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Editor

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THE GEORGE WASHINGTON
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Color, Expectations, and Authenticity in Oriental Carpets: The Case of the Anhalt Carpet in The Metropolitan Museum of Art

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Abstract | Far from being straight forward, the variable of color in the art of the Islamic carpet over the centuries is fraught with complexity. Scholarly expectations of color in the various historical eras and geographic groups of carpets are shaped by what has survived of old traditions—and scholars may react in negative ways when such expectations are contradicted. But what has survived is a small percentage of what originally existed. Colors in the corpus of classical carpets have often been modified due to exposure to light; wear; chemical action among dyes, mordants, and fiber; and later repairs and alterations, in addition to the natural color variations stemming from spinning and dyeing technology. In scholarship, skewed expectations of carpet color have led, in several important cases, to assigning certain works or groups of works to the category of reproductions or even forgeries. More complicated still is the nature of textiles' reactivity to light. This is especially relevant for pile fabrics, pile carpets and velvets in particular, which means that color intensity and value may be almost impossible to define precisely, depending as they do on the strength and type of lighting, angle of view, the angle of illumination, and the angle of pile structure. This fact imposes extra burdens on attempts at scholarly objectivity and accuracy, especially in the case of determining an accurate assessment of color in Islamic carpets, assessing artistic quality, making accurate attributions of date and geography, and taking and publishing photographs of carpets. We can illuminate all of these aspects of the role of color in scholarship in a particular case, which revolves around the authenticity of the “Anhalt” carpet in The Metropolitan Museum of Art collections.

Over two decades ago, the bridge crossing the Connecticut River between the western Massachusetts towns of Sunderland and Deerfield was extensively remodeled, and its steel guard railings on either side were painted a bright hue of blue. Public reaction was immediate and intense, with angry letters to the newspaper, urgent contacting of politicians, and noisy honking of horns, all expressing displeasure with the railings, which according to the critics, should have been painted a more appropriate green. More recently, the reconstructed picket fence delineating the new Emily Dickinson Museum in Amherst, Massachusetts, after meticulous historical research, was painted its original hue of beige, again prompting expressions of public opinion, including denunciations of “replicating bad nineteenth-century taste.” Why does color elicit such strong reactions from so many of us? Why, despite the maxim *de gustibus non est disputandum*, do

so many individuals equate particular hues with what they believe to be good or appropriate taste? Why do we expect to see certain colors in certain places and artistic or environmental situations? And why do these questions have far-reaching consequences for the study of textiles? These questions form the focus of the present paper, which looks particularly at a group of problems surrounding color in the artistic medium of the knotted-pile carpet.

In the second half of the twentieth century some major questions about authenticity formed a part of research and scholarly discourse in the area of carpet studies. One concerned the so-called Salting carpets, a group of carpets named after an eponymous example in the Victoria and Albert Museum donated by George Salting in 1910 (fig. 1). Carpets in this group have survived in very good condition; they exhibit Persianate design, rendered in a wide range of very

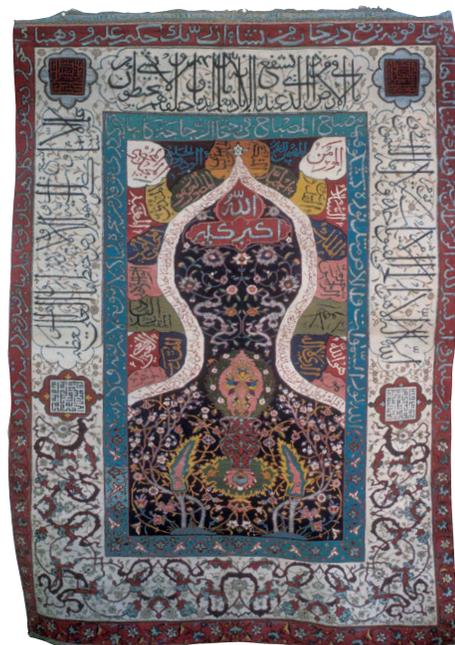


FIG. 1
Salting Carpet, Iran, possibly Qazwin, 1560–1580. Wool pile on silk warp and weft, areas brocaded with metal thread, approximately 231 × 165 cm (100 × 65 in). Victoria and Albert Museum T.402-1910, bequeathed by George Salting. Photograph courtesy of Victoria and Albert Museum, London.

