Digital Initiatives

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NEW PERSPECTIVES ON RELIGIOUS ART THROUGH THE DIGITAL TWIN: TWO STELAE OF PĀRVATĪ FROM EAST INDIA

Collections in museums commonly provide one's initial encounter with actual works of religious art, not only for general visitors but also for students of Asian art, and these collections often remain a major source for many scholars throughout their careers. This circumstance, together with the availability of museum objects, largely shapes our perceptions of Asian art. Although museums offer an ideal environment for research and the conservation of art, we may easily forget the original goals of art-making. Objects of religious art—in the present context, East Indian sculptures from the Pāla period[1]—were created for worship, not for analysis through the lens of the art historian in a museum, where they appear completely detached from their native cultural environment.

In what follows, two stelae will be showcased and their disparate settings of use and preservation will be compared. The removal of the original architectural and ritual context in both cases, as well as the partial loss of a sense of historical storytelling based on the complicated biography of each object, raises questions of authenticity.[2] This discussion will touch upon a technical solution by means of interactive digital models known as digital twins and address the benefits and limitations of the method.

The Pārvatī in Penance

The invasion of Muslim Ghaznavid armies from the Kabul region into the Gangetic Plain during the last years of the twelfth century left Buddhist monasteries and Brahmanical temples in ruins. While Buddhism vanished, Brahmanism adapted to the new situation. Sculptures were saved from the rubble or unearthed from temples turned into mounds over the centuries and sheltered in village shrines. The village temple as a type of unorthodox sacred space became an agglomeration of religious objects stripped from the original, sophisticated temple architecture. Something new came into being—not in the sense of a new religious tradition but as a new spatial and ritual environment.

The first stele, depicting the goddess Pārvatī, comes from such a background. It is among dozens of salvaged Brahmanical and Buddhist sculptures assembled at the Sūrya Temple at Bargaon, a modern village temple north of Nalanda in the Indian state of Bihar (figs. 1, 2).

Recently, Rob Linrothe has strongly argued for recognition of the village shrine as a source for understanding ritual as an indispensable condition for the functionality of any Brahmanical or Buddhist object.[3] He lets photographs speak for themselves through pictures that show statues decorated, lustrated, touched, and even fed by the community. He offers a clearly written statement, but even more importantly a visual one that stands in opposition to the presentation of objects in museums, where religious art becomes artifact.

The common practice of the art historian is to first identify the iconographical components of the image, from clothing to attributes and hand gestures. The Pārvatī stele is placed inside a niche to the left of the entrance temple. The four-armed goddess is standing on a lotus. Her hairstyle resembles the *jaṭāmukuṭa* (matted hair arranged in layers of braids to form a crown) of her husband Śiva. Their relationship is also testified by the crescent moon, Śiva's emblem, attached to the crest of her hair. A *liṅga*, Śiva's phallic symbol, hovers above while the sun and the moon flank the head of the goddess. Pārvatī's facial expression is calm and the eyes are directed downward. Her right hands hold a rosary and make the gesture of bestowing gifts, and her left hands hold a waterpot and what appears to be a book.[4]

Gourishwar Bhattacharya lists this depiction of Pārvatī as belonging to the bridal type of Devī, also known as the "Tapasvinī Pārvatī" (Pārvatī in penance), which N. P. Joshi discusses in a monograph of the same title.[5] It refers to the penance and hardship that Pārvatī has to go through after misbehaving as the spouse or wife of Śiva, that is, acting against the rules set for a wife within the Brahmanic society. In the image under discussion, the goddess is flanked by her sons: Karttikeya to her proper right and Gaṇeśa to the left. Karttikeya is portrayed with his animal mount (*vāhana*), the peacock, between his legs, and four more *vāhanas* are shown along the front of the pedestal. The central field beneath the lotus seat is occupied by Pārvatī's *vāhana*, the *godhā* lizard (fig. 3).[6] The field to the viewer's left shows the bull (Śiva's mount) following two kneeling donors. In the opposite field the lion (Pārvatī's secondary mount) faces the onlooker, while at the far end the mouse (Gaṇeśa's mount) is placed vertically and faces its master. Despite their accurate discussions overall, both Linrothe and Bhattacharya mention only four of the *vāhanas*. Linrothe omits the central lizard; Bhattacharya specifically mentions the absence of the mouse.[7]

