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The Hidden Revolution of Colored Grounds: An Introduction

Maartje Stols-Witlox, Elmer Kolfin

This essay introduces the topic of this special issue: how the use of colored grounds influenced the production and visual qualities of seventeenth-century Netherlandish painting. The adoption of colored grounds in the Netherlands coincides with marked stylistic developments toward an emphasis on tonality and chiaroscuro. It culminates in, for example, the work of Rubens and Rembrandt and also makes possible a unique way of landscape painting. This important but understudied topic is addressed from complementary angles, providing insight into larger developments, the roles of the various actors of artistic production, and the role of colored grounds within artistic oeuvres. In addition, this special issue nuances—and at times refutes—existing theories on the routes by which colored grounds reached the Netherlands. Finally, it attends to the various methods of inquiry that support research into the nature and meaning of colored grounds for art historical investigation.

1. Between 1580 and 1620, Netherlandish art underwent significant changes.[1] The most fundamental development was the rise of the open market for paintings.[2] It resulted in enormous growth in the number of artists and paintings and an entirely new social dynamic in the world of art. It also led to the rise of specializations, generating a collective iconography that was totally new, even if rooted in sixteenth-century traditions.[3] Another innovation was the taste for paintings with scenes and scenery that looked more real than ever before. Finally, artists experimented with new techniques of painting in oil, both in order to supply the market as efficiently as possible and to cater to the taste for the new realism. All of these developments were closely connected.

2. The present issue focuses on a development that has remained somewhat hidden from view: the rise of the colored ground. A ground is a uniform layer or layers that were applied to prepare the painter's panel or canvas to receive the paint layers; it is thus literally covered with paint. Nonetheless, the ground has a strong impact on the tonality of a painting.

3. Across Europe, the preferred color of grounds changed over the course of the sixteenth century. Colored grounds gained popularity, and white-toned supports became less common. This development correlates with revolutionary changes in painting techniques and styles. The colored ground stimulated tonal harmony, which supported the new taste for realism that relied on tonal unity and soft contours instead of color contrast and sharp-edged lines. Painters started using more open and therefore more efficient brushwork, which was also appreciated as a new expression of virtuosity. By transitioning from white to colored grounds, seventeenth-century Netherlandish artists adopted a method that facilitated the new economic painting styles and benefited the new paradigm of realism. Colored grounds became ubiquitous in Netherlandish art by the second quarter of seventeenth-century. In an often-cited article, John Michael Montias has pointed out that the new market situation demanded process and product innovations that significantly changed the production and appearance of Dutch art.[4] As a socioeconomic art historian, he paid less attention to the actual artistic technicalities that figuratively and literally underlie

the processes that he described, including the innovation of painting on colored ground—but he was aware of their importance and encouraged their study.[5]

4. In a sense, the present issue is an answer to this call. Its aim is to remedy the scholarly invisibility of the ground in Netherlandish seventeenth-century paintings, to provide new insights, to add more nuance to existing theories concerning the adoption of colored ground, and to generate a better understanding of the importance of its color for the visual qualities of these paintings.

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5. The present issue is the synthesizing study of a research project that was sponsored by the Dutch National Research Council (NWO) that ran between 2019 and 2024, titled *Down to the Ground: A Historical, Visual and Scientific Analysis of Coloured Grounds in Netherlands Paintings, 1550–1650*.[6] It is one of three major outcomes of this research project; the others are a PhD dissertation by Moorea Hall-Aquitania, titled "Common Grounds: The Introduction, Spread, and Popularity of Coloured Grounds in the Netherlands 1500–1650," and an open-access database that Hall-Aquitania developed in collaboration with Paul J. C. van Laar.[7] The database records colored grounds in Netherlandish painting between 1500 and 1650, with heavy emphasis on Dutch art from 1580 to 1650.[8] The aim of the project was to write an interdisciplinary history of colored grounds, establishing how they spread to the Netherlands in the sixteenth century and what influenced their introduction. Initially, the central point of reference on the processes and mechanisms leading to the general adoption of colored grounds was a 1979 study by Hessel Miedema and Bert Meijer.[9] Due to an absence of focused research into the spread of colored grounds, Miedema and Meijer's hypothesis that colored grounds traveled from Italy to the Netherlands stood unchallenged for forty years after its publication. Thanks to the growing body of technical information on sixteenth- and seventeenth-century painting, it is now possible to paint a more nuanced picture of this development, which appears to have been more complex than believed.

