Chapter 1

MATERIAL COLOR, LANGUAGE, AND KHRÔMA

An artist painted the scene of a painter and a workshop assistant adding colors to a statue of Herakles on the outer surface of a large terracotta bowl used for mixing wine and water. Found in Apulia (in southern Italy) in the fourth century BCE, the scene included an image of the living Herakles approaching the painter and his assistant in the middle of painting his statue. (Figures 15 and 16). In the scene, the statue stands on a plinth and the painter works on the statue’s body in situ, while his assistant warms several implements on a brazier for applying pigments blended with beeswax known as the encaustic technique. This depiction is regularly cited as evidence that ancient Greek sculptures were painted.

1 Terracotta column-krater, Metropolitan Museum of Art, New York, 50.11.
Figure 15  Artist and assistant painting a statue of Herakles as the demigod Herakles approaches, obverse of terracotta column-krater (bowl for mixing wine and water), attributed to the Group of Boston 00.348, ca. 360–350 BCE, fired terracotta with added pigments, H. 20 1/4 in. (51.5 cm). The Metropolitan Museum of Art, New York, 50.11.4
Artists crafted scenes of artistic production, such as bronze casting, stoneworking, weaving, potting, and painting, on ceramic vessels and votive plaques. These were also carved onto jewelry or appear on statuettes. Although not strictly documentary, these depictions offer glimpses of practices not often preserved in archaeological and textual records.\(^4\)

The Herakles scene would be produced either by a sole artist or a group of artists working together to make and paint the mixing vessel. Images would then be painted onto its surface with clay, slips, and additional pigments added after firing.\(^5\) All the materials used in assembling the mixing vessel and painting the Herakles scene, have their own colors. A painter of ceramics collaborating with a potter, or


a single artist performing both roles, built up this image of the painter and his assistant painting a statue on an object which had its own use history. In this way, the imagery offers some insight into the artistic practices and collaboration involved in painting a statue, while the choice of an artist to paint a statue on a fired ceramic vessel focuses our attention on the transmedial complexities of material color. The Herakles mixing vessel foregrounds a distinction within the broader category of material colors (khrôma) between assemblage (i.e. fitted together color-parts) and additive color (i.e. material colors on a surface).

Additive color, especially the material colors added to the surface of a marble sculpture, is a subset of colors that has been most contested in the reception of ancient Mediterranean art. Marble sculpture has been the priority medium and material, drawing more attention and analysis than other artistic media. At least in (2019), http://asapjournal.com/asli-cavusoglu-theplace-of-stone-jennifer-stager the public antiquarian debates in the eighteenth and nineteenth centuries CE white marble has also been the primary surface and site on which battles over ancient Mediterranean color have been fought. Despite the range of colors of marbles and an art and archaeological record replete with objects and surfaces produced in many other materials, including limestone, terracotta, wood, bronze, gold, and ivory, the question of paint on marble has been the primary focus of debate and research. This narrowly framed debate, however, substitutes the presence or absence of paint on marble for the presence or absence of all color in the ancient Mediterranean, in different artistic media, in texts, and of bodies. Expanding to include other materials, this chapter concentrates on the broad category of material color (khrôma) and the distinction within material color between additive color and assemblage evident on the Herakles mixing vessel. Foregrounding color’s materiality allows the recovery of an associated language of materials across different textual genres that names and describes colors, maps their connections, and traces the part-to-whole relationships that material colors build up.

Material colors bear a deep connection to the earth from which they are sourced. While modern synthetic color production allows for additional colors as well as those provided by the earth, contemporary artists continue to work with earth-born artists and assemblage evident on the Herakles mixing vessel. Foregrounding color’s materiality allows the recovery of an associated language of materials across different textual genres that names and describes colors, maps their connections, and traces the part-to-whole relationships that material colors build up.

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7 See, for example, Kremer pigments, which stocks a vast range of historical, earthborn pigments and chemically produced pigments. On the rise of synthetic pigment production in nineteenth-century France, see Laura Kalba, Color in the Age of Impressionism: Commerce, Technology, Art (University Park, Pennsylvania: Pennsylvania State University Press, 2017).

seven visible colors (red, orange, yellow, green, blue, indigo, violet), disconnected color from the earth and from matter. Newton’s prism experiments produced an argument that colors are produced by our perception of light and their existence is perceived by the mind. Newton’s construction of a spectrum of seven colors to align with the seven notes of the musical scale necessitated his division of blue and indigo a fancy that belies the scientism of the seven-color spectrum. Nonetheless, his interpretations of his experiments have dominated modern explanations for the phenomenon of color. Ancient Greek writers also wrestled with questions of color and optics, perhaps shaped by the many colors used by artists and the vivid polychromy of the natural world, and they approached the phenomenon of color as primarily material. This ancient understanding of color’s materiality inflected and was inflected by artistic practices, philosophical engagement, and a language of materials.

These divergent approaches to color—one modern and perceptual, the other ancient and material—have contributed to difficulty in tracing color in the ancient Mediterranean. In addition to the problems caused by these vastly different understandings of the phenomenon of color, academic divisions between philology and material culture have diminished our ability to see material colors in both texts and objects of the ancient Mediterranean. Those mining texts for color-words rarely explored art and archaeological records. Even epigraphy has been studied historically as words isolated from their archaeological contexts and separated from the objects on which they were written. Excavating color-terms in conjunction with the many colors preserved in the art and archaeological record makes visible a language of material color that accords with the material colors of art and architecture. In the ancient Mediterranean, colors were understood in material terms and thus registered volume, depth, and space in ways that modern understandings of color do not account for. Scholars searching texts for hue-words often overlooked ancient Greek material colors because they disregarded words that marked the relationship between materials (stones, metals, flowers, soils) and their colors. Attention to this language of color indicates places where we do not expect color or where a word names a material, and we need to understand and picture its color. Seeing colors on and in objects invites us to recognize more color-words in texts, recognizing a robust period language. This chapter explores this language of material color so that we can understand more thoroughly not only what objects might thus be understood in color-terms, but also the visual and cultural resonances that colors held for viewers.

MATERIAL COLOR

Ancient Mediterranean color (khroma) was understood to comprise hues (khromata), variegation (poikilia), and brilliance (lamprotēs).


I am translating khrōma as “material color” to distinguish this earlier conception from the post-Newtonian understanding of color as dematerialized hues. Distinguishing color (singular khrōma) from hues (plural khrömata) also marks the difference between the umbrella term khrōma, which captures the material, spatial, and kinetic components of material color, and one of its components (plural khrömata), hues.

To develop a fuller understanding of ancient Mediterranean concepts of color, we need to look at a broader range of terms and across a range of genres, where we find material color conveyed by a nexus of words that connote not only hues but also sheen, affect, and animation. Rather than a language of hues, the language of color in ancient Greek is the language of materiality. Ancient artists produced objects in different media from Greek is the language of materiality. Ancient language of hues, the language of color in ancient Greek between material color and skin, the largest organ in the human body, retains the idea of an integrated system or assemblage of connected parts. In this sense, just as khrōs connects the surface layers to the interior parts and systems of the body, so do material colors on the surface of an object connect to its interior color-parts and systems.

Through its relationship to skin (khrōs), color (khrōma) integrates surfaces and depths. And yet, over time color (khrōma) seems to lose some sense of this integrated materiality of surface (khrōs). The etymology of the English word


13 See Katerina Ierodiakonou, “Philosophy and Science,” in A Cultural History of Color in Antiquity, ed. David Wharton (London: Bloomsbury, 2021), 2–3; Empedocles B71, B96, which both use the words “fitting together.”


15 Chantraine, Dictionnaire étymologique, 1233.

16 The Latin word color might not retain the same dimensional and spatial sense. Both Rachael Goldman and Mark Bradley
“color” from the Latin celare (to hide), occulere (to cover), and clam (secretly) perpetuates the idea that surface color might deceive and also emphasizes the notion of surface as a separate rather than an integrated part of the whole form or assemblage. This detachment eventually converges with the modern dematerialization of color. After Newton, the English word “color” refers most typically to dematerialized hues rather than retaining the material, spatial, and bodily dimensions of color that were active in the ancient Greek language and ancient Mediterranean artistic practices.

Over time, this dematerialization of color impacts its status. As color grows less materially solid than its underlying form, it is eventually understood as less than its underlying form. Writing in the seventeenth century, John Locke distinguished between primary, or true, qualities of the body, such as shape or movement, and secondary, or subjective, qualities of the body such as the sensory perception of colors, sounds, and smells to reinforce a hierarchy with shape and form (morphē and eidos) at the top and color (khrōma) below. Locke argues that these secondary characteristics are dependent on the empirically true primary characteristics.

For example, he addresses the light-dependence of color perception in Idea 19:

Let us consider the red and white colours of porphyry: hinder light but from striking on it, and its colours vanish; it no longer produces any such ideas in us. Upon the return of the light, it produces these appearances on us again. Can anyone think any real alterations are made in the porphyry by the presence or absence of light, and that those ideas of whiteness and redness are really in porphyry in the light, when it is plain it has no colour in the dark?

Because light impacts a viewer’s ability to see the red or white color of porphyry, Locke argues that this light-dependence renders colors secondary to the material of porphyry itself. While Newton’s prismatic color had extracted color from the material object, he allowed for color’s material presence at the level of the photon. In contrast, Locke centered the question of
porphyry’s redness or whiteness in human perception. In his conception, the stone had no intrinsic color and so he relegated color to a secondary status, in contrast to the stone’s empirically true characteristics such as form or shape. These scientific and humanist developments in the intellectual tradition of the late seventeenth and early eighteenth centuries have shaped subsequent approaches to color with the general result that today color becomes a secondary quality of the object, while form, or shape, remains primary.

Although neither Newton nor Locke seem explicitly invested in the issue of color and gender, the terms matter (hulê) and form (morphē) have a gendered history going back to ancient Greek philosophical explorations in Plato and Aristotle, which will be taken up in more depth in subsequent chapters. In short, Aristotle’s engagement with Plato’s *Timaeus* genders form masculine and matter feminine, and color’s materiality retains that gendering in antiquity. By the seventeenth century, a dematerialized understanding of color as hue dominates, but this historical gendering clings to color on the grounds of its materiality, with the result that the hierarchy of form as primary and color (and the senses) as secondary in Locke effectively elevates (masculinized) form over (feminized) color.

Seeing ancient Mediterranean art and architecture through the lens of modern dematerialized color and its associated hierarchies filters out the constitutive role of material color in Mediterranean antiquity. As antiquarians encountered and debated additive colors on architecture and sculpture throughout the Mediterranean in the eighteenth century, this different notion of both the nature and status of colors shaped how they understood what they saw. In the late eighteenth century, for example, the German philosopher Johann Herder blithely argued that additive colors make sculpture ugly because color is not form (“Farbe nicht Form ist”) and remains either undetectable or disruptive to haptic encounters, which is to say, dematerialized color counted less for Herder because it could not be touched.23 Intersecting questions of gender and racialized constructions of Western exceptionalism swirled in the background of such pronouncements.

Following Newton’s extraction of the hues of the spectrum from their material substrates, modern scholars, including British prime minister and classicist W. E. Gladstone, sought and failed to find color-words that straightforwardly named hues independently of their materiality and many color-terms were lost in translation.24 Efforts to revise this nineteenth-century erasure and expand the lexicon of ancient Greek and Latin color-terms continue, although these have often been carried out independently of material analysis.25 Color, however, has always encompassed more than hue. Corresponding to Munsell’s twentieth-century description of color-space made up of hue, saturation, and brilliance, in the ancient Mediterranean, hues, brilliance, and variegation made up material colors.26

Brilliance, or the shining, reflective capacity of different hues, is an important aspect of material color’s animacy. Ancient Greek accounts of color regularly emphasize the importance of luster, shimmer, and brilliance – of *lamprotēs* – in

26 For Munsell’s system, see discussion in footnote 12 and “Munsell Color”: https://munsell.com/
In a discussion of the many colors painted on sculptural surfaces, E. Walter-Karydi, “The Emergence of Polychromy in Ancient Greek Art in the 7th century BC,” in Les Arts de la couleur en Grèce ancienne . . . et ailleurs, ed. Philippe Jockey (Athens: École Française d’Athènes, 2018), 95–114, argued that ancient Greek artists and writers prioritized darkness and lightness and characterized Homer as uninterested in hue. On dark/light contrasts see Irwin, Color Terms in Greek Poetry, 111–200; for the replication of this narrative outside of ancient Mediterranean art and material color, fits comfortably with narratives of dematerialized shining white or light. In a circular turn, these texts seem to suggest the centrality of the shiny effects of unadorned white marble. If Greek writers appeared not to name dematerialized hues and Greek artists not to paint sculptures (with marble as the default material), both ancient Greek text and image could retain the “noble simplicity” celebrated by Winckelmann and foundational to modern aesthetics. Indeed, these conventions seep into even modern scientific description. Analyzing how scientists inscribe whiteness into naming and labeling, physicist Chanda Prescod-Weinstein writes of naming conventions in quantum chromodynamics, “Color” and “white as neutral” are here not as reflections of how the universe works, but rather how a homogeneous, white scientific community comes up with new names for stuff. Part of science, classics, see Alan E. Shapiro, “Artists’ Colors and Newton’s Colors,” Isis 85, no. 4 (1994): 603.