In iconographical studies, however, components external to the art objects—ephemeral and temporary additions or even the depiction of human behaviors—are usually considered peripheral and often omitted in visual analysis. In this case, the goddess is treated with various kinds of *pūjā* (ceremonial rites). The most obvious is the decoration with flowers and the application of color to the auspicious parts of Pārvatī's body and the emblems. According to Stella Kramrisch, the practice of touching and applying marks (*nyāsa*) is accompanied by the recitation of the root mantra of the deity and "[by] thus touching it ritually, it is felt alive with the breath of the cosmos."[8] Since actual feeding is impossible, rice is placed above the goddess's forehead on the band of the tiara. Another notable ceremonial act is the pouring of milk over the deity (*payas snāna*) (fig. 4).[9]

Pūjā is a crucial part of the religious tradition. The original ceremonies around the Pārvatī stele are impossible to reconstruct due to the erasure of the original spatial settings.[10] More exacerbating perhaps is the complete loss of such ritual, or rather the contrast to the living
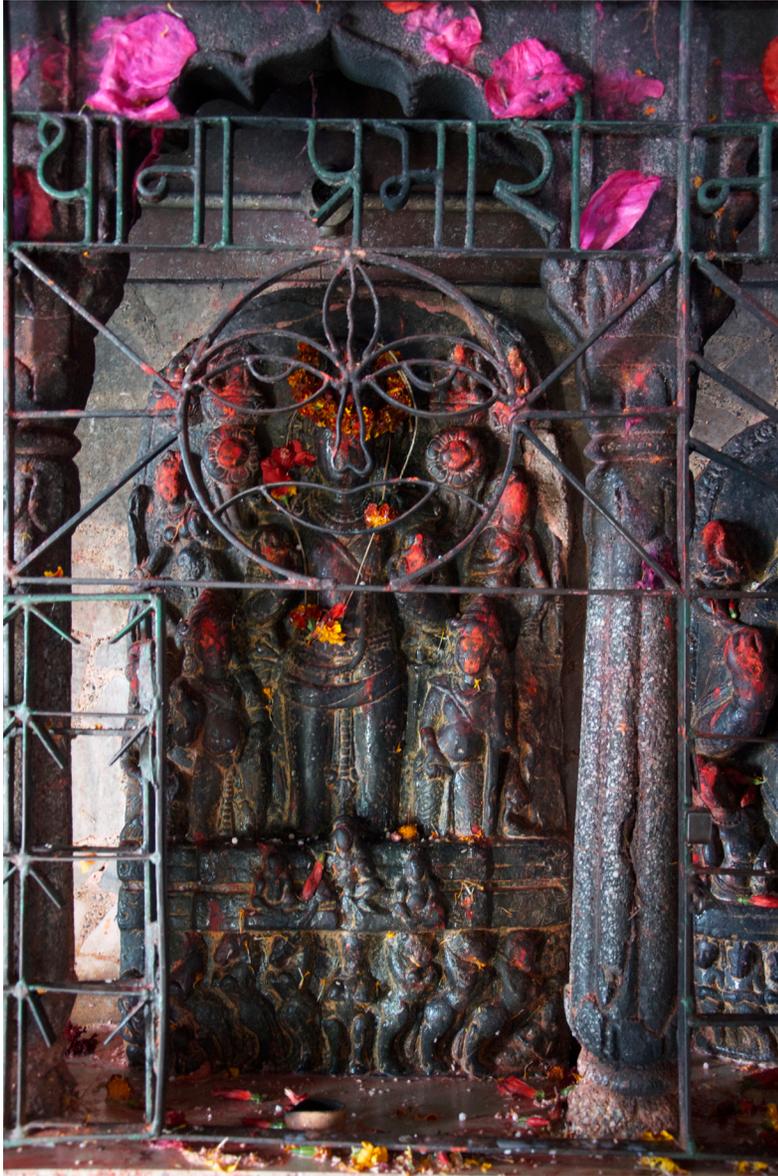
FIGURE 1. Sanctum of the 20th-century Sūrya Temple at Bargaon enshrining sculptures from the Pāla period (ca. 8th–12th century). Photo by Gerald Kozicz, 2013

tradition, of a religious object in a museum. This is demonstrated by a second stele, a similar Pārvatī statue on display at the Asian Art Museum of San Francisco (fig. 5). Only two of the four hands of the badly damaged goddess are partly preserved. The positions of the two sons are reversed and placed in front of banana trees. Above the leaves, the remains of an archi- tectural *prabhā* frame are discernible to the viewer's right.[11] Karttikeya holds a *vajrā* (diamond scepter) instead of his spear. The *godhā* is depicted on the pedestal below his feet, while the central field is occupied by two lotus flowers. Behind the *godhā* is a gooselike bird grabbing something in its beak. As in the Bargaon Pārvatī, two donors are depicted on the opposite side with a bull behind them. The overall design no doubt shares the same iconographical compo- sition as the Bargaon Pārvatī. But how far does the comparison of iconography lead us to a full picture of the meanings and significance of the stelae?