6. As a second aim, the *Down to the Ground* project explored how colored grounds coincided with changed painters' practices in the seventeenth century and developed a deeper understanding of the impact of colored grounds on the visual qualities of paintings at the time of their making and after centuries of aging. The authors of the eight studies in this issue (excluding this introduction) on the spread of colored grounds and technical practices related to their use are all connected to the *Down to the Ground* project—as team members, museum partners, or participants in various convenings. Here, they illustrate from different angles how colored grounds revolutionized the appearance of seventeenth-century Netherlandish paintings and how artists used them. We believe that an awareness about this will deepen appreciation for the ingenuity and innovative spirit of seventeenth-century Netherlandish painters and will feed new research into artistic production in the Netherlands. The aim of this introductory essay is to explain what exactly constitutes a colored ground, to articulate the role of the ground in Netherlandish seventeenth-century painting, and to present art historical ideas about its sixteenth-century proto-history.

The Colored Ground: An Example

7. Just exactly what is a colored ground, and what can it do? A comparison between a painting with a landscape and figures attributed to Jan van Eyck (before 1390 –1441) and his workshop painted on a white ground, and one by Jan van Goyen (1596–1656) on a toned surface, serves to demonstrate the differences in buildup and pictorial effect.[10] *The Three Marys at the Tomb* is characterized by enamel-like, luminous tones with clearly defined color areas **(fig. 1)**. In Jan van Goyen's *View of Leiden from the North-East*, overall color harmony and tonality are prioritized (**fig. 2**). The difference literally emerges from the different grounds the artists worked on. Painting on a white surface, the Van Eycks completely covered the panel with multiple translucent paint layers, as seen in a reconstruction of this painting by Indra Kneepkens (**see figs. 14–18**). This way of building up each area with different layers resulted in the deep green and vibrant red of the saints' robes but also in distinct boundaries between the different areas of color. In contrast, Jan van Goyen worked on a brown base tone, the combined effect of a thin, light brown ground and the brown color and grain of the panel that shines through.[11] This was a conscious decision; he carefully exploited the light brown surface as a midtone throughout the painting, a technique he used not only in this work but also in many others.[12] The light brown color and the grain of the wood give translucent qualities to the water in the foreground, connect the city in the middle plane visually to it **(fig. 3)**, and give a lively quality to the clouds in the sky (**fig. 4**). Van Goyen's deft exploitation of the brown tone makes abundantly clear that the ground does not function in isolation. Together with the paint layers, a colored ground defines the suggested three-dimensionality of objects in a painting. At the same time, it serves to connect the many different parts in a painting, thus contributing to a sense of unity. Because of these multiple functions, it is also highly efficient.

8. Between 1580 and 1625, more and more Dutch painters learned how to exploit the advantages of colored grounds, which remained popular throughout the century. Colors ranged from softer, subdued tones to stronger ones. Sometimes the ground can be seen because a painting has been left unfinished. However, Rembrandt van Rijn (1606–1669), Frans Hals (1582–1666), Jacob van Ruisdael (1628–1682), sometimes Johannes Vermeer (1632–1675), and many other artists made inventive, intentional use of their grounds in finished paintings, leaving small areas visible or allowing the ground to shine through translucent paint layers.

