



KIVA

Journal of Southwestern Anthropology and History

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/ykiv20>

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To cite this article: Kelsey E. Hanson (2023): Color and Chaco Performance: Spatial Histories of Blue-Green Paint Production at Pueblo Bonito, KIVA, DOI: [10.1080/00231940.2023.2204044](https://doi.org/10.1080/00231940.2023.2204044)

To link to this article: <https://doi.org/10.1080/00231940.2023.2204044>



Published online: 08 May 2023.



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Color and Chaco Performance: Spatial Histories of Blue–Green Paint Production at Pueblo Bonito

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ABSTRACT Vibrant and colorful plaza-based performances are one of the key hallmarks of the Pueblo ceremonial calendar, providing goodwill and communicating community histories, traditions, and knowledge. While the archaeological record may be silent on many details of these performances, a focus on the materiality of performance preparations is possible. In this paper, I rely upon the reanalysis of legacy collections from Pueblo Bonito to consider the production of blue-green paint, a symbolically significant color that is ubiquitous on the most emblematic forms of media used in Pueblo performances. I identify several possible paint production locales and ritual storerooms based on the spatial distributions of blue–green pigment, paint production tools, and painted media recovered from Pueblo Bonito. By considering these preparatory spaces in relation to specific construction sequences, I offer spatial histories of performance to suggest that through time, Pueblo Bonito was incrementally modified to sustain increasingly formalized performances.

KEYWORDS Pueblo Bonito, Chaco Canyon, Paint production, Performance, Spatial histories, Pigment, Blue–green, Architecture

Despite fundamental cultural and linguistic differences between communities in the Pueblo World, participation in a complex calendar of ritual performances is one of the few elements that is shared throughout the Pueblos (Ortiz 1994:304). Several different dances are performed throughout the year, providing communities with joy, goodwill, and cosmological balance. Rich ethnohistoric accounts speak of dramatic performances oscillating between public and private spaces, often beginning with long periods of private activities in rooms such as kivas, followed by lively public dances in plazas for large audiences who watch from rooftops and plaza edges (Bourke 1884; Hough 1900; Triadan 2006). These performances are a true feast for the senses:

Through crowds of spectators, the visitor sees masses of rhythmically moving bodies arrayed in colorful costumes and paraphernalia. Excited children run through the village, their laughter mingling with the voices of singers and the repetitive sounds of bells, rattles, and drums. ... Together, the careful ritual preparations, the group movement sequences, the closely interrelated dance and music, the costumes, and the audience itself create a performance that communicates important images and messages to performer and observer alike (Sweet 2004:15).

In addition to the undeniable beauty and aesthetics of these performances, layers of symbolic meaning are embedded in the songs, dances, and colorful regalia, together creating a rich sensory corpus of Pueblo histories, traditions, and knowledge (Ortiz 1972). The requisite knowledge behind these beautiful performances is immense, and their proper execution reinforces the authority of religious leaders through public displays of ritual knowledge (Tedlock 1983). Color is one of the most deeply important and pervasive components that ties together many elements of cosmology and belief. Performances serve as vibrant ecosystems of symbolic and sociopolitical relations communicated and displayed through color.

Regalia worn in performances serves as a particularly vibrant way of communicating Pueblo stories and histories (Bunzel 1932; Roediger 1941). Of all the elements used to construct this regalia, paint is considered one of the most important. Painting is sometimes referred to as an act of “chromatic prayer” (Stephen 1898:265) or “making sacred” (Odegard and Hays-Gilpin 2002:307) whereby paint is *the* substance that imparts animacy in religious media (Bunzel 1932:858; Parsons 1939:341). The symbolic power of paint is deepened by the belief that color can affect events, derived from a key ceremonial principle of “like causing like” (Munson and Hays-Gilpin 2020:15; Parsons 1939:168). Blue-green paints, for example, are often produced and applied as chromatic prayers for fertility and the growth of plants (Munson and Hays-Gilpin 2020:325). The appropriate use of certain colors in specific contexts can evoke an affectual ecosystem of nuanced chromatic relations.

Paint in these contexts becomes a tangible expression of Pueblo cosmologies, evoking powerful and pervasive symbolism rooted in direction, political affiliation, and natural phenomena (Parsons 1939:99). While performers may construct most of their regalia at home, painting is often reserved for initiated religious society members and takes place in private where the paint is prepared following strict protocol (Parsons 1939:319). The mastery of this affectual ecosystem through color – its procurement, manipulation, and display – encodes and demonstrates crucial ritual knowledge. Because the knowledge encoded in these materials is not equally distributed throughout the community, the preparation and ultimate display of these objects is ultimately a performance of ritual knowledge. This knowledge is made visible to large audiences through performances, and through the religious media accompanying these performances (Hays-Gilpin and Hill 1999).

The archaeological record demonstrates that rich traditions of color use have deep roots. For example, traditions of red ochre use are at least 13,000 years old in North America, as shown by its routine use in burials and caches, on the

bones of butchered animals (e.g. Roper 1992), and by evidence for large-scale quarrying (MacDonald et al. 2020; Stafford et al. 2003). Recent scholarship draws from archaeological and ethnographic sources to explore diachronic trends in color traditions in the Ancestral Pueblo world (Munson and Hays-Gilpin 2020) and the material histories associated with the colorful Flower World ideologies of the Greater Southwest and Mesoamerica (Mathiowetz and Turner 2021).

While the overwhelming ubiquity of black and white in Chaco's characteristic pottery traditions suggests a somewhat limited repertoire of color compared to the characteristic polychromy of later Pueblo IV period traditions of murals and pottery, many scholars have worked to demonstrate the rich world of color throughout the Chaco World (Lewis 2002; Mattson 2022; Mattson and Jones 2020; Plog 2003). Museum collections from Chaco great houses and small house communities are brimming with evidence of their chromatic pasts, pointing to rich traditions of ritual and performance.