FIGURE 2. Pārvatī stele (schist or phyllite) at the Sūrya Temple gate, Bargaon. Photo by Gerald Kozicz, 2013

The Digital Twin

Modern standards for the conservation or exhibition of museum objects is not the focus here, but the obvious loss not only of the spiritual quality but also the ritual context of religious art in museums cannot be ignored. There is no way to revive the kind of ritual that would require physical contact with the idol in the perfectly controlled environment of a museum gallery. Modern technologies, however, allow the re-creation of at least the visual information of the lost ritual, not in the sense of materiality but instead virtually, through the digital twin. Photogrammetric documentation in situ makes possible the reconstruction of both the object and the context of the original location. The digital twin captures a specific moment in the life of a sculpture and creates an authentic replica. Its advantage is interactivity on a visual level: The opportunity to examine the object on the screen or in a simulated,
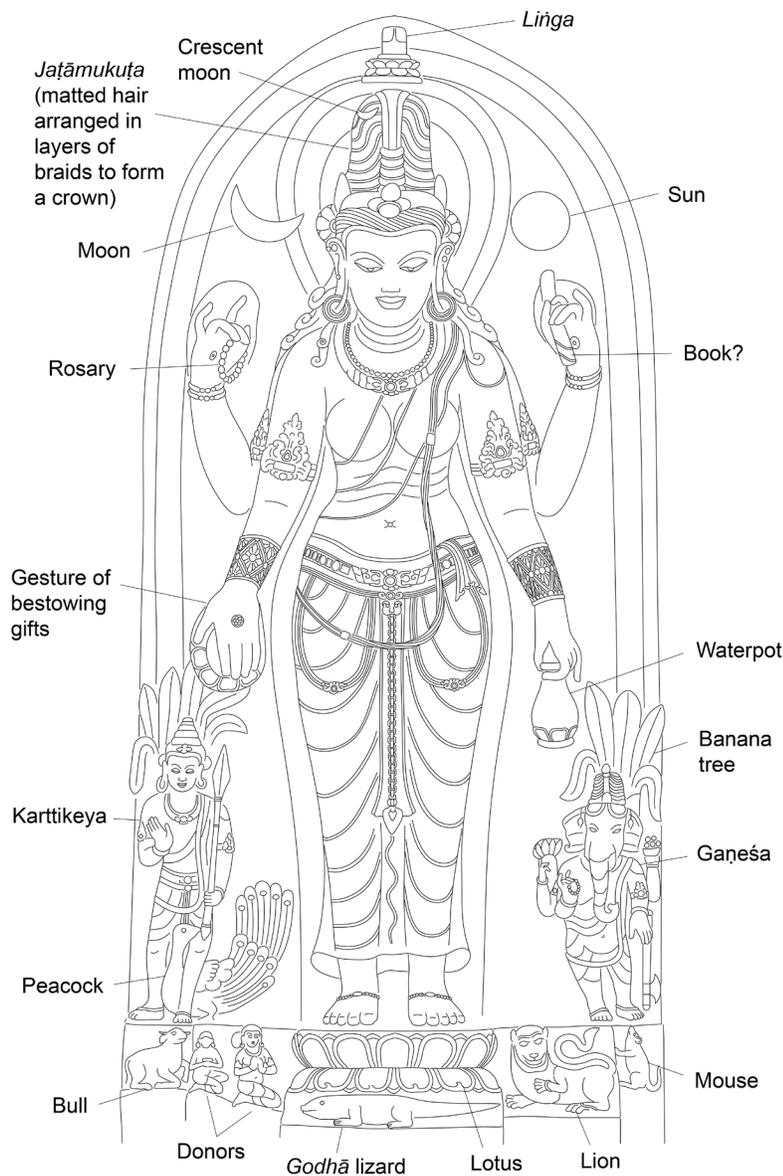
Labels on the line drawing:
- *Liṅga*
- Crescent moon
- *Jaṭāmukuṭa* (matted hair arranged in layers of braids to form a crown)
- Moon
- Sun
- Rosary
- Book?
- Gesture of bestowing gifts
- Waterpot
- Banana tree
- Karttikeya
- Gaṇeśa
- Peacock
- Mouse
- Bull
- Donors
- *Godhā* lizard
- Lotus
- Lion