Among the ancient sources on luminosity and brilliance as a component of color, see Pl. Ti. 68c, and on the addition of wax to increase it, Pliny NH 35.36–97. Scholars who have recently analyzed to lampron include Neer, Classical Style; Duigan, “Color and the Deceptive Gift,” 80; Andrew Stewart, Greek Sculpture: An Exploration (Cambridge: Cambridge University Press, 1990), 36–42 and Irwin, Color Terms in Greek Poetry, 24–25, 79–80.

28 Pl. Ti. 68c 5–6.

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within his cosmology, he argues that particles of black and white, or water and fire, combine to make up the other colors of the visible world.\textsuperscript{36} Aristotle also includes black and white among material colors that can be mixed together to produce other colors (\textit{De Sensu} 4.4.422a20–25), although he explores a range of possible primary colors across his extant texts and does not consistently commit to black and white as the two primary colors.\textsuperscript{37}

In addition, many extant objects also include black or white materials among the many colors used by artists. Examples include a black-glazed water jar depicting the poet Sappho and her lyre, the black tiles described by Pausanias making up the olive-oil reflecting pool in front of the gold and ivory statue of Zeus at Olympia (5.11), obsidian pupils of inlaid eyes, ivory or bone eye-whites of inlaid eyes, the ivory parts of the statue of Athena Parthenos, and white paint on the statue of Herakles on the mixing vessel. Rather than including black and white within a broader spectrum of material colors and approaching ancient Mediterranean art with this in mind, however, modern researchers have brought a misaligned and idealizing understanding of dematerialized black and white to their search for color in the ancient Mediterranean. A reception tradition that has reproduced the forms of ancient Mediterranean art and architecture almost exclusively in black-and-white technologies has only increased our distance from the very different ancient thinking about black and white as material colors. Most significantly, scholars have emphasized a tonal binary of white/black or bright/dark (\textit{lampron/melas}), what Jean-Pierre

Vernant described as “opposite poles of luminosity and darkness” as the priority in ancient Mediterranean color theory and practices.\(^3^8\) Emphasizing a black/white or brilliance/darkness binary as something different from or beyond material color conforms to the familiar black-and-white aesthetics produced by the history of reproductions and replications.\(^3^9\) Instead, artists and philosophers in the ancient Mediterranean


worked with and valued black and white as part of the range of material colors through which objects, buildings, and bodies were formed.

In addition to reproductive technologies selecting for black and white forms, loss and excision of additive colors over time has often left us with only the material support extant—the statue, relief, or plaque. As a component of material color beyond hue, brilliance influences the appearances of material colors and this becomes particularly relevant in connection with the different material supports on which artists layered additive colors, as pictured in the scene on the Herakles mixing vessel. When additive colors are layered onto marble supports, for example, the crystalline structure of marble interacted with these pigments, working together to construct the object’s material color (variegation, brilliance, and hues). Different material supports, such as terracotta or limestone, each interact differently with additive pigments that have their own materiality. Traces of pigments that remain extant on marble surfaces, such as the pigments on various marble statues of women or korai, hint at the way in which pigment layers might work together with their crystalline substructure, but much of the effect has been lost over time.

Most physical reconstructions of color on ancient sculpture are carried out on white plaster casts, which afford a white support, but one without the crystalline structure of marble and its associated brilliance. Selected reconstructions executed on marble supports demonstrate the ways in which a marble substructure joins together with surface colors.40 Additive colors produce brilliant assemblages of which the surface pigments and the material substructures are both parts fitting together a polychrome whole.

In addition to brilliance, variegation was an equally important component of material color that also produced animacy. Adeline Grand-Clement analyzes both textual and polychrome material manifestations of variegation (poikilia), a practice and concept that includes the “effect produced by the assemblage of different colors and materials on an object,” also encompassing notions of intricacy and animacy.41 This analysis connects variegation and material color, capturing the part-to-whole relationship produced by fitting together color-parts into assemblages and also the ways in which artistic variegation expands to modes of thinking. Other scholars

40 Brinkmann, Bunte Götter, 148–155. In addition to amplifying the brilliance of the stele’s colors, a marble substructure absorbs less pigment than plaster and so the more expensive substructure requires less pigment to cover its surface with colors. The author had the opportunity to experiment with layering historical pigments onto both marble and plaster substructures in the Materials Lab of the Harvard Art Museums and discovered firsthand that plaster absorbs pigment, producing a far more matte finish, while the marble surface soaked in less pigment, increasing its refraction even without additional surface treatments, “Materials Lab Workshop: Investigating Color in Art,” Harvard Art Museums, December 3, 2019. One example of a painted reconstruction on a marble support, the funerary stele of Paramythion, offers a glimpse of the ways in which pigments and marble would have worked together to combine hue and brilliance. Building from both traces visible to the naked eye and under ultraviolet light, the Stiftung Archaeologie team has proposed two reconstructions. Both have a red background and blue details (although different shades) and one includes additional and more speculative details in gold, pink, and green. Building from both traces visible to the naked eye and under ultraviolet light, the Stiftung Archaeologie team has proposed two reconstructions. Both have a red background and blue details (although different shades) and one includes additional and more speculative details in gold, pink, and green. Stiftung Archaeologie, Variant A: www.stiftung-archaeologie.de/Paramythion_A_fullsize.html and Stiftung Archaeologie, Variant B: www.stiftung-archaeologie.de/Paramythion_B_fullsize.html; Giovanni Verri, “Broad-Band, Photo-Induced, Steady-State Luminescence Imaging in Practice,” in UV-Vis Luminescence Imaging Techniques (Valencia, Spain: Editorial Universitat Politècnica de València, 2020): 61–102.

have also identified the significance of variegation for ancient Greek aesthetics. For example, Andrew Stewart attends to the variegation of different materials such as gold, ivory, silver, bronze, copper, wood, representations of embroidery, inlaid eyes, crystalline marbles, clays, glass, enamel, and pigments. Marcel Detienne and Jean-Pierre Vernant analyze variegation in ancient Greek texts to establish a connection between dappled things and intricate thinking. Building on this analysis in his study of painted ceramics, Richard Neer emphasizes the ways in which variegation encompasses changeableness, adaptability, and nimble thought and speech, concepts that shot through painter’s patterns. Through these examples of painted ceramics and carved statues, Neer argues that “poikilia names the complexity of pictorial depiction itself, the uncanny way in which images are twofold ... Poikilia is the Greek word for this doubleness of seeing.” Such complexity extends to the shifting perceptions of material colors and the animacy that polychrome assemblages enact. Amy Lather argues that the shared variegation of objects, bodies, and ideas demonstrates that these seemingly distinct categories were understood relationally and that the term poikilia bridges humans and things. Each of these vital engagements with variegation considers it as an overarching concept, whereas my focus in this book is on how variegation along with brilliance and hues (khrōmata) worked as aspects of material color.

ADDITIVE COLOR AND ASSEMBLAGE

Analysis of bodies in classical art has long been at the center of art historical engagement. That engagement, however, has most often focused on the idealized form of the nude body, an idealization that has traded in the homogeneous, monochrome surface. In their visible plurality, material colors undermine such idealizations. In “Whitescapes,” the opening chapter to his book Chromophobia, David Batchelor writes, “but it is one thing not to know that Greek statues were once brilliantly painted; it is another thing not to see colour when it is still there.” Batchelor goes on to draw an important distinction between singular white and plural whites: “in being plural, they are therefore not ‘pure.’ Here is the problem: not white; not whites, but generalized white – whiteness – is abstract, detached, and open to contamination by terms like ‘pure.’” The intellectual tradition undergirding art history is shot through with discourse on purity – pure language (Adamic, or before its fragmentation into languages with the tower of Babel), pure reason (unconditional, as in Kant’s Third Critique), or pure form (from Plato to Riegl). The material contingency of colors has been among the casualties of maintaining such fictions of purity. The erasure of colors from ancient Mediterranean art and in particular ancient Greek sculpture has served to craft a myth of

42 Stewart, Greek Sculpture, 37–40.
45 Neer, The Emergence of the Classical Style in Greek Sculpture, 113.
46 Ibid., 138.
47 Lather, Materiality and Aesthetics in Archaic and Classical Greek Poetry, 4.
49 Ibid., 12–13.
classical art’s singular whiteness, where whiteness serves as a cipher for being whole and pure. Colors become, under this rubric, plural and impure. In contrast with this construction of whiteness, the recovery of material colors in ancient Mediterranean art shows us, instead, artistic practices that prioritized plurality, fitted-togetherness, and variegation.

For hundreds of years, debates over the presence or absence of color in ancient Mediterranean art have centered around the application of paint on white marble sculpture and architecture. Although reduced to these narrow terms, this debate has been framed as about the presence or absence of all colors in the ancient Mediterranean – on art, in language, and of living and material bodies. Marbles have different colors. Not all surfaces are marble, not all colors are applied paint, and not all material colors appear on an object’s surface. Although we need to continue to push against the reinscription of whiteness in experimental reconstructions themselves, Aimee Hinds argues persuasively that the specificity of additive colors on sculpture disrupts the invisibility of whiteness as a construct.\(^5\) Recovering material colors thus recovers a broader plurality in the art that they form.

That plurality is also not always added in the service of mimesis or naturalism. The painter of the Herakles mixing vessel, for example, used colors to distinguish between the living bodies – the painter, his assistant, the divine audience of Zeus and Nike, and Herakles encountering his own image in the making – and the statue. Human and divine bodies are rendered in the fired terracotta of the red-figure technique.\(^6\)

The sculpture of Herakles, in contrast, has been painted white. This division – fired red for living bodies, added white for sculpture – does not mimetically represent either, but highlights their different categories, living and non-living, in the scene.

Although the reds and blacks of the scene have been fired into the vessel’s form in the kiln, the painter added whites, yellows, and oranges after firing. In the depiction of the brazier, orange and white flames flicker up around the circumference of its wide opening and lick around its edge. These oranges and whites depict the means by which the assistant heats tools for painting the statue in the scene, and these flames are also made up of additive colors painted onto the surface of the mixing vessel. The painter of the mixing vessel pictures the practice shared across the production of ceramics and sculptures of adding colors through painting a surface. Recovering ancient material colors also recovers these sorts of coloristic relationships across media that have historically been studied separately.

In addition to these transmedial relationships, the colors of the brazier also summon a host of connected sensory experiences, what Grand-Clément describes as the polysensory dimension of poikilia.\(^7\) The brazier brings to mind the low heat used to warm the beeswax mixed with pigments, as well as the scorching heat of the kiln in


which the main colors and the form of the mixing vessel were fired and fixed.

Heat from a flame melts the wax with which pigments are blended, heats the kiln in which ceramics are fired, and also affords one of the means by which material colors change. Some Greek philosophers, including Empedocles and Plato, also conceptualized flame as a space within which the materiality of color and vision emerges, a subject I will return to in Chapter 4.

The scene painted on the mixing vessel also brings forth the sounds of wheel, kiln, and fire, and the smell of beeswax, smoke, and each individual powdered pigment mixed with the wax. Encaustic pigments must be applied when the wax is warm, pliant, and unfixed. As beeswax cools, it hardens into the polychrome skin of a sculpture or vessel and on the skin of the artists who work with it. Beeswax’s hydrophobia, malleability, and antibacterial preservation among other celebrated properties made it an important material in the ancient Mediterranean.