FIG. 2
Prayer rug, Iran, second half of 16th century; approximately 170 × 116 cm (67 × 46 in). Topkapi Palace Museum, Istanbul, inv. 13/2009.

intense hues.¹ The great German scholar of oriental carpets Kurt Erdmann, in what in retrospect must be deemed a judgment of unprecedented audacity, proposed as early as 1941 that the Salting group of carpets, which are dispersed in many of the world's major museums, including a group of prayer rugs in Istanbul's Topkapi Palace Museum (fig. 2), and long considered to be creations of sixteenth-century Safavid court manufactories in Iran, were "Persian carpets of Turkish provenance."² Because the condition of many of these carpets was very good and the hues of these carpets were, to Erdmann's eye, variegated and intense to the point of being garish, Erdmann sought an explanation for what he took to be anomalies in condition and color by assigning the entire group to an unknown and unspecified nineteenth-century

Turkish place of manufacture. Such was Erdmann's influence on other carpet scholars of the time, especially May Hamilton Beattie (England), Charles Grant Ellis (United States), and Friedrich Spuhler (Germany), that within a short time most museums had changed their records and their labels to reflect Erdmann's radical hypothesis.³ Carpet scholarship at the time was simply unwilling to recognize good condition, and the bright colors associated with it, as consonant with great antiquity. Significantly, however, none of the three scholars cited above published their reasons for supporting Erdmann's claim, so the entire matter became an established truth virtually without the benefit of any open scholarly discourse, except in catalogue entries of exhibitions and collections published by the three scholars.⁴

¹ See Eiland and Pinner 1999 for a full discussion of the history and development of the "Salting" controversy. The article by John Mills in Eiland and Pinner (1999, pp. 1–17) lists all the known carpets of the Salting group. The Topkapi prayer rugs are illustrated and discussed in Tezcan 1987, and in a wider context, far more exhaustively in an article by Michael Franses in Eiland and Pinner (1999, pp. 36–111).

² Erdmann's first suspicions about the Salting and Istanbul carpets, primarily based on his adverse views regarding their color, appeared in 1941 in a complex and lengthy review of "The Art of Carpet Making" chapter in Arthur Upham Pope's massive *Survey of Persian Art* (1939) (Erdman 1941); the passage relevant to the Salting question appears, together with Pope's rejoinder, in Eiland and Pinner 1999, pp. 18–24. Erdmann's rationale for an Anatolian (Hereke) provenance is found in Erdmann 1970, pp. 76–80. Subsequent detailed research on Hereke, in which nothing was found to substantiate Erdmann's hypothesis (Erdmann died in Berlin in 1964) was published in 1987 in both Turkish and English editions by Önder Küçükerman (Küçükerman 1987). Küçükerman's book also postdates Beattie's work on Hereke (Beattie 1981) but predates, by a year, Ellis's Philadelphia Museum of Art catalogue (Ellis 1988) with its discussion of the Marquand carpet (Ellis 1988, pp. 110–5) included in the book's section on Turkish carpets, giving the carpet a nineteenth-century date.

³ Most museums have now revised, once again, their date and provenance labels to reflect the new scholarship determining the Persian and sixteenth-century origins of these carpets; the Ellis-inspired label on the Marquand carpet on exhibition in Philadelphia was finally changed in 2017.

⁴ Most notably Ellis 1988, catalogue entry 37 (Marquand medallion carpet); and Beattie 1982 (Thyssen-Bornemisza Collection) entry XV (the von Pannwitz medallion and animal carpet).



FIG. 3
The Anhalt Carpet, Iran, first half of 16th century. Wool pile on cotton warp and silk weft, approximately 793 x 420 cm (26 x 13¾ ft). The Metropolitan Museum of Art 46.128, gift of Samuel H. Kress Foundation, 1946. Photography courtesy of The Metropolitan Museum of Art.