FIGURE 3. The Bargaon Pārvatī stele. Line drawing by Gerald Kozicz, annotation by Di Luo

immersive environment is a way of inspection completely different from scrolling through photographic archives (figs. 6, 7). Furthermore, in comparative studies, 3D models allow the choice of the same viewing angle or frame depending on the specific detail under examination (figs. 8, 9).

Our specific example from the field illustrates another advantage of photogrammetric documentation. The model was generated from a set of digital photographs: The success of the modeling process depended on the complete coverage of the stele. A three-dimensional shape can only be created through triangulation and the identification of common points from overlapping photographs, that is, every single point of the surface has to be captured at least three times. This approach to taking photographs is neutral toward the iconographic value of specific parts of the object.[12] Thus, it is less likely that certain components or parts of a sculpture
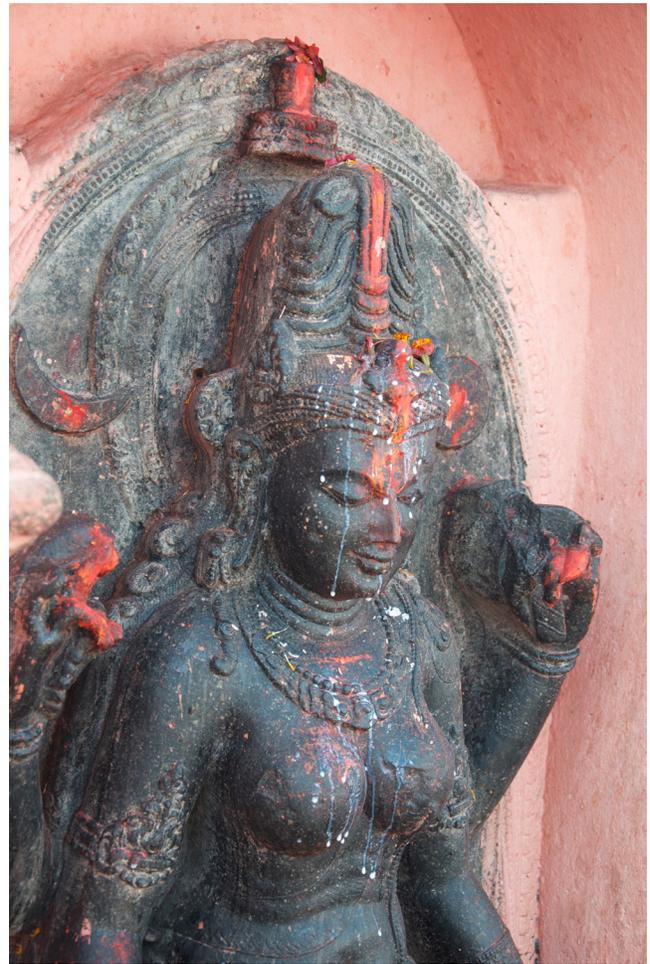
FIGURE 4. Traces of fresh milk and rice on the Bargaon stele. Photo by Gerald Kozicz, 2013

will escape the researcher's attention, as has been the case with previous scholarship on the Bargaon Pārvatī wherein two of the *vāhanas* escaped notice.

The 3D model presented here shows the stele of Bargaon Pārvatī under veneration. It is decorated with flowers and red paste, bathed with milk, and "nourished" with rice. Despite the faithful capture of the state of worship, the virtual image presents the results of the ritual but not the ritual itself.