In this paper, I rely upon the re-analysis of museum collections to illustrate the Chacoan legacy of paint production and its relationship with performances at Chaco great houses. To do so, I focus on production pathways of blue-green paint, a symbolically-loaded color that is nearly ubiquitous on emblematic forms of Chaco material culture related to ritual performance. Of all paint colors in the Pueblo palette, blue-green is one of the most valuable for its symbolic and spiritual significance and associations with life-giving moisture (Hedquist 2017) and its difficulty to obtain and effectively process (Odegaard and Hays-Gilpin 2002:326). Following linguistic terminology used among the Pueblos (e.g. White 1943), I use *blue-green* as a single conceptual category. Dissolving the terminological boundary between *blue* and *green* is both important and appropriate because most minerals used to make blue-green paint (e.g. azurite, malachite, chrysocolla, and others) have such similar chemical formulas that they often co-occur and can replace each other over time. By focusing on spatial distributions related to the production and application of blue-green paint and the storage and discard of blue-green painted media throughout Chaco's complicated construction history, I offer spatial histories of performance at the center of the Chaco World.

Color and Performance in the Chaco World

Characterized by a vast regional system of shared architecture throughout much of the northern U.S. Southwest, the Chaco World was a rich, multicultural hub of convergent identities and emergent power structures. Studies of architecture (Lekson 1984; Neitzel 2003, Neitzel and Lekson 2007), exceptional deposits and dedicatory caches (Bernardini and Schachner 2022; Bishop and Fladd 2018; Heitman 2015; Mattson 2022; Mills 2008), and richly decorated burials (Akins 2003; Plog and Heitman 2010) all point to Chaco Canyon as a ritual center of the Ancestral Pueblo World. Chaco Canyon's great houses were likely major focal points of performance, attracting participants and spectators from far and wide (Crown 2018; Van Dyke 2007, 2019). Indeed, according to many Pueblo oral histories, Chaco Canyon is widely understood as a "center place," a place of convergence for

many different clans before they continued on their separate migration journeys (Kuwanwiswma 2004:44–45; Outah et al. 2021; Seowtewa et al. 2021; Swentzell 2004:51). Chacoan architecture was designed to be visually prominent (Dungan et al. 2018; Van Dyke 2007), and certain architectural features appear to be placed in locations to amplify the sounds of songs and recitations (Witt and Primeau 2019). Plazas and great kivas were likely settings for performances and could have accommodated great numbers of participants and observers (Bellorado 2020; Dungan and Peebles 2018; Triadan 2006).

As the largest and most centralized Chaco great house, Pueblo Bonito appears to have been the epicenter of Chaco's regional system (Neitzel 2003). While many scholars have rightly pointed out that Pueblo Bonito cannot be isolated and treated as a model for the entirety of the Chaco World (see Plog 2018), others see Pueblo Bonito as a justifiable and perhaps unavoidable focal point because of its size and complexity, its long occupational history, exceptional deposits, and robust museum collections due to a long history of excavations (Bernardini and Schachner 2022; Toll 1991:85–86).

Performance and Painted Media

The centripetal force of Pueblo Bonito brought many diverse people together in history, likely through large gatherings with performances and public displays. Historic and contemporary Pueblo performances involve a rich corpus of elements including body paint, cotton clothing, arm bands, headdresses, and a variety of accessories such as jewelry, rattles, and wands (Roediger 1941; Sweet 2004; Vivian et al. 1978:37–58).

Carved and Painted Wood

Some of the most explicit examples of Chacoan painted media related to performance are assemblages of carved and painted wood (Vivian et al. 1978:19–36). Carved slats, boards, and tablitas are often interpreted as components of altars or parts of regalia worn in performances, like tablitas (Jolie and Webster 2015; Vivian et al. 1978:37–53). The most iconic assemblage of over 200 pieces of carved and painted wood is from Chetro Ketl, which is famous for its spectacular zoomorphic forms, represented by birds, possible serpents, plumes, feathers, as well as plaques, slats, and discs (Vivian et al. 1978). Comparable, but smaller assemblages have been documented from other Chaco great houses such as Aztec West (Webster 2011), Pueblo Bonito (Judd 1954:275–276; Pepper 1920:101, 159; Webster 2011:Figure 2(a)), Pueblo del Arroyo (Judd 1959), and Kin Kletso (Vivian and Mathews 1965), as well as Bc 50 (Tseh So), a small house community (Brand et al. 1937).

While Chetro Ketl is famous for its zoomorphic forms, Pueblo Bonito boasts several pieces of carved and painted wood, and some notable examples of painted media with elaborate polychrome designs painted on wood boards, pieces of bark, and gourd rattle fragments. The most elaborate examples include interlocking designs that may be intended to mimic designs seen in textiles (Gruner 2019:156). The impressive technical skill exhibited in the vibrancy

of color and refined linework points to a rich tradition of highly skillful polychrome design and execution, similar to that seen in clay-coated painted basketry.

Carved sticks of various sizes and shapes are found in a variety of forms, including small prayer sticks or *pahos* and large ceremonial staves featuring a variety of carved ends, attachments, and surface treatments. Many of these appear to be elaborations of Basketmaker forms (Jolie and Webster 2015:112), and were likely important symbols of ritual authority (Jolie and Webster 2015:112; Mills 2004). The most famous examples come from Room 32 in the northern burial cluster, where over 300 large, carved ceremonial staves were recovered from the northwest corner of the room (Pepper 1920:140–143), seven of which were painted. While many of these examples of carved and painted wood have become emblematic of Chaco material culture, these objects have important precedents in the Mogollon region and Mesoamerica (Gruner 2015; Jolie and Webster 2015:118–119; Webster 2007:284) and likely signal extensive knowledge networks through time and space.