Wax was regularly used as a binder for pigments, as both the scene on the mixing vessel and recent evidence from the Parthenon in Athens demonstrate.

Encaustic pigments (additive colors) thus act as both a surface layer and a kind of skin, enclosing and connecting with the object they cover and of which they are part.

As integrated, polychrome surface, additive colors offer a distinct subset of assemblage that the Herakles mixing vessel foregrounds. Additive color is the practice of layering polychrome materials onto surfaces, while assemblage is the practice of fitting together polychrome wholes from smaller material color-parts. A surface layer is both built up from pigment-parts and is also one part of the polychrome whole. In the example of the mixing vessel, clay is the material substracture, while its additive colors include the slip that fires black and red, as well as the added whites and oranges. The potter and painter fit together clay, slip, and pigments to form the mixing vessel as well as to represent a scene that foregrounds a similar relationship between additive and assembled colors in the depiction of the painter adding colors to the surface of the statue of Herakles. This object makes visible the ways in which additive colors operate as a distinct subset of assemblage and the relationship of these additive colors to their material support produces a kind of assemblage. Despite this connection between additive and assembled color, the reception of these color practices has unfolded very differently: additive color, especially paint on a marble surface, has generated deep resistance for the ways in which it disrupts an ideal of pure form, while objects of assemblage have been sidelined as craft or remade through black-and-white reproductions into monolithic or monochrome forms. Drawing out this relationship between additive colors and assemblage opens up a robust period language of material color relevant to both modes of making polychrome.


A LANGUAGE OF MATERIALS

The language of material color deployed in ancient Greek texts emphasizes joining, fitting together, and part-to-whole relationships of material colors. As the following selection of examples from philosophy, epic and lyric poetry, and epigraphy demonstrate, this language of materials traverses genres just as material colors traverse artistic media. Encompassing hue, brilliance, and variegation, the language of material color often describes objects produced through assemblage. In their materiality, additive and assembled color converge and as a subset of assemblage, additive practices, such as painting, slipping, gilding, and burnishing surfaces, can also be described by this language of material assemblage. Both modes of making polychrome – additive and assemblage – build up forms by connecting material color-parts and the language of material color encompasses fitted-together materials (assemblage) and also colors layered onto a surface (additive color).

Poetic descriptions forge a period language of material color already visible in Homeric epic and into later periods and genres. The phrase “language of metals” describes the symbolic metals of the different mythical ages in the Hesiodic development of the world (gold, silver, bronze, iron), but does not explicitly emphasize the material colors of these metals. Metal alloys and their material effects are, however, an important part of material color and we can expand this notion of a “language of metals” to a broader language of materials, which also includes stones, glass, botanics, and earths. Color-words often preserve their material referents and could signal various aspects of material color – hues, variegation, and brilliance – all of which a language of materials registers.

Many ancient poets worked with this expanded sense of material color and Sappho’s poetic fragments, for example, preserve a vibrant language of color. The unevenness of her reception has resulted in an equally uneven attention to her language of color and despite her focus on crafting vibrant material worlds, her poetry is rarely brought to bear on discussions of ancient Mediterranean polychromy. Suppression of Sappho’s work – she was not read or recorded in the Middle Ages, likely due to her gender and the world of feminine intimacy that she crafts in her poetry – reduced attention to a significant queer woman poet from ancient Greek literature, one whose craft was cited by Longinus in On the Sublime in the second century CE. When her poems disappeared, so did the world of material colors that she describes, and so, her work and the color worlds that they craft were inaccessible in significant historical moments for the reception of ancient Greek and Roman art. The

60 On this relationship between material-effects and color, see Bradley, Colour and Meaning, 233.
61 On Sappho’s reception, Margaret Reynolds and Sappho, The Sappho Companion. (New York: Palgrave for St. Martin’s Press, 2001). In On Famous Women (1374), Boccaccio constructs a version of Sappho’s biography with no access to her poetic fragments; in illustrated versions of the text, such as this woodcut series from 1487, the ancient Greek poet is represented in contemporary (for the Middle Ages) dress and playing a different kind of lyre from the one she is pictured with antiquity (Louvain: Aegidius van der Heerstraten, 1487): https://digital.bodleian.ox.ac.uk/objects/fzc3455a-490b-4616-97dc-443547ob78f4/).
62 While her work itself was inaccessible, the construction of Sappho as a historical figure persisted with the result that she appears in Boccaccio. Also notable is a passage in Vasari in which he suggests that Sappho might have been a man, Giorgio Vasari, “The Life of Madonna Properzia de’ Rossi, Sculptress of Bologna [c. 1490–1530]” The Lives of the Artists, Julia Conway Bondadella and Peter

58 For a wide-ranging exploration of references to artistic colors on sculptures in Greek and Latin texts, see Felix Henke, Die Farbigkeit der antiken Skulptur Die griechischen und lateinischen Schriftquellen zur Polychromie (Reichert Verlag, 2020).
gendering of the phenomenon of color and Sappho’s feminine gender suggest that these erasures are connected.

Parts of Sappho’s oeuvre were preserved in the citations of later male authors, and other parts have been recovered from papyrus fragments (woven reed paper) excavated from a trash dump at Oxyrhynchus, Egypt. On one of them (P.Oxy 2076, third century c. CE), a scribe has written “Sappho” in the lower right, as well as parts of Sappho’s Fragment 44, a poem about the wedding of Andromache and Hector that describes gold bracelets, purple robes, silver cups, ivory, as well as fragrant materials such as myrrh, cassia, and frankincense (Figure 18).63 Between the citations of Sappho by other authors and the papyrus fragments, we can piece together nearly 190 fragments, and many of these poetic fragments preserve Sappho’s rich language of material color.

Sappho’s poetry captures material color’s variegation. Indeed, variations on the word poi-kili run through her poetry (1, 39, 44, 98b, 168c). One fragment reads simply, “mingled with all kinds of colors” (152).64 Gold is another celebrated material and metaphor. Sappho speaks of Aphrodite’s golden temple (1) and golden crown (33), Apollo’s golden hair (44a), and also of golden arms (6), gold bracelets (44), gold cups (192), golden sandals (103, 123), gold (96, 127), and the state of being golder than gold (156). Fragments also describe silver cups and ivory (44) and the state of being whiter than an egg (167). Purple dye, produced from murex shells and traded throughout the Mediterranean and ancient Near East, features throughout: clothes dyed purple (44), a purple cloak (54), a saffron and purple peplos (92), purple rugs (92), purple hair-ties (98a), purple handcloths (101). Several poems mention hair, notably yellow-haired Helen (23), hair yellower than a pine torch (98a), black hair whitened in old age (58), as well as the decoration of hair with ribbons and headpieces worked through with colors (98a) or crowns woven of flowers. The fragments speak regularly of the colors and the sensory world of flowers, plants, animals, and soil: crowns woven from stems of anise (81), crowns woven from violets and roses (94), necklaces of flowers (94), fields of flowers, trampling hyacinth (105b), hyacinth-colored (166), gathering flowers (122), violets gathered in someone’s lap (21, 30, 103), arms like or of roses (53, 58), myrrh, cassia, and frankincense (44), golden flowers (132), gold chickpeas (143), a ripening apple (105a), an apple grove (1), celery (189), honey and honeybees (146), a white goat (40), and the black earth (16, 20). Sappho also speaks of sources of darkness and light: black sleep (151) the silvery, shining full moon (34), the bright light of the sun (56, 58), the rosy-fingered moon (96), light on Anaktoria’s face (16), and of shining and staining (4, 34).65 Throughout these poetic fragments, her color language moves between shining, variegated materials, changing colors on and of the earth, and the subjective changes of color on and in the body with changes in emotion (fire, greener than grass, 31, burning, 38, 48). Sappho’s colors range from the abiding metal of a gold cup to fleeting flower-crowns. Such a long and varied list pictures Sappho’s material colors, from the enduring to the ephemeral.


63 A second papyrus fragment (12332) preserves additional lines and in combination the two fragments preserve a significant part of Sappho’s ancient poem.


Figure 18 Papyrus fragment with part of Sappho Fragment 44 written on it. Woven reed paper with ink. P.Oxy 2076 (Sappho 44). Courtesy of The Egypt Exploration Society and the University of Oxford Imaging Papyri Project.
Despite Sappho’s rich language of material color, her color-words did not register in the face of claims that ancient Greek texts (or really Homeric epic) do not record color-words. Bracketed by her gender, Aeolic Greek dialect, eastern Mediterranean birth, and “lyric I,” the singular historical position of her work (fragments of other female authors do survive, but none as celebrated) contributed to its invisibility as a source of ancient Greek color. For example, the rhetorical debate over the comparative richness of Greek and Latin color-words written by the second-century CE Latin grammarian Aulus Gellius in Attic Nights (2.6) excluded Sappho from the poets under discussion. Even in antiquity, Sappho’s colors were sidelined, while the complexity of her meter (the “Sapphic stanza”) was widely celebrated and imitated. Another way to say this would be that people imitated the form of Sappho’s poetry without hearing or registering her variegated words.

Too female, too queer, too Eastern, too distant from the Athenian democracy around which so many questions of color and its absence have been built up: Sappho’s seeming singularity always risks marginalizing her contribution. And yet, Sappho records a world of material colors that aligns closely with those colors listed on inventories of textiles dedicated in the sanctuary, as a practice of kosmēsis and care which will be discussed in Chapter 2. In addition to displaying a collection of colorful textiles, the inventory preserves many color-terms, as analyzed by Liza Cleland and Lloyd Llewellyn-Jones. Not only does this list document material colors that do not regularly survive in the archaeological record, but because 90 of the 158 garments recorded are listed by their material color, the inventory records an incredible list of color-terms. These include more familiar words such as purple, saffron, and

70 Kirk, Ancient Greek Lists, 40; 116–117. IG IIa1514.
71 Ibid., 138. 72 Ibid., 136.
sea-green, but also “frog-colored” and “quince-colored,” terms that communicate the relationship between objects and color-concepts that material color encompasses (Figure 20).

While the list invites its readers to picture these colors, the stele does not depict them and the sort of textiles they record only survive as the occasional extant fibers in the archaeological record. Nor were the sorts of colors described by the inventory lists fixed and unchanging. Llewellyn-Jones describes the intense labor that went into dyeing and re-dyeing fabrics, practices that track changes in a garment’s colors over time. Dyes and fibers bond, entangling colors and textiles, but these colors, like applied additive pigments, demand maintenance and care, which could include mending and re-dyeing. While depictions of textiles in other media, such as on fired ceramic vessels, often depict textile patterns, they less frequently record the colors that crafted these patterns. This partial inventory list both showcases the many colors that would have been visible in ancient textiles worn by living women and adorning statues, and also draws attention to the additive colors that might once have been painted onto representations of textiles in other media.

Neither these epigraphic color-words nor Sappho’s variegated lyric counted in W. E. Gladstone’s pronouncement in the nineteenth century that the ancient Greeks did not see and use a full range of colors. As his primary


evidence for the optical deficiency of the ancient Greeks, Gladstone offered up the supposed absence of color-terms in Homeric poetry, arguing that they did not name colors because they could not perceive them. In Gladstone’s post-Newtonian world of perceptual optics, materials did not count as a palette. Because Gladstone mined Homer for words clearly denoting specific hues, as he might expect in modern English, he failed to account for the material nature of Homer’s color-terms, in which hue and material are bound together. This allowed Gladstone to argue on a textual level for the lack of importance of color-words in Homer specifically and in ancient Greek more broadly and then to postulate a physiological deficiency structured by environmental determinism by way of explanation. Gladstone attributed this deficiency to the comparative westernness of the Greek-speaking Mediterranean, situating color to the east; in addition, his text-driven account countered the growing material evidence for the many colors of ancient Mediterranean art and architecture that had accumulated by the nineteenth century.76


76 Gladstone writes, “But in examining the question from the works of Homer we must bear in mind, first, their very early date, and, secondly, the likelihood that heroic Greece may probably have been far behind some countries in the east in the use and the idea of colour, which has always had a privileged home there,” W. E. Gladstone, Studies in Homer and the Homeric Age (Oxford: Oxford University Press, 1858), 2: 491; Gage, Colour and Culture, 7; Charlotte Ribeyrol, “The Changing Colours of Nineteenth-Century Art and Literature,” Word & Image 36, no. 1 (2020): 1–6.
While the physiognomic explanation has been dismissed as nineteenth-century fancy, Gladstone’s claim that Homeric poetry does not mark colors and his related attribution of colors to the East have both remained remarkably tenacious. Since his pronouncement, textual scholars have worked to counter it, building up lexica of color-terms. Like Sappho’s fragments and the Artemis Brauronia temple inventories, Homeric epic offers rich testimony of material color.