In the Hindu pantheon, Pārvatī is the foremost representation of Devī, the essence of female divinity. But beyond the identification of the sculpture as her "penance," there is a constellation of elements that hint at a more specific narrative background. While the sun and the moon refer to time and space in a cosmic context, the *liṅga* hints at a crucial post-marriage episode in the life of Pārvatī and Śiva. According to the *Skanda Purāṇa*, as translated by N. P. Joshi:

> [I]n [the] course of conjugal activities Pārvatī once closed all [three] eyes of Śiva with her hands, of course unmindful of the consequences. But because of this act, all of [a] sudden the working of the sun, the moon, and the fire, the three deities of Śiva's eyes, came to a standstill. Every corner of the world became dark, and it appeared that the end of the universe was drawing nigh. The three worlds became highly disturbed and there arose a turmoil. All the gods, being afraid of this

FIGURE 5. Tapasvinī Pārvatī, ca. 1000–1100, Eastern Bangladesh. Basalt, 61 x 40.6 x 17.1 cm. Asian Art Museum of San Francisco, B64S6. Photo by Gerald Kozicz, 2024

unforeseen and untimely calamity, rushed to Śiva for shelter. Now Pārvatī, realizing what she had done, removed her hands. Śiva's eyes were now open and with this everything became normal. Śiva took this simple act as gross misconduct on [the] part of Pārvatī, because instead of being an ordinary young wife, Pārvatī had [by] then become the better half of the Lord of the Universe. In other words, she herself had become the Mother of the Universe (*Jaganmātā*) responsible for [the] welfare of everybody.[13]

This episode provides the source for understanding the image at Bargaon in greater detail. The sun, the moon, and the *liṅga* represent the three eyes of Śiva, and their placement on the halo bespeaks the role of Pārvatī as the one who controls them: Devī as "the Mother of the Universe."

While religious icons are usually made to last forever, they must withstand regular use and worship. They weather and change in physicality during their lifetime. For "living statues" such as the Bargaon Pārvatī, concerns are raised about the decay of the stele caused by physical contact and the application of substances in the course of daily ceremonies. It is true that damage does occasionally occur. In a photograph from more than one hundred years ago, the figure does not show significant traces of washing or coloring, but the nose of the goddess

is broken.[14] In the photograph taken by Gerd Mevissen in 2011, the nose is still damaged (fig. 10). The series of photographs taken in 2013 from which the 3D model was generated, however, show the nose intact. No scholar has previously taken notice of the repair even though the face of the goddess has since been admired by many for its exceptional state of preservation. Does the modern nose preserve the divine power felt from the statue, or does it compromise its artistic originality and religious authenticity? Conservators, art historians, and temple visitors would likely arrive at very different answers. Conservators are naturally very careful and reluctant regarding such substantial repairs, and if undertaken at all, they are well documented. Would any museologist have even considered such a "perfect" repair of the nose? For the local community at Bargaon, however, restoring the face was more than an aesthetic undertaking. It revived the dignity of the goddess, who is considered a living entity. One might assume that such restoration work would continue if the stele sustained any future damage. Preservation and restoration across time can be digitized through photogrammetry and help us to record not only changes to the conditions of the sculpture but also to record the related rituals, that is, the interaction between community and sacred object.

Conclusion

The digital twin not only offers new perspectives on academic subjects; it also opens the door to the virtual space and an immersive experience through interactivity. The technology allows us to transfer objects virtually to a museum or any other space. It thereby contributes to discussions about the digital preservation of cultural heritage and the safeguarding of cultural identity.

Stephen Whiteman recently made a strong point about the Western dominance of the digitization of art objects, noting that, "by making elite and metropolitan collections even