Clay-Coated and Painted Basketry

Finally, clay-coated painted basketry is a unique elaboration of basketry technology whereby coiled baskets are covered with a coating of red or pink clay and then painted (Jolie 2018:287). The designs on painted baskets are extremely elaborate and required great skill to control the application of multiple colors in intricate patterns (Odegaard and Hays-Gilpin 2002). Pueblo Bonito boasts the earliest examples of this technology (Jolie and Webster 2015:112–113), and later examples are seen in high status burials and ritual contexts in the Flagstaff area and Mogollon regions (Gruner 2015; Odegaard and Hays-Gilpin 2002).

Unlike the carved and painted wood, there are no known ethnographic parallels for this technology (Odegaard and Hays-Gilpin 2002:322). While the exact functions of these types of painted media are unclear, many have argued that their uniqueness, rarity, high visibility colors and designs, and their depositional contexts all point to their use in Chacoan rituals (Bellorado 2020:206; Jolie 2018:288). Bellorado (2020:209) specifically calls attention to the high visibility of these vibrant designs, which would have made them particularly effective for communicating visual messages to large audiences in performances.

Producing Blue-Green Pigments and Paints?

Creating the striking colors for these remarkable objects requires a highly specialized set of skills. Producing paint requires the skillful combination of three basic ingredients: a colorant, a binding medium, and a liquid vehicle. This process begins by first combining ground pigment particles with an adhesive binding medium or binder which is suspended in a liquid vehicle, forming a dispersion. As the liquid vehicle evaporates, the binder holds the pigment particles in place (Odegaard and Hays-Gilpin 2002:323). While seemingly simple, creating a good paint with this basic formula requires a great deal of skill and intimate knowledge

of geologic sources, processing techniques, and substrate-specific application techniques (Munson and Hays-Gilpin 2020:44; Odegard and Hays-Gilpin 2002). Minerals for making paints are not equally distributed in the landscape, and some are quite rare. Pueblo Bonito has more documented pigments than any other excavated Chaco great house, or indeed any single site in the Greater Southwest. This may be due, in part, to the extent to which Pueblo Bonito was excavated compared to other Chaco sites, but it provides a worthwhile context to study paint production. This has been noted by previous scholars (Lewis 2002:75–78; Munson 2020:Table 2.2), but my own research in the museum collections is expanding these counts of Pueblo Bonito pigments significantly.

However, it is important to recognize that not all minerals are used as pigments. Minerals can have many different intended uses: as a colorant to decorate various types of media such as pottery, body paint, textiles, walls (i.e. plaster finishes, murals, pictographs). Some minerals are carved for use as beads, pendants, and mosaic tesserae (Mattson 2016). And some minerals, such as red ochres, are widely used as sunscreen (Judd 1954:115; Rifkin et al. 2015), for hide tanning and as insect repellent (Rifkin 2015), as medicine (Velo 1984), and for lapidary work (Mattson and Jones 2020:422). Because of this diversity of potential uses, the presence of minerals in archaeological contexts cannot be interpreted as unequivocal evidence for any specific use without more information.

Other pigments, however, have a more limited range of possible uses. For example, blue–green colorants such as copper minerals suffer from irreversible blackening when heated, rendering them useless for producing blue–green on low-fired pottery without the addition of a lead flux as in glaze-painted ceramics (Duwe and Neff 2007:404; Plog 2003:672; Rice 1987:337–338). Focusing on the production histories of blue–green paint helps to avoid conflating production histories for different types of painted media, namely pottery.

Despite limitations in producing blue–green in low-fired pottery, it appears that Chacoan pottery still relied upon a visual language meant to symbolize blue–green in materials that could not be used to express the color itself. Based on comparisons of motifs found on pottery and those found on non-fired painted media, such as painted wood, stone, and basketry, hachure appears to be employed in pottery designs as a symbolic referent for blue–green (Plog 2003). It seems that the exceptional examples of polychrome painted media represent an ideal version of this visual language of color, albeit a rare and fragile form of material culture. Because of the fragility and rarity of these exceptional examples of painted media, as well as the specific processing requirements of blue–green paint, researchers have called attention to the importance of specifically looking at material evidence for the production of blue–green paint (Lewis 2002; Plog 2003).

Processing blue–green minerals into workable pigments simultaneously requires great skill, knowledge, and judgment (Odegard and Hays-Gilpin 2002). Creating the right color with blue–green pigments requires careful attention, for the quality of the resulting paint is highly dependent on the fineness of the ground pigments (Rapp 2009:202). If the pigments are ground too fine, the colors can become too pale to use. In some cases, the recipes used are quite intricate and laborious.

Stephen (1898:263, 1936:1192–1194) observed the process for making a copper carbonate-based green, which involved a long and complicated process of melting and kneading a mixture of pinyon gum, water, and copper carbonate to produce a glossy, almost plastic-like paint cake. Also, blue-green pigments are almost always copper-based, which produce a toxic dust when ground that is dangerous if inhaled or ingested. Making paint with such powerful materials – both physically and spiritually – is no casual act.

Tools related to paint production and application are treated similarly and are often stored in the workshops or rooms where they are used. At San Felipe, for example, the manos and metates used for preparing ceremonial paint “constitute[d] a kind of altar” in the rooms where preparations for ritual dances took place (White 1932:29). Especially powerful objects require special storage to protect uninited community members. Specialized ritual storerooms serve as houses for powerful objects whose “spirits and powers were dangerous and unpredictable” and serve as important means of protecting the community (Saile 1977:77).