Seventeenth-Century Ground Layers and Their Names

9. "Ground" is the broad term used in modern art historical research for the layers applied to a painting support. Grounds typically consist of powdered pigments and filling materials in a binder—the liquid that binds the powders and gives consistency to the layer. A seventeenth-century ground consists of several layers and serves to create a surface suitable for painting. As Wilhelmus Beurs (1656–1700), Dutch artist and author, wrote in his 1692 painting manual, *De Groote Waereld in 't Kleen Geschildert* (The big world painted small), the ground

makes "the open plane smooth and ready to bear the instruments and paints such that, if the piece is not good, it can [only] be blamed on the artist himself."[13]

10. Seventeenth-century ground layers tend to differ depending on the nature of the support, whether panel or canvas. This phenomenon can be observed when examining the paintings themselves and has also been described by seventeenth-century authors.[14] Beurs, for example, recommends preparing a panel with a first ground layer consisting of chalk and glue, followed by a layer of brown umber mixed with lead white and bound in oil. For canvas, the same author advises a size (glue) layer covered only with an oil-based pigmented ground, excluding the chalk and glue layer advised for panel.[15] **Figure 5** gives a schematic representation of the typical ground layers for a seventeenth-century panel or canvas.[16]

11. Each of the ground layers had its own function. A size layer sealed off the canvas fibers from the oils used in subsequent layers, as this oil could lead to the degradation of the canvas. The size layer typically consisted of a glue layer or a starch paste and was so thin that it is almost impossible to discern in painting examinations. It is mainly through historical recipe research that we know of this layer.[17] The proper ground layer(s)—consisting of pigments, bulking materials, and a binder—evened out the texture of the support and provided painters with an uniformly colored surface that was "smooth and ready to bear" the brushwork and oil paints, in Beurs's words. In the seventeenth century, oil was the binder of choice for most layers, with the exception of chalk-based layers on panel, for which animal glues were used. The pigments gave the layer(s) color, and bulking materials—often colorless powders such as chalk or sand—could be added to increase its volume or change its consistency. Historical recipes mention the use of spatulas, blunt knives, or brushes for the application of ground layers. While Beurs advises only a single ground layer, and some paintings indeed were executed on single ground layers, other contemporaneous authors and painting analyses demonstrate that many seventeenth-century artists used grounds of two layers, and sometimes even more.

12. Seventeenth-century recipes for panel preparation often omit a size layer. No reason is provided, but it seems logical that a first layer of chalk bound in glue, which was typical for panels, would make a size layer unnecessary. Another feasible explanation could be that a wooden panel did not need to be sealed off from the oil-bound ground layers in the same way as canvas, which is much more absorbent and can degrade due to the chemical interaction between oil and the linen fibers.

13. The difference between the layers applied to panel and canvas relates to their different properties, and thus the way they were used. One of the advantages of canvas is that it can be rolled or bent, which is especially convenient for the large-format works for which it was often used. A ground bound in glue would easily crack when the support was rolled up, whereas oil is more flexible. Thus, an oil-bound layer is a more logical choice for a canvas ground. This motivation is mentioned in historical sources.[18]

14. In seventeenth-century Dutch sources and the secondary literature on these sources, two terms are regularly encountered when grounds are discussed: *primuersel* and *imprimatura*. The Dutch *primuersel* is how Karel Van Mander, in his 1604 *Schilder-Boeck*, described a semitranslucent, pigmented, oil-based layer. Through this layer, Van Mander wrote, the

underdrawing remains visible, which made the painting look "half painted." This was the technique ascribed by Van Mander to his "modern ancestors" to set up a composition on panels.[19] The term is very similar to the word *imprimatura*, which appears in the second edition of Giorgio Vasari's *Lives of the Artists* (1568). Vasari uses the term *imprimatura* more broadly, to describe oil-bound second ground layers, without any indication that this layer was semitranslucent or thin.[20] The term is also similar to *imprimeure*, employed in French seventeenth-century sources.[21] In English seventeenth-century sources we encounter the term "priming," both as a verb and as a noun. The verb describes the action of applying a ground; the noun is used to describe the layer itself. In seventeenth-century written sources, "priming" occurs only in descriptions of oil-bound ground layers, so it seems to have carried narrower meaning than some other terms employed to describe grounds.[22]