The term kuanos, for example, names the material stone lapis lazuli, but also could include a range of material effects that the blue micaceous stone might produce. Tracking kuanos in Homer along with other material colors with which kuanos was fitted together demonstrates some of the ways in which material color language operates. Among the colors for which Plato later offers color-recipes in the Timaeus, kuanos describes both lapis lazuli and the color blue and demonstrates the polyvalence of material color-words in action. The Greek word kuanos has a range of possible meanings, including: lapis lazuli, blue copper carbonate, dark blue enamel, a cornflower, a bluebird, and water. The term can denote the deep blue material, hue, and shimmering effects of lapis lazuli, the variegation of its golden micaceous inclusions, or all of these material effects at once. In the ekphrastic narration of the shield of Achilles in the Iliad, for example, kuanos names the blue enamel laid by the metalsmith god Hephaestus into the variegated alloys of the shield that he forges as armor for Achilles. A popular translation of this vivid description of the mythical shield of Achilles into English by Robert Fagles captures the particulars of how this language of material color pictures polychrome variegation:

And he forged a thriving vineyard loaded with clusters, bunches of lustrous (kalên) grapes in gold (khruseiēn), ripening deep purple (melanes) and climbing vines shot up on silver (argureēsin) vine-poles.

And round it he cut a ditch in dark blue (kuancēn) enamel and round the ditch he staked a fence in tin (kassiterou).

Material color-terms capture the virtuosity of the world created on the shield – gold ripening into purple, dark purple vines climbing silver poles, and saturation of the ditch forged from lapis lazuli and cut in striking contrast to the bright tin fence that surrounds it. The choice to render melas in its relation to the grapes as “deep purple” rather than the more common rendering of “dark,” which translator Richmond Lattimore chose, describes the progressive darkening of the ripening purple grape.


81 In the Greek, kalên and chrusēiēn are two adjectives describing the vineyard, but Fagles incorporates the property of lustrousness (what elsewhere may be called to lampron) into the definition of beauty. That which is beautiful is lustrous, hence “lustrous grapes in gold” rather than “he set up a vineyard heavy with grapes, beautiful and gold.” Il. 18.561–2; Homer, The Iliad, trans. Robert Fagles (New York: Viking, 1990).


83 This infusion of color contrasts sharply with descriptions of the Homeric world as one that favored value (light/dark) and disregarded hue, on which, see Walter-Karydi, “Emergence of Polychromy in Ancient Greek Art,” and Irwin, Color Terms in Greek Poetry, 111–200. Lightness and darkness do not replace hue but work in tandem with hues as part of material color (khrōma).

84 Lattimore translates: “He made on it a great vineyard heavy with clusters, lovely and in gold, but the grapes upon it were darkened and the vines themselves stood
Similarly, Fagles renders the ditch in “dark blue enamel” for the adjective _kuaneos_, where Lattimore chose “a field ditch of dark metal.” Lattimore’s choice of “dark” for both _melas_ and _kuaneos_ substitutes tonal difference for hue. In the case of the grapes, Fagles’s rendering captures the way in which the material relationships of chromatic words can shift their meaning, while the description of dark blue enamel names the material that the poem juxtaposes with the fence of tin. The metals and stone of each individual color-word shimmer, and their careful juxtaposition in the text crafts dazzling variegation to animate the ekphrastic object.

Another ekphrasis of mythical armor, the swords and breastplate that Agamemnon dons for battle in the _Iliad_ (11.17–30), also exemplifies the language of material colors that describe the armor’s assemblage of material color-parts. In addition to greaves, swords, and sheaths of gold and silver, his body armor is worked through with concentric circles of lapis lazuli (ten) in concert with circles of other bright and valuable materials, such as gold (twelve), and tin (twenty). Serpents of shimmering lapis lazuli out through poles of silver. About them he made a field-ditch of dark metal and drove all around this a fence of tin; and there was only one path to the vineyard, and along it ran the grape-bearers for the vineyard’s stripping.” Richard Lattimore and Richard R. Martin, _The Iliad of Homer_ (Chicago: University of Chicago Press, 2011), 431–412.

Homer, Lattimore and Martin, _The Iliad of Homer_, 390.

On mobility as a feature of the image of the Shield of Achilles, see Guy Hedreen, _The Image of the Artist in Archaic and Classical Greece: Art, Poetry, and Subjectivity_ (New York: Cambridge University Press, 2016), 129–131, 135–138. Notably, while the shield exists only through its poetic ekphrasis, Alexander Pope attempted to depict and diagram the world of the shield in pen and ink to accompany his English rendition of the poem in 1720: ‘Part of the final lines of Achilles’ lament for his friend Patroclus in Book XIX of the _Iliad_; with Pope’s attempt to envisage the shield forged by Hephaestus for Achilles,” 1712–1724, Add MS 4808, British Library. This diagram both materializes the shield and also renders its material colors in monochrome ink, a transference that elides the vivid polychromy of the Greek.

Lattimore uses “cobalt” instead of lapis lazuli, which at least captures the blue hue, but perhaps misses the high value of the material itself in connection with the rich metals of the shield: “Now there were ten circles of deep cobalt upon it, 25 and twelve of gold and twenty of tin. And toward the opening at the throat there were rearing up three serpents of cobalt on either side, like rainbows, which the son of Kronos has marked upon the clouds, to be a portent to mortals.” Homer, Lattimore and Martin, _The Iliad of Homer_, 253–254. Agamemnon received his breastplate as, we are told, a guest-gift from the mythical King Cinyras, a son of Apollo. His armor thus bears some direct connection to divinity, although unlike the armor commissioned for Achilles, it was not forged by a divine hand. It is worth noting that Hephaestus willingly forges the arms for Achilles in reciprocation for Thetis having saved him when he was thrown out of Olympos. In this respect the shield he fashions for Achilles adheres to the reciprocal demands of aristocratic gift-exchange, albeit in slightly altered terms. On aristocratic gift-exchange, see Leslie Kurke, _Coins, Bodies, Games, and Gold: The Politics of Meaning in Archaic Greece_ (Princeton: Princeton University Press, 1999), 71–73, 103–111, 121–129, 143–147.

Lapis lazuli is often joined with other materials in this way, e.g. the cornice above the bronze walls of Alkinoos’s palace is formed from lapis lazuli (Od. 7.87), or the frequent juxtaposition of lapis lazuli and gold in Mesopotamian and Egyptian art, on which see P. R. S. Moorey, “Blue Stones in the Ancient Near East: Turquoise and Lapis-Lazuli,” in _Cornaline et pierres précieuses: La Méditerranée, de l’Antiquité àl’Islam: actes du colloque organisé au musée du Louvre par le Service culturel les 24 et 25 novembre 1995_, ed. Annie Caubet (Paris: La Documentation française, 1999), 177. Irene Winter, “The Aesthetic Value of Lapis Lazuli,” in _ibid.,_ 49. For the lengthiest discussion of the rainbow in
of material color animates the polychrome armor to delight and awe listeners and readers.

Homer’s texts offer other possible meanings for the term kuaneos, each linked to magic, divinity, and mourning. Thetis covers herself in a dark mourning veil and kuaneos describes that darkness of hue and saturation (Il. 24.94). Demeter wears a similar cloak when mourning Persephone in the Homeric Hymn to Demeter (43.319). Kuaneos also describes the following: the magical cloud in which Apollo hides the Trojan Aeneas (Il. 19.534), the cloud that envelopes Polydorus after Achilles has killed him (Il. 20.418), the permanent darkness surrounding the mountain housing Scylla’s cave (Od. 12.75), as well as the loamy earth at the bottom of Charybdis (Od. 12.243). Kuaneos can also characterize divine or heroic hair: Poseidon’s dark locks (Il. 13.563; 14.390; 20.144; Hes. Theog. 278), Hector’s hair as Achilles drags the corpse behind his chariot (Il. 22.401–402), and the brilliance of Zeus’s eyebrows as he renders judgment (Il. 1.528).

When Athena boosts Odysseus’s appearance before he reveals himself to Telemakhos, she makes his skin darker and his hair kuaneos (Od. 16.176), giving his hair the deep shimmer associated with kuanos, and with immortality and divinity. She makes him something more than mortal Odysseus. Telemakhos, upon seeing his father changed, wonders if he is a god, and remarks “even your skin (khrōs) has changed.” This passage in the Odyssey highlights both the wondrousness and the changeableness of the polychrome surface. The changes that Athena has wrought in Odysseus manifest on the surface of his body through his changed khrōs, but these effects suggest changes throughout his whole body that become visible in and through his skin. Sappho marked a similar operation of changes within the body registering as color changes when she described her speaking subject as “greener than grass / I am and dead – or almost / I seem to me” (31). Being green shows as proximity to death. Change in both of these textual examples manifests on the surface of a body, but indicates changes that are of the whole body. Carrying this logic into the realm of material objects and bronze in particular, Sanchita Balachandran writes of the ways in which changing surfaces record histories: “The stories we tell come from the surface.” Living and material bodies make make interior changes visible on their surfaces through their changing colors. These examples of material color language in poetry and epigraphy show us the ways in which material colors could build up forms – Achilles’s shield, Agamemnon’s breastplate, a blue peplos dedicated to Artemis Brauronia, Sappho’s crowns of flowers – from material color-parts. These selected passages register a language of material colors that can apply to assemblage and additive colors (surface layers), provided that we recognize additive color as a subset of assemblage with

ancient Greek, see Arist. Mte. 3.2–5. Aristotle describes the bands of individual colors of the rainbow as made up of tiny fragments of cloud that reflect each particular color. These cloud fragments cohere to form the band of that color. See also Empedocles B30 and Katerina Jerodidakonou, “Empedocles on Colour and Colour Vision,” Oxford Studies in Ancient Philosophy 29 (2005): 21.

Other examples include kuanostolos in Bion 4–5, and kuanos de kalumma in Hom. Hymn to Demeter 43.

While neither Hector nor Odysseus are divine, Odysseus receives his kuaneos appearance from the goddess Athena, and Hector his only after death, and it has the effect of both likening him to the gods and distinguishing him from those who still live.

Poseidon’s epithet “lapis-haired” (often rendered “dark-haired”) aligns with the descriptions of the hair of other divine and divine-adjacent beings.

92 Sappho mobilizes a similar poetics of khrōs, especially in Fragment 31. On Sappho’s double-consciousness, see John J. Winkler, The Constraints of Desire: The Anthropology of Sex and Gender in Ancient Greece (New York: Routledge, 1990), 162–176, who reads Fragment 1 alongside Iliad 5.

a shared vocabulary. These examples further make visible the ways in which a language of material color could describe both material objects and living bodies, their aggregate, fitted-together color-parts, and the changeableness of these colors on the body’s surface.

FITTING TOGETHER

Some parts of objects are produced through assemblage – the weave of a cloth, the inlaid eyes of a bronze sculpture, or the cut stones of a mosaic. The ancient Greek verb ἀραρίσκο, “to join,” or in the intransitive “to be fitted together,” describes an important practice of piecing and fitting together parts to form wholes.94 In the context of style and sculpture, Richard Neer analyzes this verb and the related poetic emphasis on synapses and joints.95 “Fitting together” thematizes two important aspects of artistic practice: the significance of parts, and the assemblage that fitting together these parts produces. Philosophers also engaged with these part-to-whole relationships. Additive colors layered onto a surface produce forms through fitting together surface-parts (layers). Material colors emphasize the parts that fit together to form wholes, although at times these same colors can mask other joins.