Archaeological examples of ritual storerooms have been identified on the basis of large quantities of ritually significant objects and specialized storage features such as room-wide shelving for ritual objects. Such rooms act as “places for communication with the spirit world through their placement and connection with the above and the below of the Pueblo universe” (Crown 2020:179). These ritual storerooms carried great significance and some may have been open for hundreds of years to allow periodic access to their contents for ceremonies, or to periodically deposit retired ceremonial equipment. While many are familiar with the ritual storerooms encountered by George H. Pepper in the northern portion of Pueblo Bonito, I suggest that rooms used to produce and store paint and painted media likely had similar functions.

However, because Chaco great houses were often the result of many construction episodes over the course of several generations, the architectural footprint observed today only represents the results of the most recent construction activity. Identifying and understanding ritual storerooms then, requires careful attention to these types of rooms in relation to their architectural contexts and chronologies through time.

A Brief Overview of Pueblo Bonito Construction

Although most Chaco great houses have exceptionally complex construction histories, Pueblo Bonito is arguably the most dramatic example of this and was likely a “never-ending project of construction, remodeling, renewal, and destruction” (Crown and Wills 2018:890). Pueblo Bonito’s initial construction began in the mid-A.D. 800s, but its iconic D-shape floor plan was not introduced until much later. Detailed analyses of masonry styles, tree-ring dates, archaeomagnetic dates, and ceramic data reveal several discrete construction episodes (Figure 1; Lekson 1984:109–144, 2007; Windes and Ford 1996).

The earliest construction of Pueblo Bonito was not completed at once but was the result of several decades of constructing room suites beginning in the A.D. 850s which eventually formed an arc of approximately 100 ground floor

rooms, varying from one to four stories in height (Figure 1(a); Crown and Wills 2018:897). This early arc of rooms contains two crypts for high status individuals, spatially clustered into northern and western burial clusters, who were accompanied by the richest assemblages of funerary objects ever recovered in the Greater Southwest (Akins 2003; Plog and Heitman 2010). Often referred to as the foundational arc, or “Old Bonito,” these original rooms were used for several hundred years after its initial construction. Beginning in A.D. 1040, building efforts sequentially added more rooms, expanding the size of the foundational arc of rooms, adding and modifying formal plaza space, and introducing and periodically decommissioning great kivas, court kivas, and blocked-in kivas (Lekson 2007).

Building efforts referred to as Stage III by Lekson (1984:134–135) substantially modified Pueblo Bonito’s layout to create a clearly bounded plaza space (Figure 1 (b)). This involved the addition of two rectangular room blocks of two-story rooms appended to either side of the original northern arc of rooms, each connected by a row of double walls demarcating a D-shaped plaza (Lekson 1984:134). A series of three elevated kivas were built in front of each room block, the roofs of which formed a terrace in front of each room block, facing a newly constructed great kiva in the West Court (Lekson 1984:134; Stein et al. 2003:49). Additional building efforts at Pueblo Bonito continued to increase its overall size (Figure 1 (c)), and bisect the plaza with a long north–south row of rooms dividing Pueblo Bonito into eastern and western halves (Figure 1(d)).

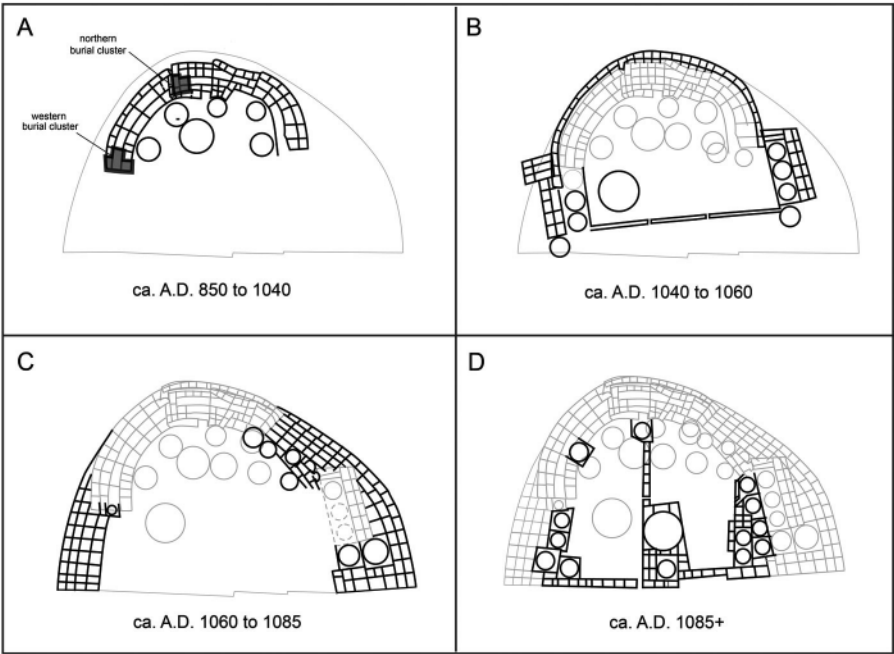


FIGURE 1. Summary of construction sequences at Pueblo Bonito, after Lekson (1984).