In the early 1970s, a similar judgment was passed on the celebrated "Anhalt" carpet in The Metropolitan Museum of Art collections (fig. 3). Originally thought to have belonged to a branch of a German noble family, the carpet was given in 1946 by the Samuel H. Kress Foundation to The Metropolitan Museum of Art and was counted among the museum's great masterpieces.⁵ Dr. Beattie worried that with its minor pile wear and its bright, unfaded colors, it could not with confidence be determined to be an early sixteenth-century Persian product.⁶ Charles Grant Ellis was disturbed by the carpet's overall intense yellow ground color, not found in any other major Persian carpet known to him, and found this anomaly to be uncharacteristic of classical Persian carpets.⁷ Dr. Spuhler, in addition to joining in with these doubts about condition and color, also found elements of the design and drawing in the carpet to be of what he described as inferior quality, and supported the notion that it was a late copy.⁸ None of the three scholars was able to suggest a place or an atelier where a carpet of this size and complexity might have been woven in nineteenth-century Iran, or Turkey for that matter. All communicated their opinions quietly to the museum, which discreetly (and prudently, given the status of the three scholars) removed the carpet from display without any open scholarly discussion.

It is not the purpose of the present paper to restate in great detail all of the arguments on both sides of the authenticity questions mentioned in the previous two paragraphs. The latest carpet scholarship, drawing on a wide range of historical, visual, and scientific analysis, has determined both

⁵ A pre-1985 bibliography on the Anhalt carpet may be found in Beattie 1985. Among the more recent publications, the most important is the short entry on the carpet in Ekhtiar 2011, pp. 257–8.

⁶ May Hamilton Beattie's ambivalence about the authenticity of the Anhalt carpet is reflected in the fact she undertook two exhaustive technical examinations of the carpet at different times in The Metropolitan Museum of Art (one dated 1973 and the other apparently earlier). I am indebted to Jon Thompson and Francesca Leoni at the Ashmolean Museum, Oxford, for providing me with copies of Beattie's notes and other more recent documentary material. It is important to note that before her death in 1997, Beattie, in a short article in *Encyclopaedia Iranica* (Beattie 1985) changed her mind about the Anhalt carpet and accepted its authenticity. See also <http://www.iranicaonline.org/articles/anhalt-carpet-a-medallion-rug-possibly-made-in-tabriz>.

⁷ Ellis's suspicions of the yellow color, communicated verbally to the author of this article and to others on numerous occasions, formed the core of his disbelief in the authenticity of the carpet. But as far as The Metropolitan Museum of Art's records show, he apparently never communicated his suspicions in writing to the museum.

⁸ Friedrich Spuhler in 1973 sent The Metropolitan Museum of Art a typewritten summary, in German, of his doubts about the carpet. Apart from condition and color, Spuhler focused on details of the carpet's design. Since that time, Spuhler's purported design anomalies, which he claimed would never have been countenanced by Safavid designers, have been shown to exist in virtually all Safavid carpets, with the notable, and ironic, exception of the Salting group.

the Salting carpets and the Anhalt carpet to be completely authentic Safavid Persian works of the sixteenth century.⁹ In the years since the original hypotheses casting doubt on their authenticity were put forward, we have discovered a significant number of indisputably early carpets that have survived in very good condition and display unexpectedly unfaded, fresh, and intense colors. We understand more fully the chemistry of color, the fading properties of light, and the different ways in which colors change, or do not change, over time. In fact, in a broader sense, we have undergone in the discipline of the history of art a veritable revolution in the way we look at color, in large part through the efforts of art conservators.

In the area of painting, for example, the cleaning of layers of darkened varnish from Rembrandt's enormous group portrait once dubbed the "Night Watch" literally turned night into day; the vast conservation work on the Sistine Chapel ceiling radically altered our conception of Michelangelo as a painter. The rather startling polychromy we know to have been used on Classical era Greek statuary not only makes us uncomfortable today, but its implications for evaluating statuary of the Neoclassical movement of the nineteenth century provoked a massive case of art historical heartburn. And in all of these cases, the change in perception of color has been accompanied by controversy, based in significant part on expectations of color conditioned by years, indeed centuries, of viewing and visual consensus. It is this question of how expectations about color in art are formed and then defined, and the problems that occur when a defined and established expectation is denied, that constitute a major focus of this paper.