The notion of assemblage operates both as a materialized artistic practice and as a counter-history of image-making. This practice consists of polychrome parts fitted together to form polychrome wholes.96 Sculptures, buildings, ceramic vessels, mosaics, and paintings are all assemblages of material color-parts. Even the process of producing marble sculpture involved piecing together a substructure and layering on colors, inlays, and attachments. Each polychrome assemblage maps a set of practices that gave rise to each part and to each artist’s act of fitting them together. To produce a painted marble statue, for example, first required the artists to source their materials and that supply-chain connected them to many other people. Laborers, often enslaved, first quarried the stones.97 Sculptors often used local marble, but also imported marble from other places for aesthetic or ideological reasons. Different marbles have their own distinct colors and their use corresponded with distinct supply-chains and labor practices.98 The movement of marbles from both local and distant quarries to the building site or the workshop activated networks of enslaved miners, traders, transporters, salespeople, and recordkeepers, all before the material reached its workshop. An artist might carve parts of the marble in pieces and then fit these parts together using metal claps and pins, creating an assemblage to which they added

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94 On joining and the classical tradition, see Neer, The Emergence of the Classical Style in Greek, 40–46.
95 Ibid., 40–46.
98 In complex building structures, marble could be used in conjunction with other substructure materials, like limestone and terracotta, and marble from different quarries could also be brought together, for example in the juxtaposition of local Elean limestone and imported Parian marble in the temple of Zeus at Olympia, or the juxtaposition of four different types of marble in the Siphnian treasury at Delphi, considered in Chapter 2. On this use of multiple marbles or materials to make buildings, see András Patay-Horváth, New Approaches to the Temple of Zeus at Olympia (Newcastle-upon-Tyne: Cambridge Scholars Publishing, 2015); Richard Neer, “Framing the Gift: The Politics of the Siphnian Treasury at Delphi,” Classical Antiquity 20, no. 2 (2001): 279.
metal attachments, such as weapons, jewelry, or headgear, produced via different techniques, and on which they also layered on pigments mixed with a binder.

In addition to traces on objects, excavation has yielded examples of raw pigments, including those found in a pigment production workshop in the agora on the island of Kos, pigment shops in Pompeii and Rome, and raw pigments excavated on the island of Delos. While these examples are slightly later than the corpus of materials and objects that are the focus of this book, they make visible the range of materials involved in producing polychrome objects and the wide geographic footprints that these materials map.

Once mined or manufactured, pigments could be stored in pellets and in ceramic containers, examples of which are preserved in the evidence from both Kos and Delos. The spectrum of such raw colors includes blues (various tones of Egyptian blue), whites (lead, bone, chalk clay), greens (malachite and verdigris), reds (hematite, ochres, madder lake), yellows (ochres and jarosite), blacks (charcoal, carbon, and bone), purple (Tyrian purple dye), and gilding with gold and electrum. The Koan pigment production workshop was established in an artisan quarter in the agora near the city’s port and also yielded structures for fire set into a terracotta tile floor, pieces of lead and litharge rods, and a number of earth pigments and pellets of Egyptian blue, all of which offer evidence of pigment production in combination with metallurgy. Egyptian blue, one of the earliest artificial pigments, is a calcium-sodium bisilicate of copper and is technically ceramic or glass. Pellets of Egyptian blue as well as discarded misfires were excavated from the workshop, suggesting that the color was manufactured on site. Other local production sites for Egyptian blue have been identified in Memphis, Egypt, and Cumae, Liternum, and Puteoli in Italy, as well as possibly on Delos, bringing these production centers into a community of sources for the synthetic pigment, which was in widespread use across the ancient Mediterranean, Egypt, and the ancient Near East.


100 Ioanna Kakoulli, for example, draws on evidence from extant pigments on objects, pigment production workshops, and vendors from Vergina in northern Greece to Jericho and Alexandria in the eastern Mediterranean and Pompeii in the western Mediterranean, recognizing trade connections and shared artistic practices. Ioanna Kakoulli, Greek Painting Techniques and Materials: From the Fourth to the First Century BC (London: Archetype Publications, 2009), 2 fig. 1.1. Brinkman and Wünsche, Bunte Götter, 238, fig. 390.


102 For an expansive analysis of these material colors see Kakoulli, Greek Painting Techniques and Materials, 37–60.


104 Vitruvius offers an extended description of the manufacture of Egyptian blue (De Arch. 7.11.1). On this, see F. Davidovits, “Notes on the Nature of Creta Anularia and Vitruvius’ Recipe for Egyptian Blue,” in Cleland and Stears, Colour in the Ancient Mediterranean World, 16–21.

105 Marketou, “The Pigment Production Site of the Ancient Agora of Kos (Greece),” 63.

Analysis of pigments excavated throughout the island on Delos conducted in conjunction with analysis of pigment traces on Delian marble statues from the Hellenistic period documents a range of raw and applied materials, including yellow orpiments, red-orange realgar, celadonite, a green earth of potentially local origin, a violet-pink, various blues ranging from light to dark, and lead white as both a surface and a substrate pigment, as well as surface gilding. Notably, while each of the blues included Egyptian blue, pigment, as well as surface gilding.

This analysis of the Delian material colors reveals a complex production and modification of colors. Hilary Becker’s work on the pigment shop discovered during the excavations of the Sant’Omobono church in Rome will expand this picture of the robust commerce that built up around pigments. While lime (processed limestone) was the most popular ground for pigments in the Mediterranean, artists mixed it with fillers to reduce contraction as it dried and these could include fibers, straw, hair, and bodily fluids (blood or urine) and could also include crushed marble, like plasters found on Delos. Such less visible materials also make up the assemblage of materials producing polychrome objects. Binders for pigments could include wax, oil, gum arabic, and egg tempera.

13–34, and on the possibility of local production of Egyptian blue on Delos see, B. Bourgeois and P. Jockey, “Polychrome Hellenistic Sculpture in Delos: Part I,” 502. Notably, while each of the blues included Egyptian blue, some were also mixed with a crushed leaded glass, altering the shade produced. For a detailed technical analysis of these colors, see Karydas, Brecoulaki, Bourgeois, and Jockey, “In-situ X-ray Fluorescence Analysis of Raw Pigments and Traces of Polychromy on Hellenistic Sculpture at the Archaeological Museum of Delos,” ASMOSIA 2003, 811–829. On local production of Egyptian blue on Delos, see B. Bourgeois and P. Jockey, “Polychrome Hellenistic Sculpture in Delos: Part I,” 502.


Kakoulli, Greek Painting Techniques and Materials, 7, 29.

Finishing treatments to protect and shine the surface layer of an object, both sealing and often increasing the brilliance of assembled colors can be found among the materials of polychrome production. To produce polychrome objects, artists mobilized various materials in addition to pigments or dyes with distinct hues and these combinations impacted the appearance and endurance of different material colors. In short, material colors and the varied objects that artists created with them involved a variety of different people, materials, techniques, and skills. Taken together, these layers of colors, attachments, finishing treatments, inlays, and material substructure produce polychrome assemblages from material color-parts.

The example of the Herakles mixing vessel depicts some of these artistic processes. Having sourced the needed clay, a potter (possibly working with a painter) built up the column-krater from coils and added slip before firing. Once the bowl had been fired, a painter (possibly the potter, or possibly a collaborator) painted white, orange, and purple marks onto its surface. These additive colors are parts of the whole polychrome assemblage that makes up the object. While the base on which the statue of Herakles stands in the image retains the red of the fired clay, sketched in with slip-fired black, the bowl’s painter added white pigment to the image of the sculpted body of Herakles. Yellow lines sketch in the modeling on top of the white...
paint. The painter in the scene is depicted applying material colors to the lionskin draped over the sculpture’s right shoulder. The colors that this painter is shown painting are in fact rendered in the fired red terracotta and black lines. On the body of the statue, traces of the underlying fired terracotta show through the white paint, highlighting one of the most acute problems in ancient Mediterranean color, its comparative impermanence. Here, in an inversion of what takes place on marble sculpture when polychrome pigments wear off to leave the white surface, the resilient red of the underlying fired terracotta peeks through the added white representing marble.

The composition shows Herakles watching his own image undergoing completion, a state realized through the application of colors. This image is the visual analog to the conservative Roman natural historian Pliny the Elder’s claim that the Greek painter Nikias painted sculptures by the Greek sculptor Praxiteles: “It is this Nikias, of whom Praxiteles said when asked which among his sculptural works he most preferred, ‘the one to which Nicias has laid his hand’; so great was his esteem for [Nikias]” (NH 35.133).113 The practice of painting sculpture required no defense or justification; indeed, Praxiteles would have considered his work incomplete or flawed without the addition of pigments and surface treatments. Praxiteles and Nikias coproduce the statue, which is made up of material color – marble and pigments. The scene on this Herakles bowl shows both the kind of collaboration between painter and sculptor described in Pliny and also the addition of material colors to a statue in process. Recognizing this collaboration undermines the lone genius biographical system of art history, even as it is this same biographical tradition that gives us the two names of both collaborators.114

This description of a collaboration between a sculptor and a painter highlights not only the quotidian fact that sculptures were painted, but also the manner in which sculptural and painterly practices fitted forms together.115 The nineteenth-century debates about polychromy and a long-standing preference among scholars for a light touch with color than to some truth to etymology. On restrained color, see Vinzenz Brinkman, Gods in Color (Munich: Stiftung Archäologie, 2007), 21. On the straightforwardness of painted sculpture implied by this anecdote, see Duigan, “Colour and the Deceptive Gift,” 78, citing Stewart, Greek Sculpture, 41.

113 J. J. Pollitt, The Art of Greece: Sources and Documents (Cambridge: Cambridge University Press, 1990), 170. The word circumlitio, -onis (f) is unusual, with few known occurrences. It occurs twice in Pliny’s Natural History (24.40 and here at 35.133). The OLD offers two definitions: 1. “anointing round about,” for which it cites NH 24.40 and 2. “coating or covering (with paint or similar substance),” for which it cites NH 35.133 as well as Sen. Ep. 86.6. The TLL also cites the two passages from Pliny and the one from Seneca but considers circumlitio to be more of a technical term for painting. In a commentary on Pliny’s art historical texts, Eugénie Sellers Strong argues that circumlitio refers specifically to highlighting the hair, lips, and accessories, like a technical term for the type of restrained polychromy that John Gibson applied to his Tinted Venus. Eugénie Sellers Strong, The Elder Pliny’s Chapters on the History of Art, 2nd ed. (Chicago: Ares Publishers, 1976), 158. This definition owes more to the


constitutive role of material color in producing forms transforms the hierarchy of form over color. For painting, we accept colors as an expected and necessary material tool, but rarely as the intellectual basis of the practice. Instead, we treat the forms made up from marks of pigments – the shapes of painting or drawing – as a material proxy for the mental image or form (eidos). Sculpture, on the other hand, can be constructed “without” color by rejecting surface pigments and reducing the variegation of its marble to a singular and symbolic white form. This has elevated white marble as a base material while also devaluing sculpture produced in materials like limestone and terracotta on which more extant ancient pigments remain visible.

Non-marble sculptures were understood to need these added pigments because of their inferior material substructure. In order to preserve this hierarchy of material production, marble had to be kept free of additive colors.

By studying different artistic media separately, we miss the kind of transmedial work that material color does, as well as the collaborative practices that additive color in particular demands. Ancient Greek painting has primarily been studied through secondary visual citations in other artistic media or verbal descriptions of famous paintings in later texts. After decades of focus on sculpture, recent scholarship has returned to painting, bringing together new archaeological discoveries and conservation science with older but dormant examples, such as the wooden panel paintings from Ano Pitsa, to which we will turn to Chapter 2. This reinvigoration of the study of ancient Mediterranean painting, however, continues to treat it as a practice distinct from that of making and painting sculpture. Material color, especially additive color, moves across and connects different media, undermining conventional boundaries and making visible a set of intersecting artistic practices and artistic collaborations.

While potters and painters registered their co-production of the signed surfaces of ceramic vessels, scholars have often also treated the

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117 On singular white and purity, see Batchelor, Chromophobia, 13.