Spatial Distributions of Blue–Green in Pueblo Bonito

Distributions of blue–green painted media, blue–green pigment, and tools bearing traces of blue–green paint or pigment are based on catalog descriptions and field notes available from the Chaco Research Archive (chacoarchive.org) and from the American Museum of Natural History, Smithsonian National Museum of Natural History, National Museum of the American Indian, and the Chaco Culture National Historical Park. Terminology used in catalog descriptions to describe paints, pigments, and their substrates varies greatly, hindering the wholesale reliance on catalog descriptions for analysis (Munson 2020:26). For example, terms like pigment, paint, and dye are often mistakenly used interchangeably, and mineral designations often rely upon color alone, rather than confirmation through analysis. Based on my preliminary documentation of these museum collections, objects described as “paint” are often incorrect, but usually indicate some form of processing. Making a paint involves the intentional combination of a pigment, binder, and liquid vehicle, but most objects described in museum collections as “paint” are often curated or processed pigments with no evidence for the addition of a binder. I include modified and unmodified minerals such as azurite, malachite, and chrysocolla as a single category of blue–green pigment. I omit any blue–green minerals that are not effectively used as paints. Turquoise, for example, is a widely used blue–green mineral, but one that does not make a workable blue–green paint. Counts and distributions presented here rely on a combination of catalog descriptions, museum analysis, and field notes, because some pigments were described, but not necessarily retained by each repository.

Blue–Green Painted Media

Over the course of Pueblo Bonito’s complicated history of construction and use, an interesting pattern emerges in the intra-site depositional trends of painted media, namely painted baskets, carved and painted wood, and painted ceremonial staves and *pahos* (Figure 2(a)). The most exceptional and elaborate examples of Pueblo Bonito’s painted media are found in the foundational arc of rooms of Old Bonito. These elaborate expressions of polychromy reflect deep knowledge of paint application and the requisite accompanying ritual knowledge to accomplish it (Lewis 2002; Odegard and Hays-Gilpin 2002). These objects are especially concentrated in caches associated with the burials of two elite founding families of Pueblo Bonito, or in back rooms of room suites.

Painted basketry has exclusively been recovered from rooms in “Old Bonito,” most of which are from the two high status burial clusters. As the oldest known examples of this painted basketry technology, the pattern seen at Pueblo Bonito initiates a trend seen throughout the Greater Southwest in which painted basketry is found in ritual contexts or accompanies high status burials (Gruner 2015; Odegard and Hays-Gilpin 2002). The earliest burials in these clusters date to the late ninth century (Heitman and Plog 2010), but the subsequent burial of matrilineally-related individuals demonstrate continued use for several centuries (Kennett et al. 2017). Over time, a total of six painted baskets were deposited in rooms in the western burial cluster, and one in the northern burial cluster (Jolie 2018:Table 7.5).

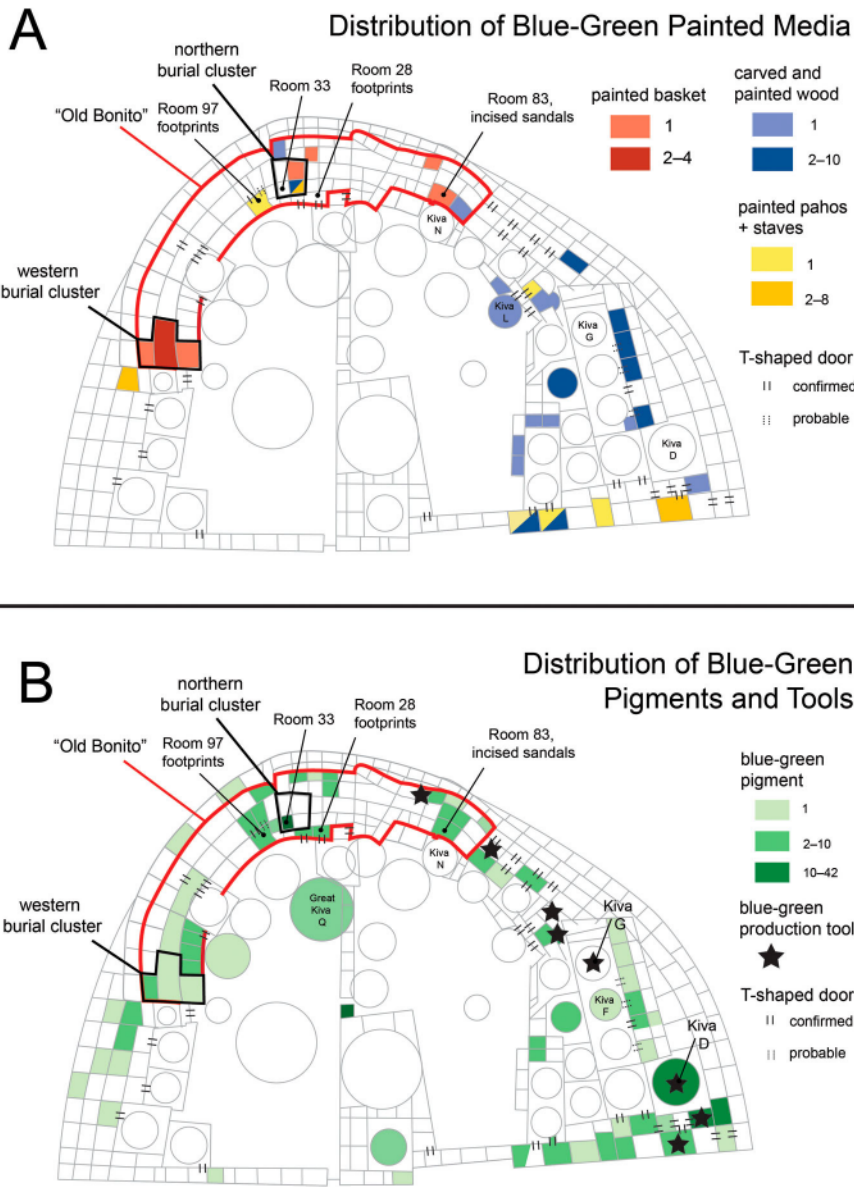


FIGURE 2. (A) Distributions of blue-green painted media at Pueblo Bonito. (B) Distributions of blue-green pigment and blue-green paint production tools at Pueblo Bonito.

