS WITH OTHER TEMPLES AND MUSEUM OBJECTS

A number of Roman-period temples in Egypt have recently been cleaned, providing valuable data about their original painted surfaces. In the pronaos of the Temple of Hathor at Dendera, the removal of layers of soot and grime accumulated over millennia revealed brilliant polychromy of blue, green, yellow, red, and white pigments, all against a white ground, completely covering areas on column shafts and capitals, walls,

and ceiling (fig. 4). The small Temple of Isis at Deir Shelwit—probably begun in the Augustan period, with construction and decoration continuing into the reign of Domitian (A.D. 81–96)³⁵—was also cleaned and opened by the American Research Center in Egypt by 2014 within the Metropolitan Museum’s concession for the Joint Expedition to Malqata (JEM). Its interior is entirely covered with painted relief scenes. At the Temple of Khnum at Esna, cleaning of the interior of the pronaos, which dates to the reign of Claudius (A.D. 41–54),



fig. 5 Detail of extant paint on Augustan column drum. Roman period, reign of Augustus (27 B.C.–A.D. 14). From Koptos. Sandstone with paint and traces of gold leaf, overall 26 × 21¼ in. (66 × 54 cm). Museum of Fine Arts, Boston, Harvard University—Boston Museum of Fine Arts Expedition (24.1808)

fig. 6 Detail of extant paint in a side chamber at the Temple of Hathor, Dendera, showing the royal kilt with two uraei



fig. 7 Detail of extant paint on the Augustan column drum from Koptos (fig. 5)

fig. 8 Detail of extant paint in a side chamber, Temple of Hathor, Dendera

revealed a painted surface as extensive as that at Dendera. Paint survives on many objects in museum collections, as well. A column drum from Koptos that dates precisely to the Augustan period, now in the Museum of Fine Arts, Boston, was particularly helpful for this study (fig. 5).³⁶ In tandem with Blackman's records of paint at Dendur, surviving evidence from both Roman-period temple contexts and museum objects enabled the team to develop and investigate a number of research topics essential for the digital re-creation. These topics and the team's findings are surveyed below.

General Palette and Coloration of Figures

The color palette specific to the later periods of Egyptian history, as seen at Dendera, includes red, yellow, light blue, darker blue, two greens, black, and white; gold leaf was used to emphasize some areas of yellow, as on the column drum from Koptos. Regarding skin color, Blackman noted that Augustus's skin was painted red and the details of his eye and beard were picked out in white and black in the upper register on the western wall of the interior of the pronaos at Dendur.³⁷ Similarly, on the column drum from Koptos, Augustus's skin is painted the traditional reddish-brown used for male humans throughout Egypt's history. The same skin color is seen at Dendera, in the figure of a pharaoh who wears a short, starched kilt, armlets, and a neck collar (fig. 6). Human skin color was differentiated from that of deities; Blackman noted that Pedesi and Pihor are frequently shown with blue or green skin at Dendera. The god Osiris is painted green on the drum

from Koptos (fig. 7), and two seated deities are also painted with blue skin at Dendera, where blue is indeed the color used most for deities' skin (fig. 8). These examples demonstrate that male deities' skin continued to be painted blue or green in the Augustan period, while male human figures were usually depicted with reddish-brown skin.

Color of Crowns

Blackman noted several instances in which crowns at Dendur were not painted according to the canonical color scheme of earlier periods. In images of Augustus alone, Blackman recorded six cases where the double crown, or the combined crown of Upper Egypt and Lower Egypt (traditionally painted white and red, respectively), had remains of green and yellow paint.³⁸ Noncanonical use of color can also be observed at Deir Shelwit. The newly cleaned reliefs in the interior of the small temple show that Osiris's atef crown is painted yellow with red plumes (fig. 9). The unusual choice of yellow for crowns has been documented with frequency from the reign of Ptolemy I, as discussed above, and this crown is similar to the crown of Upper Egypt in another scene from Deir Shelwit. On the column drum from Koptos, the god Osiris wears an atef crown resembling the one he wears at Deir Shelwit (see fig. 7). Integrating the information for colors of both crowns and figures' skin, the Museum's Digital Department created an initial digital version of the scene at Dendur, in which Horus's double crown of Upper and Lower Egypt is green and yellow, his skin is blue, and Augustus's skin is reddish-brown (fig. 10).





Decoration and Composition of Crowns and Regalia

The extensive patterning of both the polychromy documented in Blackman's records at Dendur and the extant paint at Dendera is consistent with research indicating increasingly complex designs on crowns and garments in Ptolemaic- and Roman-period temple reliefs, including those at the Temple of Isis at Philae.³⁹ For instance, Blackman recorded that Pedesi's kilt was painted with vertical stripes of red and blue at Dendur. Horus's kilt has the same pattern and colors at Dendera (see fig. 8), where patterned garments and headgear are worn by both deities and the pharaoh, whose kilt is painted with intricate designs culminating in two pendant rearing uraei in the center of the apron (see fig. 6).