FIG. 4
The Anhalt carpet: detail of pile area showing patchy wear, corroded brown, and re-knotting.

In the two matters under discussion, discoveries about the technical aspects of the Salting carpets have been made public in a 1999 special volume of *Oriental Carpet and Textile Studies*.¹⁰ Intensive study of the Anhalt carpet undertaken by the Department of Textile Conservation of The Metropolitan Museum of Art after 2008 was very illuminating. Despite the outward appearance of good condition, the carpet has suffered from the patchy wear and peripheral erosion usually encountered in very old carpets (fig. 4). Corrosion induced by the use of an iron mordant has resulted in the disappearance over time of most of the original fine black-brown dyed wool pile, that was replaced hastily and ineptly, probably by a dealer, with very coarse red-brown wool yarn sometime in the twentieth century (fig. 5). Careful comparison of knot count in symmetrically comparable motifs to the left and right of the central vertical axis of the carpet has established that a cartoon or full-scale drawing was the basis of weaving, and not the knot plan often used in nineteenth-century products of Iran (fig. 6).

⁹ Despite having been taken off view in 1974, the carpet was included as a loan in the important exhibition *The Eastern Carpet in the Western World* in London in 1983 and was published in its catalog (see King and Sylvester 1983), where the authors affirmed their belief that it was authentic. In a review of that catalogue published in 1984 (Denny 1984) the reviewer challenged the three scholars—Ellis, Beattie, and Spuhler—to publish their reasons for doubting the authenticity of the carpet, and further challenged The Metropolitan Museum of Art to undertake scientific analysis of the dyestuffs, especially the "anomalous" yellow color. Neither challenge was taken up until The Metropolitan Museum of Art undertook extensive dye analysis of the carpet in 2008. The carpet returned to public display on the central platform of the museum's new Safavid and Qajar gallery on May 21, 2012, as the centerpiece of the second carpet rotation in the gallery.

¹⁰ See Eiland and Pinner 1999; the studies published here are today deemed to have conclusively established that the Salting carpets and the vast majority of the Topkapı-type prayer rugs are Iranian in manufacture and sixteenth century in date. As an indication of evolving scholarship, Spuhler (Spuhler 1998), in a more recent catalog of Islamic carpets and textiles in the Thyssen-Bornemisza collection, has published the von Pannwitz carpet, which strangely enough, Erdmann never included in the Salting group, but Beattie (Beattie 1972) had listed as "19th century Turkish," as a great masterpiece of sixteenth-century Safavid weaving.



FIG. 5
The Anhalt carpet: detail showing re-napping of corroded brown area.



FIG. 6
The Anhalt carpet: left-right comparison.

And precise chemical analysis undertaken by The Metropolitan Museum of Art in 2008 of dyestuffs used in the carpet confirmed the presence of traditional dyes in the Anhalt carpet, including blues, reds, and the predominating yellow color from larkspur. All of this technical analysis confirmed an analysis of samples from the carpet made in a British laboratory back in the early 1970s, the results of which strangely seem not to have reached The Metropolitan Museum of Art until early in 2008.¹¹

In the area of art in general, and that of textiles including carpets in particular, expectations about design, color, and indeed all artistic aspects, are formed through a historical consensus developed through a long evolutionary period of overview of a more or less unchanging body of familiar data, which has somehow survived over the centuries. In order to determine the appropriateness of the expectations, first we need to look at the body of data on which these expectations are based, and more specifically at the overall question, most important in textiles, of the probability of survival of this data over time.

Experts who have spent a career familiarizing themselves with the entire surviving oeuvre of an artist, or the entire body of works in a particular medium from a particular time or place, may take justifiable pride in their accomplishment and expertise and in

the way in which visual mastery of a group of artworks can be used to determine authorship, geographical origin, or use of a work of art. Despite misguided efforts in the second half of the twentieth century to relegate connoisseurship to practical irrelevance and to the domain of corrupt dealers, plutocrat collectors, and cynical museums, informed connoisseurship and the educated eye remain the central bedrock of art history research, without which the rich repertoire of approaches, methods, and analytical tools used by art historians is of limited usefulness.