FIGURES 6 AND 7. Orthographic renderings of the frontals of the Bargaon Pārvatī (https://skfb.ly/pAIqO) and the San Francisco Pārvatī (https://skfb.ly/pAIqQ). Photogrammetric models by Di Luo
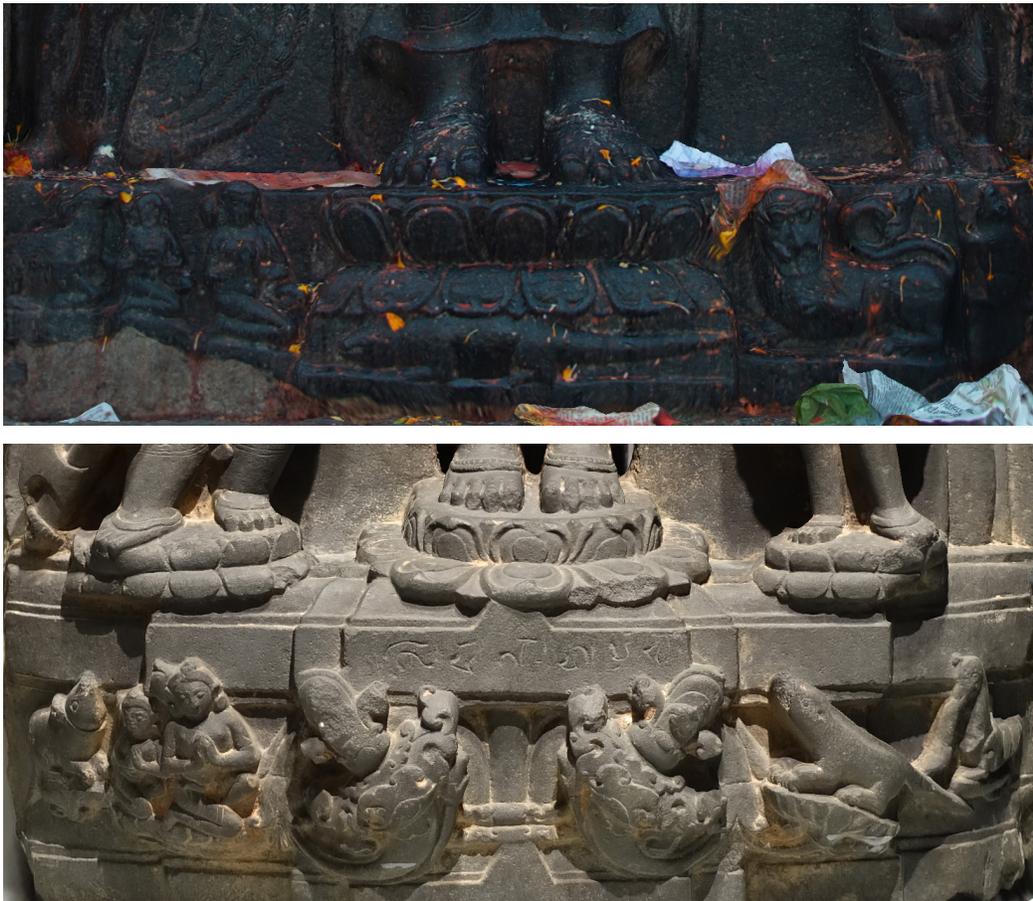
FIGURES 8 AND 9. Comparison of the details of the two stele pedestals from the same viewing angle. Photogrammetric models by Di Luo

more accessible than they were before, digitization has, to a significant extent, reinforced the hierarchies of a 'global' art world defined by Euro-American institutions and networks, rather than destabilizing or undermining them."[15] We can hardly disagree with such an assessment of the current situation, which displays the dominance of Western museum collections among the accessible online resources.[16] But the situation is a result of how available technologies have so far been applied. The models of the two Pārvatī steles not only showcase the advantages of 3D presentation but also advocate for the next step, that is, the application of Virtual and Mixed Reality technology. Such immersive experience reaches beyond the potential of databases and videos alike. The digital twin—in our case the Bargaon Pārvatī—holds the potential to virtually extend the museum space toward the complementary "living traditions," making accessible a religious object's ritual and cultural context without intrusions into the original sacred spaces.

Whiteman's statement serves as a reminder that the discussion—despite the attempt to foreground the perspective of a village community in East India—remains the output of secular academic training. Perhaps the best way to overcome such intellectual restrictions would be to adapt the concept behind Linrothe's monograph, that is, to let the images and models speak for themselves.
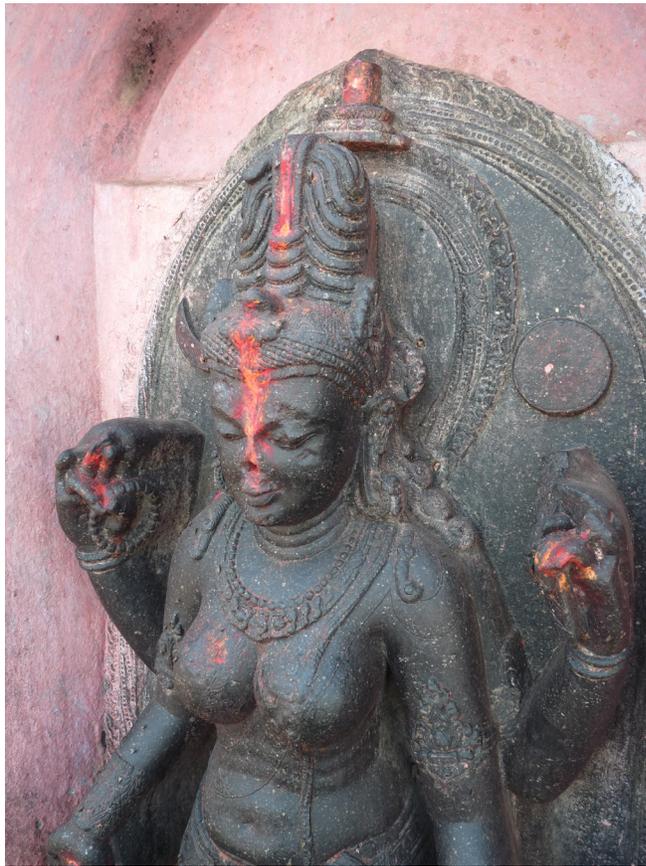
FIGURE 10. The Bargaon stele's broken nose, 2011. Photo by Gerd Mevissen