118 Given the importance of painting within the hierarchy of media, several major studies have gathered the extant evidence of painting on surfaces other than vases, but also depend on examples from painted ceramics to fill in the corpus of lost panel paintings. Each study gathers examples from the wider Mediterranean under the umbrella of Greek or Graeco-Roman panel painting and isolates the colors of painting from the colors of other media. “Classical painting other than that which appears on vases must be one of the strangest and least tractable of all the manifold artistic genres bequeathed to us by antiquity,” wrote Andrew Stewart, “Review of Plato and Greek Painting by Eva C. Keuls,” The Art Bulletin 65, no. 4 (1980): 648–650. On Greek painting beyond vases, see Vincent J. Bruno, Form and Color in Greek Painting (New York: W. W. Norton, 1977); Eva C. Keuls, Plato and Greek Painting (Leiden: Brill, 1978); Agnés Rouveret, Histoire et imaginaire de la peinture ancienne: ve Siècle Av. J.C.-Ier Siècle Ap. J.C. (Rome: Ecole française de Rome, 1989); Hariclia Brecoulaki, La Peinture funéraire de Macédoine: emplois et fonctions de la couleur IVe-Ier Siècle Av. J.-C. (Athens: Centre de recherches de l’antiquité grecque et romaine, Fondation nationale de la recherche scientifique, 2006). In recent years ongoing finds from excavations at Macedonian sites continue to increase examples of preserved painting, although the bracketing of Hellenistic art allows these examples to stand outside of narratives central to the reception history and mainland Greece of the sixth to fourth centuries BCE.

ceramic painters as proxies for panel painters whose names are recorded in Greek and Roman literature, but whose works are not extant. Collaborations between potters and painters produced polychrome ceramic vessels just as collaborations between sculptors and painters produced polychrome sculptures. For its representational effects, the painter who crafted this Herakles scene drew on the practices of painters working across other media as well as the relationships between collaborating artists. We might understand these material objects as assemblages, and the collaborative practices that produce them as a kind of social assemblage.

MATERIAL CONNECTIONS

The use of material colors, like the ancient Greek language of materials, connected the ancient Mediterranean to linguistic and artistic practices across Egypt, Mesopotamia, and the Near East, building up what one might call a material color koinē (common language) across regions, politics, and artistic practices. Excising color from classical art crafts a story of exceptionalism that the reconstitution of material color undercut. Rather than showing Greek and Roman art to be radically different from the art produced by cultures in its contact zones, material colors forge connections across these different cultures, particularly with Egypt and the ancient Near East. These contact zones have long been acknowledged as sources of influence on ancient Greek forms, but the excision of color from Greek art made it seem as though Greek artists had moved in a very different direction, especially in the art and architecture produced in the fifth and fourth centuries BCE leading up to and during the Athenian democracy. In a passage that scholars often cite as a factual account of color practices in ancient Greece, rather than conservative Roman nostalgia for a Greek past that never existed, Pliny the Elder, in his Natural History (35.50), wrote about the restrained color palette used by Greek painters working in the fifth century BCE:

It was with four colours only that Apelles, Echion, Melanthius, and Nicomachus, those most illustrious painters, executed their immortal works; mелиnum for the white, Attic sil for the yellow, Pontic sinopis for the red, and atramentum for the black, and yet a single picture of theirs has sold before now for the treasures of whole cities. But at the present day, when purple is employed for colouring walls even, and when India sends to us the slime of her rivers, and the corrupt blood of her dragons and her elephants, there is no such thing as a picture of high quality produced.

Pliny looked back to earlier Greek painters said to have worked with colors sourced from the Attic earth (white, yellow, red, black) and grouped these through the label “four-colour palette.” In Pliny’s wake, scholars dutifully sought examples of this restrained palette from the limited extant material record of fifth-century BCE Greece. The material record does not

122 See Pliny NH 35.50. Ingeborg Scheibler, “Die ‘Vier Farben’ der Griechischen Malerei,” Antike Kunst 17 (1974): 92–102. Marion True, “Introduction and Overview of the Conference,” in Tiverios and Tsiiaphakē, Color in Ancient Greece, xiii. For an analysis for how the “four-color palette” was received in later periods, see James, Light and Colour in Byzantine Art,
confirm the regular use of this highly restrictive palette, despite efforts to fit material evidence into it. The four-color formula likely draws on the earlier four elements from which philosophers such as Empedocles described the fitting together of the forms of the visible world.

Pliny’s focus, however, is not actually the ancient Greek painter, but the expansive palette of the Roman artist during the empire. He connects material colors with geographic locations, so that the palette maps connections. Pliny’s reference to the corrupt blood of dragons and elephants, for example, gives rise to the naming convention for the red pigment known as dragon’s blood (Dracaena cinnabaris) produced from the resin of the subtropical Socotra tree that grows in the Socotra archipelago in the northwest Indian Ocean (Figures 21 to 22). In order to praise the local footprint of the fifth- and fourth-century BCE Greek painters he is elevating, Pliny constructs a limited, indigenous palette for these artists. In contrast, he emphasizes that Roman painters use a wider range of material colors sourced from more places so that their palettes include the physical traces of distant geographies, bodily fluids from fantastic creatures, and the base world of matter. Although here Pliny is discussing painters, not sculptors, the later ideological extension of the limited palette that Pliny constructs is the idealized whiteness of ancient Greek art in contrast to the polychrome materials of art produced by other cultures. The visibility of color on the art of other cultures has fueled a commitment to erasing color from ancient Mediterranean art in the service of a genealogy of Western exceptionalism. Material colors were sourced locally and traded widely so that the use of colors mapped wider social relations through material connections. Reconstituting material colors, especially additive color, brings ancient Greek artistic practice into alignment with practices across the wider Mediterranean, the ancient Near East, and Egypt, affirming connections rather than essentializing difference.

The earlier example of kuanos and lapis lazuli tracks this kind of transcultural and translinguistic connection. The term kuanos in Greek encompasses the many affordances of lapis lazuli: blue hue, micaceous variegation and sparkle, and high economic value (Figures 23 and 24). Introduced by the anthropologist John J. Gibson in 1975 in the context of ecology and perception, the word “affordance” captures the qualities of an object or environment as well as experiences of that object or environment by beholders. Gibson writes, “color and shape are oversimplified qualities, for texture merges with color and yet it is a kind of shape at the level of the small-scale layout.” Although he uses


123 On pigments in Roman art, see especially Hilary Becker, Commerce in Color: The Mechanics of the Roman Pigment Trade (forthcoming).


125 On the construction of the idea of Western civilization, see Kwame Anthony Appiah, “There Is No Such Thing as Western Civilization,” The Guardian, November 9, 2016.


127 Ibid., 97.
Figure 21 An old dragon tree (*Dracaena draco*) with a gash in its stem releasing its "dragon's blood" resin and a door in its trunk. Aquatint with etching by R. G. Reeve after J. J. Williams, ca. 1819. Wellcome Collection, London
different language, in his engagement with colors and soil changes in the environment, Gibson briefly touches on spatiality of material color and its integration of surface and depth. Thinking about the term *kuanos* in terms of its affordances captures both characteristics that the term describes as well as the sensory experiences of *kuanos* in the world. *Kuanos* seems to encompass not only objects formed from the stone (as in the textual construction of the inlay on the shield of Achilles), but also bodies imbued with the *krôma* or *khrôs* of lapis lazuli, and additive pigments that were produced either from the ground-up stone (later called ultramarine), or from the ubiquitous pigment Egyptian blue. Similar objects of and words for lapis lazuli appear across the wider Mediterranean, Egypt, Mesopotamia, and the ancient Near East. Excavating this period color language in the ancient Mediterranean reveals material

connections across wider contact cultures, connections that the whitewashing of ancient Greek and Roman art and text covered up.

Sumerian, Akkadian, and Greek texts all deploy the word for lapis lazuli (Sum., za-gin, Akk. uqnā, Gr. kuanos) at times to mean the material itself (e.g. this object or palace was formed from the stone lapis lazuli) and at other times to mean possessing the deep blue of lapis lazuli or shining or shimmering in the manner of the stone lapis lazuli.¹²⁹ Lapis lazuli accrued high

value not only from its blue hue, but also from its bright shimmer, what would be called its lamprotēs in ancient Greek. A line from the Sumerian epic *Enmerkar and the Lord of Aratta* captures this when Enmerkar implores the goddess Inana to “let them cut the pure lapis lazuli from the lumps, the brightness of pure lapis lazuli” (39) and later describes the “bright mountain of lapis lazuli.” In addition to numerous textual references to lapis lazuli in Sumerian, Akkadian, and ancient Greek texts, the material record documents extensive use of the stone.

Lapis lazuli is found primarily in the Badakhshan region of modern Afghanistan. From as early as the seventh millennium BCE, it was exported throughout the Indus valley, Mesopotamia, and Egypt. The dark blue stone is composed of multiple minerals and often


flecked with shimmering metallic pyrites. It held significant monetary, social, and affective value. Its closest modern equivalent, suggests Roger Moorey, would be the status accorded to diamonds. Objects, sculpture, tablets and inlay, portable seals, beads, and charms made with lapis lazuli have been found throughout excavations in the ancient Near East, especially in tomb contexts and in raw form as foundation deposits. A cache of cylinder seals from Thebes (Boeotia) included many formed from lapis lazuli, where the color and value of the stone were among the reasons for their pride of place within the hoard. Stashes of the unworked stone were buried with elite persons, used as offerings to deities, and buried along boundary lines. The highest-quality stones were often kept in treasuries, changing hands only through elite gift exchange, as war booty, or as tribute.

Although the stone circulated widely, evidence for lapis lazuli ground into ultramarine, a pigment prized for its deep, vibrant color and the difficulty and expense of its production, is rare before the sixth and seventh centuries CE. Artists regularly used Egyptian blue instead to produce a deep lapis lazuli-like blue hue. The substitution of synthetic for earthborn pigment exchanged the process of producing color for the process of extracting and grinding the stone without significant loss of status in that transition. After the third millennium, sources for lapis lazuli seem to have grown scarcer and fewer objects crafted from the stone appear in second- and first-millennium contexts. Egyptian blue gained popularity as a means of giving objects the blue-black hue associated with lapis lazuli “from the mountain.” A discussion of lapis lazuli “from the kiln” emerges in the textual record in the middle of the second millennium BCE as do references to lapis lazuli adjusted by boiling and lapis lazuli mixed with glass. This suggests a certain amount of preoccupation with the possibility of substituting something human-made and artificial for a natural resource, a tension that runs through the history of color, but is not always considered negative.

In the material record of the ancient Near East, hair and beards are among the objects that could be either sculpted from lapis lazuli or painted blue. Among the earliest examples are the so-called lyres buried in the Royal Cemetery at Ur (2650–2500 BCE) (Figures 25 and 26).

136 Ibid., 177.
141 Feldman, Diplomacy by Design, 117.
142 Ibid.
144 Indeed, turquoise, which enjoyed esteem almost on par with that accorded lapis lazuli in the fourth millennium BCE, fell increasingly out of favor, in part because of the ease with which it could be counterfeited, and because of its potential for losing its color when oiled. Ibid., 179.
Although often reconstructed and pictured fitted onto a modern wooden body (the ancient wood does not survive), these images show two pieces of the lyre, the head and the panel of inlay, as separate pieces that would have been attached to the wood. The lyres were buried along with many portable objects and the site yielded numerous objects formed from lapis lazuli. The body of each lyre is a dazzling object of assembled color, crafted from wood that has been inlaid with various precious material colors, such as ivory, gold, carnelian, and lapis lazuli. A bull’s head of gold, silver, and lapis lazuli tops the wooden body. The head of one such object consists of a gold sheet with openings for attached hair, beard, ears, horns, and eyes. A sheet of gold hammered over a wooden core formed the base of each horn, with attached lapis lazuli tips. The eyes were assembled from lapis lazuli for the lid and iris and shell for the white of the eye. Each eye was then fitted into the opening in the gold head and attached with copper wire. Over seventy tesserae of lapis lazuli carved into curls were attached to the head core using bitumen. Additional tesserae of lapis lazuli were carved into beard locks and arranged into a pattern of longer and shorter pieces. The beard pieces were attached to the head using copper alloy wire and backed with silver. The form and color of both hair and beards are crafted from pieces of lapis lazuli.