But just as the arsenal of physical and chemical tests available to art historians and archaeologists, or the array of newly discovered documentary sources and archives, must be used with caution and full appreciation of their defects and shortcomings as well as their benefits, so connoisseurship needs to avoid two essential pitfalls: over-reaching hubris and over-reaching hypotheses. A close look at the rate of survival of works of art, especially in the realm of carpets and textiles, many of which were expressly made with the original intention of living a brief but glorious life of display before being worn out and discarded, should lead us to the sobering conclusion that what remains of early carpets for us to study is probably only a tiny fraction of what originally was made. Vast knowledge of the frequently obscure

¹¹ In a report to the department of Islamic art by conservation scientist Nobuko Shibayama dated September 1, 2008, the colors of the Anhalt carpet were determined to employ traditional dyestuffs commonly used in the sixteenth century, including lac for the reds and larkspur for the yellow ground color. In 2008, another report—previously unknown at the museum and with no indication of its intended recipient—made by scientists M. Whiting and T. Sugiura and dated January 22, 1975 came to light. A copy of this report, provided by the Beattie Archive, finally reached The Metropolitan Museum of Art in February 2008. The two scientists who signed the report apparently analyzed samples taken from the Anhalt carpet that appear to have been provided by Dr. Beattie—it is unclear whether this occurred with or without The Metropolitan Museum of Art's knowledge. In the report, Whiting and Sugiura determined that all samples were consonant with early Persian carpet weaving and concluded "...we consider that this piece should be regarded as genuine until strong evidence against it comes to light."

and often unpublished surviving carpets—an uncanny ability acquired with great effort—by Ellis, Beattie, and Spuhler, does not of course automatically imply an equally vast knowledge of the much larger number of examples that have not survived to our time. As such, it can be, and proved to be in several instances, a hindrance as well as an asset in scholarship.

And to complicate matters, we have to remember that it was probably never the intent of carpet weavers that their works should last for centuries; their available technical processes were developed and used accordingly. Sixteenth-century Anatolian or Iranian weavers probably had little idea that the iron mordants used to create the dark-brown yarns employed for outlining in their pile-woven products would mean that, over centuries and with abrasive wear from use underfoot, the dark-brown pile knots would become brittle and either wear prematurely or even disappear altogether. We are not accustomed to seeing early carpets with brown outlining, and the aesthetic judgments we exercise on carpet color and design are often based on surviving examples without this important aesthetic feature.

The seventeenth-century Iranian weavers who created the brightly colored, glitzy silk-pile and silver-wrapped silk thread carpets we today sometimes call “Polonaise” carpets, were likewise probably unaware that with the passage of time the brilliant hues that constituted the major aesthetic impact of their products were going to fade to beiges, ochres, and browns, or that the silver would tarnish and then corrode and disappear.¹² In the same vein, those masterful restorers working in the employ of art dealers, who around 1900 diligently reweave the missing pile in damaged and fragmentary ancient carpets—that is, most ancient carpets—probably

never imagined that, due to the use of untested modern synthetic dyes, their carefully matched rewoven pile colors would over time fade dramatically, and end up pointing out the ravages of time even more blatantly than the gaping holes and raggedy edges and ends that they were supposed to ameliorate (fig. 7).¹³ As a consequence of all of this, when carpets survive in good condition with minimum pile corrosion and with their original colors relatively unfaded by light—such as the “Doria” Polonaise carpet in the Tehran Carpet Museum or the Ballard quatrefoil Ushak carpet in the Saint Louis Art Museum—it is hard to treat such exceptional survivals in the context of an aesthetic norm historically based on faded and worn examples.¹⁴

For historians of textiles in particular, the “Salting” and “Anhalt” incidents are a dramatic reminder of two complications that hubris frequently causes us to overlook. First, surviving textiles often give us only a vague and possibly distorted idea of what

FIG. 7
Ballard carpet, photographed in 1935 (left) and 2015 (right), Ushak, mid-17th century, wool, knotted pile, approximately 176 × 93 cm (69¼ × 36½ in). Saint Louis Art Museum 105. 1929, gift of James F. Ballard.