In addition to well-known examples of painted media, other forms such as carved wood, gourd rattles, and buckskin point to a more expansive material repertoire related to performances at Pueblo Bonito. Most of these are found in the eastern half of the building in rooms constructed in the mid-eleventh century (Jolie and Webster 2015:118; Judd 1954:276).

It also appears that carved and painted wood deposited at Pueblo Bonito was quite old and was in use for many decades. For example, radiocarbon dates from a fragment of green-painted wood from the west bench recess of Kiva L yielded dates firmly placing it in the Early Bonito phase (A.D. 850–1040) (Ditto 2017:277). Because Kiva L was built much later than this (Figures 1(c) and 2(a)), in the Classic Bonito period (A.D. 1020–1100), this suggests that the regalia were likely heirloom pieces in circulation for many years before finally being retired. Their absence from mortuary contexts suggests that they are not objects that belong to individuals, but are rather examples of inalienable objects which are community-owned and circulate through corporate groups such as house societies or sodalities (Gruner 2018; Mills 2004).

Painted ceremonial staves and *pahos* are the only types of painted media which crosscut these contexts. While they are found in abundance in the Room 33 of the northern burial cluster as part of the well-known cache of carved wooden staves, notable examples are found in back rooms located behind Kiva L and in rooms adjacent to kivas in the southeast corner of Pueblo Bonito.

However, because of the rarity and fragility of these objects, it is difficult to know if these patterns are truly robust. It is possible, for example, that these patterns say more about differential excavation techniques between George H. Pepper and Neil M. Judd. Further, the distribution maps presented throughout this paper are based on artifact counts. However, because many of these objects are quite fragmentary, it is possible that several fragments may be from a relatively small number of objects. For example, while the rooms in the Stage III room block yield high counts of painted wood, my recent documentation of these objects reveals that the large numbers of fragments (e.g. 39 fragments from Room 262) are all pieces from about four objects. It is also possible that these types of objects were not necessarily deposited in architectural space, but may have been deposited elsewhere in distant shrines or caves (Nicolay 2009; Webster 2007). This is why it is important to turn to other lines of evidence to understand the spatial histories of Chacoan performance.

Blue–Green Pigment and Paint Production Tools

Not only are blue–green pigments found in great abundance at Pueblo Bonito (Lewis 2002:75–78), but these pigments are often restricted to media used in ritual contexts and performances. Because of the ubiquity of blue–green on emblematic forms of Chacoan material culture and because of its specific processing requirements outlined above, I argue that understanding the production pathways of blue–green paint offers a compelling and complementary lens into the organization and production of performances in the absence of other more rare and perishable materials.

Distributions presented in Figure 2(b) demonstrate that blue–green pigments are found throughout Pueblo Bonito, though they are often concentrated in kivas or in rooms adjacent to kivas. Exceptional amounts are found in two locations: Room 33 and in and around Kiva D. Room 33 is the burial location of 14 high status individuals who were accompanied by more than 30,000 objects, most of which were beads and pendants made of turquoise, jet, and shell (Plog and Heitman

2010:19622). In addition to this, there is a high concentration of blue-green pigments in the southeast corner of Pueblo Bonito, especially in and around Kiva D, spaces that were constructed in the latter half of the eleventh century (see Figure 1(c)).

Blue-green pigments are distributed broadly throughout Pueblo Bonito, but tools demonstrably related to their production are comparatively rare. Some have described the tools used to process pigments and paints as expedient (Judd 1954:285), pointing to the use of recycled door slabs and jar covers for processing pigments as evidence of expediency compared to more specialized tools seen among historic Pueblo communities (Judd 1954:285). However, my own preliminary analyses have demonstrated that this expediency is most often only seen in objects used to produce red, and in some cases yellow. This likely speaks to the diversity of uses for red ochres, as discussed earlier. In contrast, producing blue-green is a far more specialized act.

The general paucity of evidence for tools for preparing blue-green paints may be partially explained by an inclination not to waste precious materials. Because grinding blue-green pigments is time consuming and laborious, it is likely that great effort was taken to ensure that no processed pigment and prepared paint was wasted. In general, tools bearing traces of blue-green paint are found in the eastern half of Pueblo Bonito. The limited distribution of paint production tools in inaccessible rooms suggests that the requisite knowledge to produce and apply blue-green paint was not shared widely, but was quite restricted.

The skillful production of blue-green paint at Pueblo Bonito is exceptionally well-illustrated by a green paint cake from Kiva F (see Figures 2 and 3), located in the room block associated with Lekson's Stage III construction phase (1984:134, see Figure 1(b)). Prepared paint cakes are rare examples of an important stage in paint production in which processed pigment is combined with an organic

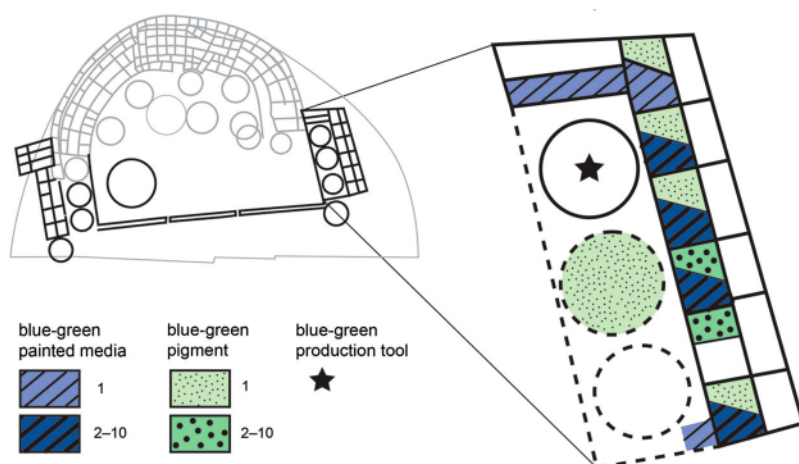


FIGURE 3. Distributions of blue-green painted media, pigment, and production tools in the surviving Stage III room block at Pueblo Bonito.