Building on this tradition, but with additive pigments, artists working in the Persian Empire during the first millennium often used Egyptian blue pigment to paint beards and hair. On the tomb of Artaxerxes III above the terrace at Persepolis, for example, excavators found Egyptian blue pigment on the hair and beards of Persian soldiers. Excavators also found many fragments of painted blue beards among many other vibrant colors throughout the site. In addition, archaeologists excavated ceramic pigment bowls at various locations throughout

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Figure 25  Bull's head and attachment, ca. 2550–2400 BCE, wood, lapis lazuli, gold, silver, bitumen, shell, from Ur, PG 789, King's Grave, U.10556, L: 40 cm x W: 25 cm x H: 19 cm. University of Pennsylvania, Museum of Archaeology and Anthropology, Philadelphia
Figure 26 Inlaid front panel, ca. 2550–2400 BCE, shell and bitumen, from Ur, PG 789, King’s Grave, U.10556, L: 31.5 cm x W: 11 cm x D: 1.5 cm. University of Pennsylvania, Museum of Archaeology and Anthropology, Philadelphia.
Persepolis, including bowls containing green, red, and blue pigments deposited along the Apadana, perhaps dedicated by the painters themselves.150 Antiquarian travelers and early archaeologists also observed evidence of painting, painted sculpture, gilding and silvering, at Susa and the Tomb of Darius I at Naqsh-e Rustam.151 The combined evidence suggests that painters, sculptors, gilders, and other artists worked together at Achaemenid sites to produce vibrant assemblages of color.152 These examples from Mesopotamia align with the artistic practices of additive and assembled colors in the Greek-speaking world.153

**MEDITERRANEAN EXEMPLA**

Examples of additive color on sculpture produced in a range of media across the ancient Mediterranean affirm the transmedial work of material color. Like the artists working at Persepolis, ancient Greek artists also used Egyptian blue as an additive color on sculpture for beards and hair that might be described textually as *kuanos*. Examples include the painted limestone “Bluebeard” sculpture from the Athenian Acropolis, a painted terracotta head of Hades from a sanctuary to Persephone and Demeter at Morgantina, and a painted terracotta acroterion of Zeus and Ganymede from Olympia. These examples of blue beards not only intersect with the Greek textual tradition, but also connect to the ancient Near Eastern artistic and textual examples, as the next section will explore. In each sculpture, additive colors remain visible to the naked eye and artists layered these pigments onto each sculpted material support. Just as artists pieced together many different pieces of lapis lazuli and other materials to form the lyres from Ur through assemblage, so did artists working with blue pigments piece together the substructure and pigments to form these blue beards through additive color.

**Bluebeard(s)**

A trio of hybrid serpentine creatures sculpted from limestone and covered with a layer of stucco and then layers of colorful pigments comprise part of the pedimental sculptures from the Archaic temple, or “Hekatompedon”, on the Acropolis (ca. 560 BCE) in a scene that also included the figure of Herakles wrestling a sea-creature. This polychrome sculpture group has been restored and installed as a centerpiece of the Acropolis Museum, Athens, where blues, greens, blacks, browns, and reds remain visible (Figures 27 and 28).154 In addition, the Metropolitan Museum of

152 Ibid., 596–600.
154 A number of colors remain visible on the statue group exhibited in the Acropolis Museum, Athens. In addition, an early-twentieth century watercolor first published by Theodor Weigand, *Die Archaische Poros Architektur der Akropolis zu Athen* (Kassel: T. G. Fisher & Co., 1904) has long circulated a facsimile of these colors to wider audiences although the medium of watercolor, reproduction technologies of that watercolor, and the deterioration of the sculpture’s colors already underway by the early twentieth century all muted these colors. See Brinkmann, *Bunte Götter*, 26, fig. 23a–b. The most frequently reproduced nineteenth-century watercolors of antiquities were produced by the family Gilliéron, who was the subject of a recent exhibition at the Metropolitan Museum of Art, New York: *Historic Images of the Greek Bronze Age*, May 17, 2011–June 17, 2012. Most recently on Gilliéron, see Joan R. Mertens and Lisa Conte, “Watercolors of the Acropolis: Émile Gilliéron in Athens,” *The Metropolitan Museum of Art Bulletin* 76, no. 4 (Spring 2019): 5–46. Other limestone and Hymettian marble architectural fragments painted with pigments and some attached with lead pins likely belong to the same structure: cornice (limestone with green, yellow, red pigments, Acr. 4572), Doric capital (Acr. 20790), East pediment (red, green pigments, Acr. 4, 37, 40), horses (Hymettian marble with black and other pigments, Acr. 575), Medusa acroterion (Hymettian marble, Acr. 701), owl (limestone with black, white, red

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Art, New York, has recently published watercolors of these pedimental sculptures produced in the early twentieth century and sold to the museum by the Gilliérons, father-son painters of archaeological objects. The watercolors offer a new look at how the extant colors were recorded in 1919 (Figure 29).156 A significant amount of the original material colors remain visible on the objects themselves, including the blue of their namesake beards.156 The label in the Acropolis Museum describes these figures as “alive with color,” a turn of phrase that emphasizes the animation enacted by material color.

Three blue-haired heads and beards are shown in three-quarter view and three overlapping torsos display their reddish-brown painted flesh and well-muscled arms. Their eyebrows have been painted brown and their eyes deeply incised and black-lined, framed by incised lash-lines, with the pupils punched and painted black. Each figure’s head gazes out at a slightly different angle, covering a wide swath among them. The different angles of each head offer a sequential narrative. In returning the gaze of each figure, a beholder must mimic the statue’s rotation or animation.157

The blue color of the figures’ hair and beards operates relationally, as pigment (actual material), as lapis lazuli (the material referent), and as the Greek color-word kuanos. The surface of the sculpted hair and beards, though painted with a three-dimensional layer of Egyptian blue pigment, evokes hair sculpted from blue material or lapis lazuli.158 Pigment performs a number of functions here, as its ‘true’ material state (inexpensive components of Egyptian blue), as a simulacrum of sculpted lapis lazuli (the high-value and high-status stone), and as a representation of blue beards, replete with divine associations. The image oscillates between different states: kuanos, pigment, beard, body.159

HADES

A terracotta head from the second half of the fourth century BCE, returned to the site of Morgantina on Sicily from the J. Paul Getty Museum, Los Angeles, offers another example of additive color used to produce a blue beard (Figures 30 and 31). The head was sculpted of terracotta, fired, and painted. Hand-shaped curls that match this head in material, color, style, and size, were found among other terracotta fragments at the Thesmophorion sanctuary in Morgantina, site of the cult of Demeter.160 On the basis of this evidence the head has been repatriated and identified as depicting Hades, Zeus’s brother and ruler of the underworld. This head belonged to a sculpture that stood next to one of Persephone, Demeter’s daughter, whom Hades abducted. A short material description of the object in the online catalog reads:

155 Ibid, 30 on a repainted cast of the Bluebeard group.
157 Each figure holds an attribute – a bird, water, and possibly a sheaf of wheat, respectively. These distinct attributes are not present in paintings published by Wiegand in 1904, cited in Brinkmann et al., Bunte Götter, 26. Compare with Mertens and Conte, “Watercolors of the Acropolis,” 22–29, who point to the difference across several watercolors and prints in recording the attributes.
159 On oscillation, see discussion in Neer, Style and Politics in Athenian Vase-Painting, 65.
160 Maria Lucia Ferruzza, Ancient Terracottas from South Italy and Sicily in the J. Paul Getty Museum (Los Angeles: J. Paul Getty Museum, 2016), no. 60.
Figure 27 Installation view of three entwined snake-bodied figures from the West pediment of Archaic Temple to Athena, or "Hekatompedon," Acropolis, Athens, ca. 570 BCE, limestone with stucco, applied pigments, lead, H: 0.76 x W: 3.23 m, Acropolis Museum, Athens, Acr. 3. @ Acropolis Museum. Photo: Sokratis Mavrommatis

Figure 28 Installation view of three entwined snake-bodied figures from the West pediment of Archaic Temple to Athena, or "Hekatompedon," Acropolis, Athens, ca. 570 BCE, limestone with stucco, applied pigments, lead, H: 0.76 x W: 3.23 m, Acropolis Museum, Athens, Acr. 3. @ Acropolis Museum. Photo: Sokratis Mavrommatis
Pinkish in color (Munsell 5 7/4); in the back, the clay is a lighter hue (5 8/2), with a friable, porous consistency. The surface is coated with a layer of greenish diluted clay and a layer of whitish slip (calcite?). Polychromy: light blue (beard), pink (neck, face, lips), and reddish brown (curls of hair). The added pigments would have been applied after the firing process.161

Unlike the Acropolis Bluebeards, the hair of Hades was painted red, while the beard was painted blue. A painter covered the thick curly hair, locks of which were worked separately and then attached, with a reddish-brown hematite.

Called the bloodstone, hematite (Gr. haima-tites) derives from the ancient Greek word haima (blood).162 One of the most common minerals on the earth’s surface, iron oxide (Fe₂O₃), has been used as a pigment from at least as early as the paleolithic period and is found in various places, including recent traces of hematite found on Mars.163 As a solid, hematite takes many varied hues and can be carved for glyptic arts, but its mineral trace produces a shade of red (Figure 32).164 The use of hematite pigment for the hair of this statue contrasts dramatically with the Egyptian blue pigment used on its beard (Figure 33).

While this pairing of hematite for the hair and Egyptian blue for the beard is anomalous, a well-known fresco from the Tomb of Persephone at Vergina depicts Hades with flaming hair and beard, abducting Persephone in a chariot (Figure 34). The pigments used on this and other spectacular tomb paintings from Macedonia have been extensively analyzed by Hariclia Brecoulaki.165 The wall paintings, the painted tomb architecture, and the painted and inlaid grave goods preserve both additive and assembled colors, as Brecoulaki’s in-depth analysis demonstrates.166 The Vergina tomb paintings emphasize Hades’s reign over the underworld and Persephone’s imprisonment therein, as well as the impact of their marriage on the colors on

161 Ibid.; Panzanelli, Color of Life, 136–137, no. 20; Claire Lyons, Michael J. Bennett, and Clemente Marconi, Sicily: Art and Invention Between Greece and Rome (Los Angeles: J. Paul Getty Museum, 2013), 53, 192, fig. 133.
165 Brecoulaki, La peinture funéraire de Macédoine, 77–99, and for the materials of individual pigments, 157.
166 Ibid., 49–97.
the surface of the earth. Produced under the Macedonian monarchy, the vibrant colors of this painted tomb architecture, wall frescos, and polychrome objects placed in the tombs were first excavated in the 1970s and analyzed by Brecoulaki in the early 2000s (published in two volumes in 2006). These many colors both captured preserved rare examples of free painting and also remained sidelined from larger

conversations about color in and on ancient Mediterranean art, likely because of persistent Winckelmannian narratives of Hellenistic art’s decline and decadence.

The myth of Persephone’s abduction by Hades and her mother, Demeter’s response, also describes the changing colors of the natural world. While her daughter is trapped in the underworld, Demeter refuses to allow plants or flowers to grow and her refusal forces Persephone’s partial return to earth in a myth that explains changes in the seasons through

![Figure 31 Head of Hades, profile, Terracotta with pigments, 400–300 BCE, H: 26.7 cm x W: 20.4 cm. Museo regionale di Aidone, Morgantina, Sicily](image-url)
Persephone’s proximity to her mother.168 When Persephone is trapped with Hades in the underworld, it is winter; when she is above ground, the earth experiences the riot of material color associated with growing things.169 She moves between surface and depth, bringing colors to the earth’s surface, dictating the growing seasons and the possibilities of pigments derived from plants. Her movement tracks the sort of connection between surface and depth that additive color always negotiates. Both Hades and Persephone from Morgantina are formed from earthborn terracotta and pigments, even as they narrate the story of colors returning to and retreating from the earth’s surface.

The ancient painter added Egyptian blue for Hades’s beard and mustache. It was on the basis of the head’s thick blue beard and the divine associations with kuanos that curators initially labeled this object the “head of a god, probably Zeus.”170 In light of its archaeological context, this identification has changed and the pairing of hematite and Egyptian blue for Hades takes on a different divine resonance. Pigment layers form the divine beard, rendering it kuanos.

168 On the possibility of feminist refusal, Bonnie Honig writes: “A women’s refusal is rendered unimaginable but it nonetheless haunts the very present that denies its possibility. It may even seed a future,” Bonnie Honig, A Feminist Theory of Refusal (Cambridge, MA: Harvard University Press, 2021), 5.


170 This was the exhibition text associated with this head prior to its identification as Hades.
Zeus and Ganymede

Vibrantly painted terracotta sculptures found at Olympia and currently on display in the archaeological museum at the site include part of a statue of a naked male warrior with a painted chlamys, a head of Athena crowned with a painted garland and wearing disc earrings, and a statue of Zeus abducting the boy Ganymede (Figures 35 to 38). Extant white, black, and red pigments remain visible on the Athena fragment as do white, red, blue, black, brown pigments on the warrior fragment and brown, red, and blue-black pigments on the Zeus and Ganymede pair.