¹² The “Polonaise” group of carpets and the disappearance of color in most examples has been extensively discussed and published. See especially the early opinions of Arthur Upham Pope in Pope 1938, pp. 2388–401 and the fundamental work of Spuhler (Spuhler 1968). A brief but definitive summation by Jon Thompson (Thompson 2006, pp. 197–201) is highly useful.

¹³ Dramatic evidence of the fading of color in restorations made around 1900 may easily be seen by comparing two catalogue illustrations. Plate XXV in Dimand 1935 depicts an Anatolian carpet (105.1929) in the James F. Ballard collection in the Saint Louis Art Museum, presumably as photographed around the time of publication. By the time of the 2016 Ballard exhibition in St. Louis, the colors of this carpet had changed so dramatically for the worse that it was excluded from the exhibition; a small illustration may be seen in Denny 2016, p. 218.

¹⁴ The so-called Doria Polonaise carpet in question, with excellent colors (one of a pair, with a less colorful counterpart 50.190.5 in The Metropolitan Museum of Art), 410 × 180 cm, is now in the Carpet Museum, Tehran; the Ballard Ushak carpet, although fragmentary, has survived in a condition not encountered in any other early Ushak carpet; it is discussed in Denny 2016, pp. 90–1.

there once was, and the older an example appears to be, the more likely that its color is not original, and the less certainty exists as to what is genuine, what is an anomaly, and what is a forgery. As experts, art historians, including textile specialists, are expected to be definitive and precise. It is rare to encounter the words “probably” or “possibly” before an uncertain date, an imprecise tribal group, or a problematic area of geographic origin in a scholarly catalog. And all too often, the temptation arises to coin or misuse terms—one thinks of “Transylvanian,” “Wallachian,” “Imreli,” “Karapınar,” or the ever-popular “Indo-Persian”—to give the appearance of precision where none exists.¹⁵

A second complication is the lack of precision—the abundance of subjectivity—in color terminology, along with the major limitations of even the best color photography and printing technology today (more about this below). In published scholarly catalogue entries, even with a color photograph printed along with each entry, scholars frequently list colors in a carpet. This is because the intended range of colors in a carpet—those determined to have been chosen by the designer and dyer—and the apparent range of colors in a carpet—those resulting from repairs, from varying exposure to light over time, and from *abrash* or color variations stemming from the inevitable variations of time and temperature found in pre-modern dyeing technology—are often at odds, sometimes very dramatically, with one another. But in listing intended colors, the terms we use for the various hues, values, and intensities of color found in pile carpets are far from absolute and precise, despite efforts to reduce subjectivity.¹⁶

In the case of pile carpets, there is one central, unavoidable reason for our inability to be precise about color: the colors themselves are intrinsically imprecise. The colors of most carpets change either in intensity or in value depending on the angle and color of illumination, the angle of viewing, and the position of both light source and viewer with regard to the natural slant of the wool pile. This variation is amplified in the case of silk pile. While not reaching the positive and negative extremes of monochrome silk damask—where the texture of the woven surface causes variations in its reflectivity, and thus, depending on the viewing and illumination angles, in the viewer’s perception of dark and light values of an identical hue—the surface of any carpet with a modicum of intact pile exhibits variations in both value and intensity of hue. This depends on whether we look at it lengthwise from the top—the knotted pile always slants primarily toward the bottom of the carpet, where the weaving in a horizontal series of rows of knots began—or according to where the light on the carpet originates. In sum, we cannot be precise about carpet color in large part because color precision does not exist. In fact, this imprecision is one of the most distinctive and attractive aspects of pile carpets as an art form, along with the color variations (*abrash*) resulting from the imprecise nature of traditional dyeing processes. Incidentally, the same may be said for carpet dimensions, especially in large carpets, in which length and width vary, sometimes significantly, according to humidity, temperature, and how long and under what circumstances the carpet has been hanging for exhibition, and in which orientation. Printed carpet dimensions should be preceded by the adjective “approximately.”