Painted clothing and crowns at Deir Shelwit also display detailed patterns, as in the figure of Osiris,



fig. 9 Detail of extant paint in the interior of the Temple of Isis, Deir Shelwit, Egypt

fig. 10 Adobe Illustrator image for the projection of recoloration for the Temple of Dendur, October 2013

fig. 11 Detail of extant paint on the Augustan column drum from Koptos (fig. 5)

fig. 12 Cleaning in progress in 2014 of the pronaos of the Temple of Khnum, Esna, Egypt



who wears an overlay with striking diamond motifs on top of a white shroud (see fig. 9). The garment is echoed on the column drum from Koptos, where Osiris is clothed in a red shroud with white crisscrossing diamonds that represent an elaborately colored overlay with accents in green/blue and yellow (see fig. 7). On the opposite side of the drum, Augustus's kilt also shows detailed patterns executed in yellow, red, blue, and green (see fig. 5). Painted patterning on the column drum continues in the vulture dress and headdress worn by the goddess Isis (fig. 11). Her dress is comparable to that of a goddess, probably Hathor, who stands behind the seated god Khnum in a scene at the Temple of Khnum at Esna (fig. 12). In each example, the goddess's close-fitting sheath dress is delicately encircled by wings of alternating swaths of red, blue, green, and white feathers that correspond to the vulture wings of her headdress.





fig. 13 Relief carving on the exterior of the pronaos at Temple of Khnum, Esna

Technical Execution of Patterned Decoration

Comparative evidence was examined to assess whether patterns were always carved into the relief as well as painted, or if they were sometimes executed solely in paint. Both paint and carving were found in a monumental scene at the Temple of Khnum at Esna. There, on the northeastern wall of the exterior of the pronaos, Khnum is represented extending his right arm over a multitude of captives, indicated by their upraised hands (fig. 13). Close examination revealed that Khnum's patterned vest and kilt are visibly articulated in the relief carving and still bear vestiges of remaining paint.

The vest shows remnants of green/blue, red, and yellow paint, and the kilt has remains of yellow paint in the vertical stripes executed in the relief. A similar correlation of pattern and relief carving is evident in an exterior scene at the Temple of Mandulis at Kalabsha, where the goddess Isis's vulture headdress and winged dress are eloquently carved into the western exterior wall.

At the dual Temple of Haroeris (Horus, the Elder) and Sobek at Kom Ombo, however, remaining paint shows that some patterns were represented in paint alone, but others were both painted and carved. In a scene depicting the crocodile god Sobek seated before the falcon god Haroeris, the relief carving of both gods' kilts shows vertical lines of patterned garments, although no remaining paint is visible in either kilt. Paint is visible in the patterns of both gods' thrones; in the case of the chairs and bases of the thrones, patterns are visible as executed in paint only, and not in carved details of the relief (fig. 14).⁴⁰ Analysis of the garments worn by all the figures at Deir Shelwit revealed that their brightly painted and detailed patterns (see fig. 9) are only painted, and not carved. Again, on the column drum from Koptos, Osiris's shroud is executed only in paint.

Material and Color of Painted Ground

The majority of polychromy at later-period temples, including Dendur, appears to have been painted on top of a ground of gesso (white gypsum plaster). The extant evidence at Dendera shows that polychromy was painted over a white ground, similar to that surviving on a Persian-period column capital from the Temple of Amun at Hibis in the Museum's collection.⁴¹ The scenes at Deir Shelwit reveal that the ground is a bright white. Although the paint on the Koptos column drum survives only fragmentarily, a white gesso ground is visible in several small patches around its figures and hieroglyphs (see figs. 5, 7, 11).

Coloration and Condition of Hieroglyphs

Blackman noted that Augustus's epithets were painted in vibrant polychromy, with a blue surrounding cartouche and the individual hieroglyphs in yellow, red, green, blue, and black.⁴² This scheme corresponds to a facsimile in the Museum's collection of a Late Period (ca. 712–332 B.C.) painted relief from the Temple of Amun at Hibis that shows the god Seth slaying a serpent.⁴³ The facsimile was created in 1929 as part of the Museum's Egyptian Expedition by Charles Wilkinson, who documented the temple by painting facsimiles of its reliefs dating to the reign of Darius I (521–486 B.C.).

fig. 14 Detail of relief at the Temple of Haroeris and Sobek, Kom Ombo, Egypt, with patterns that are only painted, not carved