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Notes

1 We use the term *Pāla* in an art historical context to define East Indian art between the eighth and the early thirteenth centuries.

2 This has been a focal topic in recent studies of the digital cultural heritage. See, for instance, Bernadette Flynn, "The Morphology of Space in Virtual Heritage," in *Theorizing Digital Cultural Heritage: A Critical Discourse,* ed. Fiona Cameron and Sarah Kenderdine, 349–68 (Cambridge, MA: MIT Press, 2007).

3 Rob Linrothe, *Reenchantment: Masterworks of Sculpture in Village Temples of Bihar and Orissa* (New Delhi: Studio Orientalia, 2021). The author takes a critical stance toward the dominance of rationalism within modern scholarship, which deprives the art of its spiritual qualities in a process of analytic screening.

4 Linrothe, *Reenchantment*, 22.

5 Gourishwar Bhattacharya, "A Special Type of Devi Figure from Bihar and Bengal," in *Facets of Indian Art*, ed. Robert Shelton et al., symposium proceedings, V&A Museum, April 26–June 1, 1982 (London: V&A Museum, 1986), 36–37; N. P. Joshi, *Tapasvinī Pārvatī: Iconographic Study of Pārvatī in Penance* (New Delhi: New Age International, 1996).

6 Elora Tribedy, "From Tribal to Sacred: The Changing Gaze on Godhā (Indian Monitor Lizard) in Antiquity," *Berliner Indologische Studien* 26 (November 2023): 29–60.

7 Bhattacharya, "A Special Type of Devi Figure," 36.

8 Stella Kramrisch, *The Hindu Temple* (University of Calcutta, vol. 2, 1946; repr., Delhi: Motilal Banarsidass, 2007), 305.

9 We thank Elora Tribedy (email correspondence, April 9, 2025) for her explanations of the ceremonies.

10 Museums have tried to reconstruct these rituals in limited ways or call attention to them. The National Museum of Asian Art organized a small exhibition entitled *Puja: Expressions of Hindu Devotion*, March 1996–July 2000, that focused on the objects used in *pūjā*.

11 A *prabhā* frame is composed of animals and mythic creatures with an elephant at the bottom, followed by a lion and/or a *vyāla* (a horned lion-griffin or lion-elephant).

12 For a description of the workflow of photogrammetry-based 3D modeling, see, for example, Chamba Architecture and Art Digital Archive, accessed August 22, 2025, https://iam.tugraz.at/research/chamba/blog/workflow/.

13 Joshi, *Tapasvinī Pārvatī*, 6–7 [Skanda., Māheśvara, Aruṇācala, *pūrvārdha*, 3.23–3.53, pp. 566–69; 4.9–4.10] (translation slightly modified). Joshi also briefly mentions the Bargaon stele and even notes the sun and the moon (p. 15), but fails to draw a possible connection to the *liṅga*.

14 Linrothe, *Reenchantment*, 224. A photograph dated 1970 is accessible at the Huntington Archive, accessed July 15, 2025, https://dsal.uchicago.edu/cgi-bin/huntington/show_detail.py?ObjectID=5606.

15 Steven H. Whiteman, "Toward an Ethics of Place: Asian Art in/and Digital Art History," *Ars Orientalis* 53 (2023), https://doi.org/10.3998/ars.4988.

16 The gap between digital data generated from museum collections and data based on field research significantly increased during the COVID pandemic, which brought fieldwork almost to a standstill.