binder to produce a paint which is then dried and stored for later use. This remarkable example of a green paint cake bears impressions of the corn husks in which it was wrapped for storage. This further underscores the importance of this suite of rooms for the highly skilled production of colorful materials for Chacoan ceremonialism.

Tools used to process, store, and apply blue-green pigments and paints are highly specialized, most often highly-polished and sometimes decorated mortars for producing highly refined pigment powders and small, tri-lobed ceramic bowls which are used for storing prepared paints during application (Pepper 1920:66; Roediger 1941:99). Only one blue-green production tool, a tri-lobed ceramic bowl with blue-green pigment residues, was recovered from a room in the northern arc of rooms. All other tools are found in kivas or in rooms adjacent to kivas in the eastern half of Pueblo Bonito. However, examples of such tools are rare. This apparent rarity could be, in part, because of the significance of the pigments which may have necessitated more thorough cleaning to ensure that none was wasted. It is also possible that these faint, and often microscopic, traces were missed by the original excavators.

Combined, concentrations of blue-green pigment and tools used to process blue-green pigment into paint point to specialized areas dedicated to paint production. While the public portions of a performance primarily take place in plazas, they are often preceded by long periods of isolation in private kivas for prayer and the preparation of necessary regalia. Historically, such preparatory spaces often take on great significance. At the conclusion of such performances, the regalia and ritual equipment requires special treatment and storage in designated ritual store-rooms because of the ritual power that they hold (see Mills 2004). Tools related to paint production and application are treated similarly and are often stored in the workshops or rooms where they are used.

These paint production locales often feature elite sandal imagery or symbolically-charged architectural features. Room 28 and Room 97 exhibit impressions of six-toed footprints, and Room 83 in the cluster of rooms behind Kiva N was plastered and decorated with incised jog-toe sandal images (see Figure 2(a,b); Crown et al. 2016:432). Given the frequency of polydactyly among Chaco's founding members sandal imagery with an emphasized sixth toe is routinely interpreted as a sign of elite power expressed in sandals, murals, ornaments, petroglyphs, and effigies (Bellorado 2020; Crown et al. 2016; Marden 2011). Access to these rooms is often made via T-shaped doorways (Figure 2(a,b)) – symbolically significant, yet enigmatic architectural features that remain hotly debated (Lekson 1984:134, 2015; Lister 1978).

T-shaped doorways are well known throughout the U.S. Southwest and Mesoamerica at Chaco great houses, and sites like Paquimé, Chichén Itzá, and Palenque and in many late Classic Maya sites (Love 1974; Taube 2001). Their placement often demarcates prominent boundaries between public and private space (Lekson 1984:28), though sometimes they were inverted or highly stylized and symbolic (Callis 2021:6–8). Marc Callis (2021) suggests that the T-shape may be a representation of the Mayan glyph *Ik'*, which represents wind, breath, and by extension, life, or spirit. The *Ik'* glyph is often depicted in simplified form as a

“T” shape, either upright or inverted, in altar scenes depicting the invocation of rain, where key rain-related deities emerge from *Ik*’-shaped spaces (Coltman 2014:43–44). T-shaped doors have also been documented in historic Pueblos, and individuals from Acoma and Jemez have explained that the T-shape is an important element of rainmaking rites throughout the Southwest (Mindeleff 1989:190–193). For some representatives from Hopi, the T-shaped door is also said to represent the face of Maa’saw the guardian of the Fourth World, the original place of the first people, who eventually emerged into this world (Outah et al. 2021).

T-shaped doors provide access to important spaces in Chacoan sites, like the iconic entrances into Casa Rinconada, and continue to be important architectural features throughout the Greater Southwest. Within Pueblo Bonito, a pair of T-shaped doors in the ritual storeroom Room 28 provided access between the plaza and the northern burial cluster (Crown 2020). These rooms may have provided important access to the burials of Pueblo Bonito’s founding families, perhaps facilitating the deposition of commemorative or dedicatory offerings. Given the symbolic referents that are likely encoded in the use of T-shaped doors, the deposition of such offerings may have been a key component of ceremonial practices related to power and rain-making efforts.

One of the most interesting additional examples of T-shaped doorways and performances is in the surviving room block associated with Stage III construction (Figure 3). As discussed earlier, doors from these new plaza-facing rooms opened onto the roofs of three elevated kivas located in front of the rooms. Second story doors opening onto the roofs of the kivas only survive partially in two instances, but those that survive are T-shaped (Lekson 1984:134). Because T-shaped doors are often found in plaza-facing rooms (or rooms that were originally plaza-facing) in Chaco great houses, they were likely important for elements of ceremonial processions, perhaps related to rainmaking performances like their Mesoamerican counterparts.

Rooms in the surviving eastern Stage III room block contain unusually high numbers of blue–green pigment, production tools, and blue–green carved and painted wood, painted buckskin fragments, and painted gourd fragments. A large and highly specialized pigment mortar in Kiva G of the Stage III room block, suggests that this portion of Pueblo Bonito was dedicated to processing suitable minerals into workable pigment powders. Because tools – especially large tools – are often left in the workrooms where they are used, Kiva G is a strong candidate for a paint production workroom. Combined, these fragmentary objects all point to the remnants of material used in performances.