15. The discussion above makes clear that authors made different use of terms such as *imprimatura* and *primuersel*. The uncertainty this leads to was continued into the twentieth century, as noted by Nico van Hout in 1998.[23] Motivated by his study of sixteenth- and seventeenth-century sources, Van Hout chose to use the term *imprimatura* to describe the colored top layer of a ground, whether opaque or transparent. A lower ground layer he referred to as a "ground layer."[24] Stols-Witlox (2016), noting the same confusion, made a different choice, avoiding the terms *imprimatura* and *primuersel* altogether and instead writing about first, second, and third ground layers. This special issue follows Stols-Witlox's terminology, describing all preparatory layers consisting of pigments and binder with the term "ground layer." We consider this terminology to be the clearest, as it avoids any confusion about the interpretation of the term *imprimatura*. When pigments are added to modify the tone of a ground layer applied to the whole support, we use the term "colored ground." The colored ground category thus includes cream or light pink tones only if the tone can be attributed to the addition of colored pigments. It is important to make this distinction, as tonality may change with time. For example, an originally white chalk and glue layer may become cream or yellow even if this layer was not intended to be a colored one. Chalk-based layers can also become orange-yellow as a result of absorbing oil from subsequent paint layers or due to the absorption of oil and varnish that yellow with age.

16. There is one particular type of ground layer for which we do use the term *imprimatura*. This is the streaky, brownish gray layer used by Flemish artist Peter Paul Rubens (1567–1640) and some of his contemporaries on chalk/ glue prepared panels, in particular on oil sketches (**figs. 6 and 7**). The reason that we make an exception for this very thin, semitransparent streaky layer is the particularly strong connection between this type of ground and the term *imprimatura*. Describing such a streaky *imprimatura* as a streaky ground would go against current convention.[25]

Dead Color, Working Up, and Retouching: The Layers of Seventeenth-Century Paintings

17. The color of the ground is what the artist saw while painting; therefore, historians must think about it in the context of the painting process. In the seventeenth century, the painting process typically consisted of three distinct phases or layers, each with a different name and function.[26] Due to their broad application, these three phases can be used to describe the

making of paintings in both the Northern and Southern Netherlands. In the first phase, the painter set up the composition. When done in ink or in a dry material such as black or white chalk, this phase is called the underdrawing. When the composition was set up with an oil paint instead, the layer is referred to in the Netherlands as the *doodverwen* (dead coloring). Some artists employed both, starting with a rough sketch that was further developed with paint. After executing the underdrawing and/or dead color, the artist could still see the ground between the lines of the dry drawing material or between the monochrome or colored dead-color areas. The second phase was called the "working up" of the painting: *opwerken* or *opschilderen* in historical Dutch sources. An artist could follow this with a third phase, reinforcing highlights and deep tones to give extra emphasis. This phase was called *retockeren* (retouching).[27]

18. For the dead-color phase, artists used two strategies, both of which are recommended in contemporaneous sources. One was to set up the dead color on top of the colored ground in a rather liquid, monochrome paint, typically in a dark color, sometimes involving rough indications of the main color areas in the painting. This type of dead color is often referred to as an "oil sketch" in art historical literature. A gray or brownish colored ground could act as a midtone in this phase, as seen in an unfinished painting by Rubens, *Henry IV at the Battle of Ivry* (**fig. 8**), which offers an example of what a painting might look like at this stage. The painting shows how Rubens first indicated the main shapes with thin brown paint that he applied directly onto the gray ground—for instance, in the falling soldier on horseback in the foreground (**fig. 9**). The gray ground acts as a midtone and sits between the rough indications of highlights and shadows in the slightly more worked-up areas, where Rubens added some indication of color. The technique that is so clearly visible in this painting was also used by other artists in the Northern Netherlands, as discussed in the articles by Petria Noble, Anne Haack Christensen, and Marya Albrecht and Sabrina Meloni in this issue.[28] The background, for which Rubens engaged his colleague Peter Snayers (1592–1667), is in a relatively advanced state of execution—in line with the advice voiced in contemporaneous sources to develop the composition from back to front—and here the gray ground is covered to a higher degree (**fig. 10**).[29]

19. The second strategy consisted of preparing areas locally for the color they would receive in the next phase: the *opwerken* or *opschilderen*. To this end, a painter would typically apply monochrome areas of color, effectively blocking out any influence of the colored ground. Such monochrome underpainting was only applied in areas where the ground tonality might disturb or weaken the effect a painter aimed for. Because the colored ground would remain on view in surrounding areas, the painter could still use it to harmonize the tonality of the painting. As a base tone, a colored ground has a subtle influence through its visibility in transitions between still life and background, for instance, or between the leaves of flowers.