When line drawings through vector images were created in Adobe Illustrator for Dendur's projection, the extent of erosion that weathered away original lines for the hieroglyphs and figures became apparent. In order to re-create details, the team compared line drawings and previously published versions of the hieroglyphs and figures with the actual surface of the temple. Combining all this information, the Digital Department created a final digital rendering (fig. 15).⁴⁴

Summary of Findings

Through research for the digital image, it came to light that the polychromy at Dendur, and other temples that date to the Roman period in Egypt, differed from that of earlier periods in complex ways deserving of serious scholarly attention. The color palette, specific to later periods of Egyptian history, included red, yellow, light blue, darker blue, two greens, black, and white; gold

leaf was used to emphasize some areas of yellow. Color symbolism diverged from that of earlier periods as well. In the pharaonic period, for example, the crowns of Upper and Lower Egypt were white and red, respectively, whereas in the Roman period, they were frequently painted yellow and green (and thus cannot accurately be called the White and Red Crowns in Roman-period contexts). The variety of colors and patterns for crowns was paralleled in the increased complexity of figures' clothing and regalia, which were decorated with intricate patterns that were sometimes painted and sometimes carved as well as painted. Hieroglyphs could also be painted a variety of colors. All of this brilliant polychromy contrasted with a white gesso ground.

Future investigation may shed light on the reasons for placement of colors and use of pigments, whether these relate to changes in meaning and symbolism,



practical concerns, availability of painting materials, or other causes. Further work may also illuminate how pigments change chemically and visually over time, and how certain colors may not appear today as they were intended to be seen in antiquity. More collaborative research like that undertaken for the Dendur project may yield additional detailed information about Roman-period temple painting and how to re-create the lost polychromy of other monuments.

A VIRTUAL RE-CREATION OF DENDUR'S COLOR

Once projected onto the temple's stone, the digital image dramatically evoked the brilliance and luminosity of the ancient painted surface, with its jewel-like colored patterns on a bright white ground and its hieroglyphs in a variety of hues (fig. 16). Projection mapping technology allowed the image to conform precisely to the relief carving of the temple, giving a naturalistic three-dimensional quality.

fig. 15 Adobe Illustrator image for the projection of recoloration for the Temple of Dendur, December 2013

To attain this re-creation, members of the Museum's Digital Department creatively employed digital tools. Working with high-resolution photographs, the team translated the three-dimensional scene into a computer file that could be utilized in multiple software programs by vectorizing the image in Adobe Illustrator. The vectorized lines of the digital drawing were brought into openFrameworks in order to perfect the outline and create the color palette and placement. MadMapper was used to project this optimized and colored digital file onto the temple, so that the file could be edited in real time and manipulated to conform to the precise engraving in the stone.

Building on the success of the polychromatic projection, the team developed a series of animations for the purpose of storytelling. In order to emphasize interaction between figures, an animation that highlighted the dialogue (as carved in hieroglyphs) was created with Adobe After Effects. Additionally, an

animation was designed to explain how three-dimensional figures in Egyptian art were translated onto a two-dimensional surface. Composite profile view is the standard technique for ancient Egyptian drawing, painting, and relief carving, and digital technology has a unique malleability to help demonstrate composite profile view in a vivid three-dimensional way. In one animation, Horus and Hathor were shown side by side in the projected image (as opposed to being in a line with Horus standing in front of Hathor) to emulate how the two-dimensional relief would morph into three-dimensional space.

The project evoked Dendur's lost polychromy as an essential element in ancient art and architecture. The temple was alight with color for selected hours from January to April 2016 in a popular installation called "Color the Temple" that visitors felt brought them closer to the temple's creators.⁴⁵ The projection was again on view in April 2017 as part of the fifty-year celebration of the presidential award of the temple to the Museum.⁴⁶ Through "coloring the temple," new scholarly research on Roman-period temple painting

in Egypt was made accessible through digital technologies, and an icon of the Museum's collection was brought to life.

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fig. 16 Projection of the December 2013 version of the recoloration for the Temple of Dendur