¹⁵ “Transylvanian” carpets are carpets woven in western Anatolia, of a particular technical and design group, that were found in large numbers in churches in southern Hungary and northern Romania. The name, used to define an Anatolian technical and design group, was subsequently thought by some to indicate the place of weaving. This error was compounded by Ellis (Ellis 1988, pp. 92–104) when he used the term “Wallachia” as an indication of place of weaving of this group of carpets in the Philadelphia Museum of Art catalogue. Wallachia is the geographic name of the fertile Danube plain of south Romania, and according to exhaustive research by Romanian scholars was never a place of carpet weaving. For recent clarification see both Sakıp Sabancı Museum 2007 and Ionescu 2007. “Imreli” (also referred to as Eymur) mysteriously appeared as a tribal name attached to a group of Turkmen carpets in a 1980 exhibition (Mackie and Thompson 1980, pp. 135–44). “Karapınar” has morphed from a suggested and hypothetical place of origin of a specific group of central Anatolian carpets, first proposed by Beattie, into a standardized provenance of a much larger group of carpets (see Oakley 2010).

¹⁶ Many decades ago, Alfred di Credico, a painter and professor at the Rhode Island School of Design, who was also a carpet collector and exhibit curator, tried to use close comparisons between carpet color and standard artists’ oil paints to describe carpet colors. However, terms such as “cerulean blue” and “burnt umber” from the painter’s palette, let alone the exotic names of colors found in the larger boxes of Crayolas we may have encountered as children, have not made their way as standard terminology into the literature of carpet description.

Lack of precision in determining intensity and value of hues in carpets is not the only problem. Perceptions of hues themselves vary according to their context with regard to adjoining or surrounding hues. In a paper delivered in late June 2019 at a symposium organized in London to celebrate the publication of the 200th volume of *HALI*, Dr. Jon Thompson further underlined the ambiguity of color as an artistic element both for carpets and in more general terms. We perceive color, he noted, not as an absolute, but according to how any particular value or intensity of a hue relates to nearby colors in the same work of art, or to the wall colors in an exhibition gallery, or to surrounding colors—or brilliant white—in publications. This has been noted in reviews of recent attempts to use computer-originated colors to fill in backgrounds, holes, and missing parts of fragmentary carpets in some recent publications.¹⁷

An additional color factor pertaining to virtually all works of art exhibited in museums, but especially pertinent to carpets, is the color of museum lighting. Decades of museum exhibition standards, first under tungsten light (around 3200 degrees Kelvin), then with halogen lighting (usually around the same), have accustomed museum goers to seeing works of art with far warmer colors than they actually exhibit in daylight (5600 degrees Kelvin). Using a rheostat to lower the voltage, and hence the light output of tungsten bulbs, has the side effect of further lowering the color temperature as well, and since reduced lighting is the norm for carpets and textiles (as well as works of art on paper) these works have been traditionally exhibited under lighting with a pronounced orange cast. While state-of-the-art LED museum lighting today allows for higher color temperature, prejudices of museum visitors and curators alike has meant that many institutions have stayed with the familiar 3200 degrees Kelvin, to avoid complaints that works of art

seen in the daylight in which they were created look “too harsh” or “too blue.”

A further problem related to carpet colors depicted in photography and publishing is the way that, in the controlled conditions of the photography studio, carpets themselves often confuse even the most state-of-the-art metering available to photographers. Go to any museum website and you will often discover images, created by the finest museum photographic departments in the world, that are at least two orders of magnitude—two f-stops—too dark when compared to viewing the actual carpet.¹⁸ The reason appears to be that the pile surface of carpets somehow misleads even highly sophisticated metering.¹⁹

In seeking accurate portrayals of color in digital and printed images, both on the monitor screen and on paper, museums and auction houses are using a new method of photographing very large carpets by employing a very high-resolution digital camera attached to a computer and a laser-guided gantry. This apparatus allows the taking of multiple photographs, using identical lighting and camera settings, of a carpet displayed flat on the floor. These are subsequently stitched together into a massive single computer image. The technology shows a good deal of promise as long as the final version is created with a degree of brightness comparable to the actual viewing of the carpet. Ultimately the new technology mitigates the Herculean task faced by film photographers of carpets such as the late Otto Nelson, who had to create perfectly even lighting and faithful color rendering—with all of its attendant problems of lighting angle, pile angle, and camera viewpoint—on large transparencies, and then extensively and often subjectively manipulate printing from the resulting color separations.²⁰ But even the most carefully rendered coloration and uniform lighting we see in the very best and most meticulous

¹⁷ A good case in point is the layout of Ölçer and Denny 1999. In designing the book, computer-generated reds were used to fill in the missing parts of carpets; this led to a good deal of criticism by reviewers about how the liberal use of red ink skewed the perceptions of other colors in the carpets that were illustrated.