20. Arie Wallert draws attention to Gerard de Lairesse's (1641–1711) advice for monochrome dead coloring for landscape painting (published 1712). De Lairesse recommends using cheap pigments in blue underneath the sky (indigo and white) and in gray or green for the area that was to become the landscape (umber and white or lamp black and light ocher).[30] As Melanie Gifford points out, mannerist Flemish artists frequently used three zones in the underpainting stage: a brown foreground and a green middle zone, with light

blue in the distance.[31] Examples of this technique in flower still life painting are discussed by Nouchka de Keyser, who demonstrates how artists like Jan Davidsz. de Heem (1606–1684) applied oval-shaped local underpainting below their flowers. These local underpaintings were flower-specific: vermilion below red flowers, ocher below yellow flowers, and lead white ovals for white flowers. While largely covered in the finished painting, these oval underpaintings can be revealed through non-destructive investigative techniques like macro X-ray fluorescence scanning (MA-XRF), which can show where a chemical element is present. The location of vermilion, used for the underpainting of red flowers, is revealed by the presence of chemical element mercury (Hg) (**figs. 11 and 12**).[32]

21. The more finished background in Rubens's Henri IV (**see fig. 10**) gives insight into what a painting might look like in the second stage of working up (opwerken). In this phase, the figures, buildings, and main details are executed in color. Rubens used warmly colored glazes to create the deeper tones, a step called *verdiepen* (deepening) in contemporaneous sources. He also added lighter, opaque scumbles, an action described as *verhoogen* (raising) in those same sources, to complete the illusion of three-dimensionality. With the working up finished, a painting appeared complete, or nearly so.[33]

22. Paints were typically allowed to dry between all three phases, as wet-in-wet application would result in the smearing of lower layers, destroying the depth and purity of the tones. The layered-ness of these paintings means that the stages can be distinguished in paint cross sections, where they are visible as distinct lines of color that sit on top of each other (**fig. 13**). However, all three stages are not always present throughout a painting. In more openly or sketchily executed works, an artist could choose to leave visible areas belonging to the dead color phase or even the ground itself.

23. The above description of how the color of the ground played a role throughout the painting process of a seventeenth-century artist shows how this color assisted and influenced a painter in establishing the division between light and dark. Furthermore, the ground color acted as a touchstone for the tonal values throughout all stages of the painting process.

Reconstructions to Investigate the Role of Ground Color Within the Layer System

24. Reconstructions are a tested way to investigate the workings of historical materials as well as the need and reasons for the particular processes artists used in painting, as discussed in depth in the essay by Maartje Stols-Witlox and Lieve d'Hont in this issue.[34] They are of particular relevance in the investigation of colored grounds. As discussed earlier, the seventeenth-century system of layering differed significantly from fifteenth- and sixteenth-century methods (**see figs. 1 and 2**), and these differences influenced not only the visual appearance of the finished painting but also what painters saw while developing their compositions, and thus what they responded to in each consecutive stage of the painting process. The influence of the ground color differed in each stage of painting.

25. The way that reconstructions help investigate this phenomenon can be illustrated with a comparison between a painting executed on a white ground, using Eyckian methods, and the building up of a painting according to seventeenth-century practice. In her step-by-step reconstruction, Indra Kneepkens retraces the execution of Jan and/ or Hubert Van Eyck's *Three Marys at the Tomb*. On the white ground (**fig. 14)**, the underdrawing was applied (**fig. 15**), followed by an unpigmented isolation layer. The painting was then slowly built up in multiple layers, from opaque base tones to more transparent glazes in the final layers of the painting. To gain the required depth of tone, the glazes were applied in multiple layers, as a single thick layer would not dry without wrinkling, cracking, or even dripping down the paint surface. This reconstruction also shows that every section of the painting has its own distinct buildup: various shades of red below the red draperies, blues below the ultramarine glazes of Mary's dress, and pale yellow and orange as base layers for the coat of the sleeping guard in front of the tomb (**figs. 16, 17, 18, 19**).