NOTES

- 1 Scholarly interest in ancient polychromy was stimulated by the discovery of the famous statue of Augustus with traces of polychromy at Prima Porta in 1863, and the topic continually resurfaces in modern art historical scholarship. For recent publications, see Tiverios and Tsiaphake 2002; Brinkmann, Wünsche, and Wurnig 2004; Cleland, Stears, and Davies 2004; Brinkmann et al. 2007; and Panzanelli, Schmidt, and Lapatin 2008. For digital resources, see the Ny Carlsberg Glyptotek's Tracking Colour project: <http://www.trackingcolour.com/about>; the University of Georgia's Ancient Polychromy Network: <http://www.ancientpolychromynetwork.com/>; the Digital Archaic Heraion Project at Mon Repos, Corfu: <https://cdrhsites.unl.edu/monrepos/>; a color reconstruction of the Temple of Kalabsha in Sundstedt, Chalmers, and Martinez 2004; the British Museum's Ancient Polychromy Project in Dyer, O'Connell, and Simpson 2014; and the Visual Computing Lab ISTI-CNR's digital reconstruction of Ulpia Domnina's sarcophagus in the Museo Nazionale Romano-Terme di Diocleziano in Rome in Siotto et al. 2015.
- 2 Aufrère 2001, pp. 158–60.
- 3 Le Fur 1994, p. 92. Anna Serotta pointed out that there are also possible practical reasons that gum binder would be utilized, because it improved ease of use with a variety of materials; personal communication, June 28, 2015.
- 4 A demotic graffito dated to 11/10 B.C. was carved in the pronaos, thereby offering a terminus ante quem for the building of Dendur (Griffith 1935–37, vol. 1, Dend. 1).
- 5 Peters 2015, pp. 260–63.
- 6 Serotta 2017.
- 7 Tomb painting is the center of Arpag Mekhitarian's 1954 monograph on Egyptian painting, Francesco Tiradritti's 2008 monograph on Egyptian wall painting, and Tiradritti's 2015 essay on painting in the Wiley-Blackwell handbook on Egyptian art.
- 8 On pigments, see Green 1995, Berry 1999, Lee and Quirke 2000, Green 2001, and Scott 2016. On symbolism, see Kees 1943; Schenkel 1963, pp. 131–36; Aufrère 2001; Pinch 2001; and Baines 2007.
- 9 Green 2001, p. 44.
- 10 Scott 2016, pp. 187–97.
- 11 Arnold 1999, p. 148.
- 12 Baines 2001, p. 148.
- 13 Lorna Green (2001, p. 44) has written on vermilion and red lead. Joanne Dyer, Elisabeth O'Connell, and Antony Simpson (2014, p. 93) have written on green earth.
- 14 Scott 2016, pp. 193, 196.
- 15 Green 2001, p. 43.
- 16 Schenkel 1963, pp. 131–36; Baines 2007, pp. 242, 246–47.
- 17 Pinch 2001, p. 183; Baines 2007, p. 242.
- 18 Baines 2007, pp. 243, 245.
- 19 Pinch 2001, pp. 183–84.
- 20 Baines 2001, p. 145.
- 21 Dieter Arnold (1999, pp. 277–304) most eloquently discusses these forms, including the *wabet*, pronaos, entrance porches and kiosks, birth house, cult terrace, composite column capitals, screen walls, and broken-door lintel.
- 22 Baines 1997, p. 230; Arnold 1999, p. 148; Baines 2007, p. 252; McKenzie 2007, p. 136.
- 23 Kessler 2009, p. 354.
- 24 Ibid.
- 25 Ibid., p. 357.
- 26 I am grateful to Caroline Roberts for drawing my attention to the process in which coated white paint can appear yellow if the coating darkens, or if a yellow coating (like pistacia resin) is intentionally applied.
- 27 Kessler 2009, pp. 359–62.
- 28 Baines 2007, p. 252.
- 29 Baines 2001, p. 149.
- 30 Ibid.
- 31 Blackman 1911.
- 32 Ibid., p. 27, pl. 111, 1.
- 33 Ibid., p. 27, and also noted by Cyril Aldred (1978, p. 37).
- 34 Blackman 1911, pp. 33–36.
- 35 Klotz 2012, p. 321.
- 36 This column drum is one of five Augustan examples at the Museum of Fine Arts, Boston, from Koptos with remaining paint. Henri Gauthier (1911–27, vols. 3 and 4) recorded significant paint remaining at the Augustan Temple at Kalabsha and produced a number of color plates; however, flooding of the temple also removed remnants of paint, as at Dendur.
- 37 Blackman 1911, p. 32.
- 38 Ibid., pp. 31–35.
- 39 Vassilika 1989, pp. 83–124.
- 40 Dyer, O'Connell, and Simpson's study (2014, p. 96) also revealed the presence of patterns in the throne of the three-dimensional Roman-period Horus that were singularly painted and not carved.
- 41 MMA 10.177.2. Michelle Berry (1999, pp. 1–2) also found polychromy over a ground of white gesso at a second-century A.D. shrine in the Dahkla Oasis.
- 42 Blackman 1911, p. 32, pl. 117, fig. 5.
- 43 MMA 48.105.5.
- 44 Aly, Hamid, and Leblanc 1979, pl. 44.
- 45 Barone 2016.
- 46 <https://www.metmuseum.org/about-the-met/curatorial-departments/egyptian-art/temple-of-dendur-50>.

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