The relationship between Stage III construction and performance is further substantiated by the presence of one of two aviaries used to house live scarlet macaws (Judd 1954:107, 264; Lekson 1984:135), the feathers of which are common elements of performance regalia among the Tewa (Parsons 1939:592), Zuni (Ladd 1963:95–96), Hopi (Stephen 1936:463–464), and Kersean-speaking groups (Tyler 1991:13–14). Their presence marks clear ties to their native homelands hundreds of miles to the south in the tropical forests of Mesoamerica (Schwartz et al. 2022).

Interestingly, the Stage III room block is the only Pueblo Bonito room block that also provided sustained access to exterior space (Lekson 1984:135). These access points were later obscured by construction in the late 1000s (Figure 1(c)), but in use, would have provided relatively easy “backstage” access to the interior plaza. The construction of this room block was coeval with the introduction of road-related infrastructure (Windes 2003:22) in an area which Wills and colleagues (2021:101322) suggest likely facilitated processions between Chetro Ketl and Pueblo Bonito. This suggests that this Stage III construction articulated with a broader Chaco ritual landscape, perhaps directing movement in and out of the great house through a wider network of ceremonial processions and performance.

Towards Spatial Histories of Chacoan Performance

At their height, Chaco great houses were no doubt vibrant places to witness. While much attention is given to the final resting places of some of the more elaborate components of Chacoan polychrome material culture, I argue that expanding our scope beyond these assemblages associated with burials allows for a more robust and nuanced perspective on the development of performances in the Chaco World. Although some of the most elaborate examples of Chacoan painted media are in burial contexts in Old Bonito, a variety of other rooms were also used to house painted media and the tools used to prepare blue–green paint. Producing blue–green in paint is a skillful and symbolically powerful act that was carried out in specific locales within Pueblo Bonito, especially in spaces that articulated with plaza space in symbolically-loaded ways.

Looking beyond the burials of Old Bonito to explore preparatory spaces elsewhere, it appears that paint production and application took place in ceremonial spaces throughout Pueblo Bonito, especially those that articulated between public and private space using dramatic and symbolically-charged architectural boundaries, namely T-shaped doorways. Based on analogous examples in Mesoamerica and in the historic Pueblos, the Chaco examples may have been intended to invoke symbolic relationships as part of ceremonial processions related to emergence and rain-making (Crown and Wills 2018:900).

This article builds upon growing recognition of the role of performance in the development of the Chaco World (Crown 2018; Heitman 2015; Van Dyke 2007; Weiner 2015; Witt and Primeau 2019), which was managed and orchestrated by groups of ritual leaders whose ritual knowledge was carefully controlled through “nested layers of access” (Van Dyke 2007:121). The strong prevalence of highly elaborate painted media (e.g. painted basketry) with burial contexts and the presence of painted ceremonial staves and elite imagery throughout these spaces underscore the likelihood of elite involvement and perhaps sponsorship of such events. The frequent use of rooms adjacent to kivas as preparatory space may also be evidence for the emergence of several corporate religious societies (Heitman 2015), a trend that seems to have increased in conjunction with major remodeling events.

The perspective offered here articulates with the proliferation of more landscape-scale interpretations (e.g. Van Dyke and Heitman 2022) to consider

how such performances were organized at the intra-site level. I build upon these studies by examining architectural change alongside depositional trends in paint production to demonstrate that Pueblo Bonito underwent a highly controlled period of reorganization and revitalization which corresponds with a period of expansion throughout the Chaco World to include many more outlying communities and great houses. At this time, the advent of more formalized plaza-based performances and the rich bodies of knowledge that were shared in these events may have drawn outlying communities to the center of the San Juan Basin. The spatial distributions of paint production described here presents Pueblo Bonito as a ceremonially vibrant place, where chromatic knowledge was likely shared and celebrated widely. Considering these developments through time offers eventful histories of incremental pulses of architectural investment in performance and public gatherings. It appears that as Pueblo Bonito grew, a prime motivator for these pulses of architectural expansion was a desire to accommodate large gatherings of people with structured displays of ritual knowledge.

Although the events that took place at Pueblo Bonito have long passed, the archaeological record captures material histories of these past events where ritual knowledge was shared and celebrated through carefully orchestrated displays of chromatic metaphor. Such displays of ritual knowledge – through song, dance, and colorful regalia – likely reinforced the authority of ritual leaders responsible for their production, transforming Pueblo Bonito into a true ceremonial center of the Greater Southwest.

Acknowledgements

I would like to thank Barbara J. Mills, Lindsay M. Montgomery, Nancy Odegaard, Samantha G. Fladd, Hannah V. Mattson, Ruth Van Dyke, Kellam Throgmorton, Octavius Seowtewa, Melonie Ancheta, and Heidi Gustafson for providing feedback for this paper at various stages of its development. Thank you to the many researchers and staff at the American Museum of Natural History, the National Museum of Natural History, the National Museum of the American Indian, the Chaco Culture National Historical Park, the Maxwell Museum of Anthropology, and the Chaco Research Archive who graciously provided access to data, museum records and collections that were central this research. Finally, I want to thank the Arizona Archaeological and Historical Society for selecting this paper for the 2022 Hayden Prize.

Disclosure Statement

No potential conflict of interest was reported by the author.

Funding

This work was supported by a collection study grant from the American Museum of Natural History: a constance M. Filling Fellowship at the National Museum of Natural History; National Science Foundation: [Grant Number 2129710].

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