171 On the head of Athena and fragments that might be associated with it, see Alika Moustaka, *Grossplastik aus Ton in Olympia* (Berlin: de Gruyter, 1993), 10–45; on the warrior 46–47; on the Zeus and Ganymede pair 42–45, and analysis of additional painted terracotta fragments. Assembled from parts discovered at different times between 1878–1941, see Moustaka, *Grossplastik aus Ton in Olympia* (Berlin: de Gruyter, 1993), 42, pl. 36 and 38, with bibliography. For the narrative of Zeus and Ganymede, see Hom. *Hymn to Aphrodite* 200–216; II. 5.265–279, 20.231–235, and Pindar *Ol. 1*, esp. 44–45. The story of Ganymede is a popular myth, first appearing in the *Iliad* (5.265) and common in visual representations dating from the first half of the fifth century, with a hiatus in the latter half of the fifth century, to a resurgence in the mid-fourth century BCE that stretched into a curious embrace by Christianity in the Middle Ages, and then steadfast popularity in the Renaissance and beyond. See James N. Davidson, *The Greeks and Greek Love: A Bold New Exploration of the Ancient World* (New York: Random House, 2007), 184. On the absence of all manner of abduction scenes in the visual arts of the second half of the fifth century BCE, see Stewart, *Greek Sculpture*, 84–85; For a careful description of the additive colors on the statue group see ibid., 147.
on the Zeus and Ganymede pair. All of these were excavated from fill layers but would have stood on the site in the fifth century BCE. The head of Zeus was found in a fill layer near the stadium in 1878, the base in 1938, the remaining pieces of the statue to which it fits in 1939, and the head of Ganymede was discovered in 1940. Zeus’s hair and full beard are painted the rich blue-black described in Greek texts as kuanos. His eyebrows, lashes, and irises are painted the same blue-black color, while his pupils are slightly darker. His flesh is painted deep reddish-brown,

Figure 34 Painting of Hades abducting Persephone, North wall of tomb at Vergina, pigments in fresco technique, Tomb I ("Tomb of Persephone"), c. 350 BC, Museum of Royal Tombs of Aigai. The rights to the depicted monument belong to the Ministry of Culture and Sports. Grave I (Tomb of Persephone) falls under the jurisdiction of the Ephorate of Antiquities of Imathia, Ministry of Culture and Sports - Organization for the Management and Development of Cultural Resources. © Hellenic Ministry of Culture and Sports/Hellenic Organization of Cultural Resources Development. Photo: Courtesy Hariclia Brécoulaki.

172 On Athena’s colors see Moustaka, *Grossplastik aus Ton in Olympia*, 20; on the warrior’s colors see, Moustaka, *Grossplastik aus Ton in Olympia*, 34.

173 Blegen, *New Items from Athens*, 478–479. Scientific analysis of the pigments has not yet been published, leaving the specific materials of the colors unidentified.
and he wears a darker red garment painted to look as if it has been embroidered with repeated images of Pegasus along its border. In his left hand, Zeus carries a staff. Under his right arm he carries the boy Ganymede, whose own bare flesh carries the slightly lighter tones of an ephēbe (but not the pale pigment associated with female flesh). Ganymede’s hair and eyes are reddish-brown and he carries a rooster painted red, presumably a gift from Zeus, in his left hand.

The site of Olympia evokes most readily its marble pediments depicting the chariot race of Pelops (east) and centaurs abducting Lapiths (west); the (lost) chryselephantine cult statue of Zeus, designed, like the Athena Parthenos in Athens, by Pheidias and identified as one of the seven wonders of the ancient world; or the Olympic Games hosted from eighth century BCE to the fourth century CE. But the site itself was richly variegated, housing bronze and
Figure 35 Zeus with Ganymede, terracotta with pigments, ca. 470 BCE, H: 1.10 m, Archaeological Museum, Olympia. © Archaeological Museum of Olympia-Hellenic Ministry of Culture and Sports, Ephorate of Antiquities of Ilia – Archaeological Receipts Fund. Photo by author.
Figure 36 Zeus with Ganymede (back view), terracotta with pigments, ca. 470 BCE, H: 1.10 m, Archaeological Museum, Olympia. © Archaeological Museum of Olympia-Hellenic Ministry of Culture and Sports, Ephorate of Antiquities of Ilia – Archaeological Receipts Fund. Photo by author.
Figure 37  Zeus with Ganymede (detail of heads and torsos), terracotta with pigments, ca. 470 BCE, H: 1.10 m, Archaeological Museum, Olympia. © Archaeological Museum of Olympia-Hellenic Ministry of Culture and Sports, Ephorate of Antiquities of Ilia – Archaeological Receipts Fund. Photo by author.

Figure 38  Zeus with Ganymede (detail of legs and base, with hem of repeating pegasi), terracotta with pigments, ca. 470 BCE, H: 1.10 m, Archaeological Museum, Olympia. © Archaeological Museum of Olympia-Hellenic Ministry of Culture and Sports, Ephorate of Antiquities of Ilia – Archaeological Receipts Fund. Photo by author.
terracotta workshops, as well as Pheidas’s studio and objects and buildings produced in a range of materials. For example, the architect Libon designed the structure of the temple of Zeus from local Elean limestone as well as marble from Paros and Penteli (Figure 39). Builders pieced together the structure from these three different materials – local limestone for the body, marble quarried on the island of Paros for the pedimental sculptures, and marble from the Pentele quarries in Attica for the rooftiles. The white stucco that once covered the limestone has traditionally been described as an addition to imitate marble and to create the false impression of a unified, monochrome white exterior. That stucco, however, served as part of the fitted-together polychrome surface of the building’s khrōs and as the ground for added pigments, just as stucco is used as a ground for additive colors in other examples in this chapter.

Zeus’ divinity shines forth from within his body through his painted hair and eyes. Color in this context does not merely qualify the hair, beard, and eyes, but makes these features into the hair, beard, and eyes of Zeus. The beholder witnesses the shining color on the surface of the figure, produced through the application of pigment and a buffing agent, yet the figure appears to generate this shimmer from within. Color unifies surface and substrate by producing the effect of power and animation generated in the body itself and manifested on and through its surface.

Zeus without kuanos is simply another man offering love gifts to a boy. Kuanos reveals Zeus’s divinity to his audience, while simultaneously reinforcing the narrative that the image depicts. As the Homeric Hymn to Aphrodite narrates: “Wise Zeus seized Ganymede for his blond (xanthōn) beauty. Now he lives among the immortal gods and pours wine for them in Zeus’ house – amazing, a man honored by all the immortals, drawing the red nectar (nectar eruthron) from a gold mixing bowl.” Zeus abducts Ganymede to keep him on Mount Olympus to serve the gods the red (eruthros) nectar that keeps him and the other gods kuanos.

Color choices on the sculptural group emphasize Ganymede’s mortality in contrast to Zeus’s immortality. Ganymede’s hair is the more


176 On absence and presence in Greek sculpture, see Neer, The Emergence of the Classical Style in Greek Sculpture, 28.

177 Rayor, The Homeric Hymns, 81–82.

178 Hom. Hymn to Aphrodite 207. Although contemporary notions of consent were not active in the ancient Mediterranean, especially with respect to the gods and others in power, the consistent gloss of abduction obscures the subsequent rapes that the abduction precedes and our sanitizing reception of this tradition normalizes this violence. On this, see Diane J. Rayor, The Homeric Hymns (Berkeley: University of California Press, 2014), 10–11; Ella Gonzalez and Cynthia Coburn, “How to Teach Ancient Art in the Age of #metoo,” Hyperallergic, September 5, 2018; Rebecca Levitan, “A ‘Rape’ by Any Other Name: Against teaching Abductions in Ancient Art,” Journal of the History of Ideas Blog, May 6, 2019, https://jhiblog.org/2019/05/06/a-rape-by-any-other-name-against-teaching-abductions-in-greek-art-2.

179 Davidson, The Greeks and Greek Love, 170–200, has argued that the popularity of Ganymede’s story derives primarily from his role serving red nectar to the gods,
common light reddish-brown. In some accounts and depictions, as in a red-figure bell krater now in the Louvre, he is depicted as xanthos (yellow-orange-haired), as described in the Homeric Hymn which further emphasizes his lack of kuanos (Figure 40). The different hair colors and skin tones used on the Zeus and Ganymede sculpture mark, in much the same way as their different sizes, their distinct ages, and statues.

Here again, color as khrōs does not mimetically represent the flesh of the boy Ganymede or the unseeable god Zeus, but it marks out distinctions between bodies in codified ways.

In addition to the Zeus and Ganymede statue, archaeologists found fragments of other terracotta statues, indicating that the site once teemed with many different materials and colors. Artists painted a statue of a warrior with white, red, yellow, and black pigments (Figures 41 to 43), and a head of Athena with black eyes, brows and hair, red lips, and disc earrings and a painted flower-crown of the sort Sappho’s poetry invites us to picture. Excavated in the late nineteenth and early twentieth centuries, these material colors have been visible since the statue’s discovery and reassembly but once again, the terracotta base material has meant that these additive

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180 Musée du Louvre, Paris, G175; Hom. Hymn to Aphrodite 202. In both the statue from Olympia and on the krater now in the Louvre, Ganymede’s hair is painted a lighter shade than Zeus’s hair and full beard to mark his difference from the god.

colors did not alter dominant art historical narratives of unpainted, monochrome, marble sculpture. The Bluebeards have also been known since the nineteenth century. And yet all this khroma has not shifted the emphasis on form and iconography in teaching and studying sculpture. Despite the additive colors of their surfaces, these sculptures have not countered the story of white monochrome forms, because of their non-marble substrates. Ongoing scientific research, however, continues to demonstrate repeatedly that marble sculpture was also painted, even in the most canonical spaces, such as the Parthenon. In addition, both the Bluebeards and the Zeus and Ganymede are from sites that have been central to the story of the whiteness of the ancient Mediterranean – Athens and Olympia. The material colors of the Bluebeards could be bracketed not only because of their limestone material support, but also because they predate the fifth-century Acropolis buildings, so the whiteness of the short-lived Greek democracy

Figure 40 Berlin painter, Attic red-figure bell krater depicting Zeus and Ganymede, Side B. Ganymede, 490–480 BCE, Fired terracotta with yellow-orange pigment, H: 33.7 cm; D: 39 cm, Louvre Museum, Paris, Inv. G175 © RMN-Grand Palais / Art Resource, NY. Photo: Stephane Marechalle
Figure 41 Male figure (front view), early fifth century BCE, Terracotta with pigments, H: 1.05 m, Archaeological Museum of Olympia. © Archaeological Museum of Olympia-Hellenic Ministry of Culture and Sports, Ephorate of Antiquities of Ilia – Archaeological Receipts Fund. Photo by author
Figure 42 Male figure (back view), early fifth century BCE, Terracotta with pigments, H: 1.05 m, Archaeological Museum of Olympia. © Archaeological Museum of Olympia-Hellenic Ministry of Culture and Sports, Ephorate of Antiquities of Ilia – Archaeological Receipts Fund. Photo by author
Figure 43 Male figure (detail, back of legs), early fifth century BCE, Terracotta with pigments, H: 1.05 m, Archaeological Museum of Olympia. © Archaeological Museum of Olympia-Hellenic Ministry of Culture and Sports, Ephorate of Antiquities of Ilia – Archaeological Receipts Fund. Photo by author
could be held up against the vibrant colors of earlier aristocratic control. At Olympia, the many pigments that remain on the terracotta statues suggest that the iconic marble pediment sculptures would also have been painted. The local Elean limestone of the temple itself (in comparison to the Parian marble of the sculptures) is regularly noted as an assertion of local political presence, so that even without taking into account the building’s additive pigments and metal attachments, its different materials fitted together to form a substructure with variegated colors. Attention to different materials and color-parts makes visible a vibrant world of material colors.

When we trace the story of material colors, both of substrates and surfaces, we find endless variegation (*poikilia*), even in the most canonical spaces. The Bluebeards, Hades, and the Zeus and Ganymede pair each demonstrate the widespread practice of adding material colors to the surface of statues. The additive colors joined with the material colors of the substructure to form each object, building surfaces and joining together material color-parts to form polychrome assemblages.