¹⁸ For example, The Metropolitan Museum of Art's online collection: <https://www.metmuseum.org/art/collection/search/450716>.

¹⁹ A useful exercise is to compare colors in printed images in Denny 2014, most of which are drawn from the collection of The Metropolitan Museum of Art, to the website images of the same carpets. The Metropolitan Museum of Art's photographic services are among the best in the world, but the baffling problem of too-dark photographs of pile carpets is a widespread phenomenon, and frequently results in muddy colors and too-dark printed images as well.

²⁰ Nelson's superb color photography and excellent control of printing may be seen in McMullan 1966.

publication of carpet images is not something we would normally ever be able to see in a viewing of the carpet itself. For this reason, the old maxim that an art historian should never publish, especially in color, or pass judgment on any work of art that she has not been able to view in actuality “in the wool,” is still valid, as the maxim that one does not buy carpets at auction based on photographs on gallery websites or published catalogues. In sum: “you trust your mother, but you still cut the cards.”

Of course, with all of these cautions noted, art historians, and textile scholars in particular, still have to deal with ancient objects and fragments that have often undergone dramatic color changes in addition to other injuries to their physical, and thus aesthetic, integrity.

There are new technical means that scholarship can use to attempt to contend with this sort of problem. In a recent exhibition at the Harvard Art Museums, for example, conservators and conservation scientists used digital technology to “revive” the colors on Rothko murals created in the 1960s that have now almost completely faded away, as have the colors on Ektachrome transparency film made at the time the murals were first unveiled.²¹ Widely dispersed fragments of an important Mamluk carpet and an equally important Mughal carpet depicting fantastical animals, to mention but two examples, have, by computer, been reunited to give us an idea of their original context.²² The digital reconstituting of original colors of faded textiles is now a relatively easy matter to accomplish on a computer; the popularity of Adobe Photoshop software has put the power to reinterpret color, and almost everything else, in works of art in the hands of anyone who wants and learns to use it. So along with the benefits of using computer-generated photographic restoration, reassembly, and reuniting of works of art, comes a host of potential ethical

problems. Should every scholarly color publication perhaps include a warning about color veracity comparable to the warnings about undercooked meat in restaurant menus?

In the end, however, color subjectivity, which itself is almost always formed by the expectations based not on the ephemeral factor of “what there was,” but the much smaller and inevitably more definable category of “what there is,” will continue to form an inevitable part of the scholarly judgments of historians of art in general, and historians of textiles in particular. To cope with it, the best solution is to recognize that it is always there, and then to avoid both the hubris of absolute certainty, and the lure of over-reaching hypotheses in a vain attempt to impose a high degree of certainty on the vast, omnipresent, and inevitable unknown.

²¹ “Mark Rothko’s Harvard Murals” was shown in the Special Exhibitions Gallery of the Harvard Art Museums from November 16, 2014 to July 26, 2015. The exhibition addressed the conservation issues and technological resources surrounding an attempt to digitally restore faded colors in murals painted by Rothko in the 1960s in a Harvard University building; it also dealt with the use of contemporary Ektachrome transparency films (themselves faded) as a means of ascertaining the original appearance of these murals. See <https://harvardartmuseums.org/visit/exhibitions/4768/mark-rothkos-harvard-murals>.

²² For a reconstruction of the Mughal grotesque animal carpet, see Walker 1997, pp. 33–7. For a reconstruction of the “Bardini” Mamluk carpet with blazons, see Mack 2017, pp. 70–91.

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Multiple-niche prayer carpet
(*saḥ*), Deccan, India, late 18th
century (detail). The Textile
Museum R63.00.15, acquired
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