26. The Eyckian methods stand in strong contrast to the buildup of Ferdinand Bol's large *Elisha Refusing the Gifts of Naaman* from 1661 (**fig. 20**). A reconstruction by University of Amsterdam Conservation and Restoration student Chloe Chang of a section from this painting (the girl leaning out of the window on the right-hand side of the large canvas) shows how a harmonious tonality can be created by making use of the gray ground and brownish dead color (figs. 21–24). Bol worked on a canvas covered with a ground consisting of two layers, a first red layer and a second gray one (**fig. 21**). After sketching out the most important elements in the composition with a painted underdrawing (**fig. 22**), Bol applied the dead coloring in a warm gray for the main contours and lights/ darks, reinforced with some roughly indicated color areas (white, some skin tones, and the midtone of the red bodice; **(fig. 23).** In the working up, he gave the painting its details, and most of the ground disappeared beneath opaque skin tones, dark hair, and the highlights and shadows in the girl's dress. Not everything was covered, though; Bol allowed the ground to shine through in the architecture and in transitions between midtones and shadows (**fig. 24**). The difference between fifteenth-century and seventeenth-century methods is very clear when we compare how light areas are created. Bol made the white of the girl's skin and clothing using thick applications of opaque lead white, while Van Eyck created the light skin tones with thin layers only partly covering the white ground. In the Bol reconstruction, the grayish brown of the ground and the dead color retain a visual function in the final painting, contributing to the harmony and balanced tonality that was considered so important in Dutch seventeenth-century art.

The Study of Colored Grounds in Netherlandish Art of the Sixteenth Century

27. AColored grounds became ubiquitous in seventeenth-century Netherlandish art for reasons that are explored in the essays in this issue. However, in the Low Countries they have a story that goes back to the first decades of the sixteenth century. That story is interesting and important in its own right, but it also contextualizes the developments in the seventeenth century—the focus of the present issue. Very little has been written on colored grounds in sixteenth-century Netherlandish art. For lack of data and detailed study, just how and when

colored grounds reached the Netherlands is still not entirely clear. We now understand the journey to be more complex and circuitous than was initially thought.

28. Until now, the most influential publication on the origin and development of colored grounds in Netherlandish art was the article by art historians Hessel Miedema and Bert Meijer published in 1979.[35] As noted above, the nature of this essay was largely exploratory due to the paucity of technical data. The article's most important suggestion—that the practice of painting on colored grounds traveled from Italy to the Netherlands—has not been seriously questioned until recently. Miedema and Meijer argued that painting on colored grounds followed from an interest in new stylistic developments that Dutch artists had encountered in Venetian art around 1500. These developments constituted a move away from the use of more localized colors toward a preference for tonal harmonies, which was appreciated as a closer approximation of the visual experience of reality.[36]

29. Miedema and Meijer also observed that Netherlandish artists did not merely copy the existing technique of painting on colored grounds. Instead, they described how Dutch artists gradually found their own ways of achieving tonal color harmonies. Artists working between 1560 and 1590 still painted on traditional light-colored grounds. For tonal harmony, they relied on the selection of pigments, buildup of layers, and paint application (**fig. 25**).[37] Painters operating between 1580 and 1610 were the first in the Low Countries to work regularly on more strongly colored grounds on canvas (**fig. 26**).[38] They too were interested in tonal harmony and sought to achieve a natural spatial effect of figures and objects in the *ordinantie* (ordinance): the composition of a scene on the flat surface and in the suggested space at the same time.[39] Like their predecessors, they did not significantly change their manner of painting, making use of the tinted ground mainly in the contours, instead of following the broad manner of the Italians. Only the fourth generation of Netherlandish painters, including Rubens and Rembrandt, fully exploited the Italian combination of open brushwork with impasto and glaze over a tinted underlayer.[40]

30. In the decades after the publication of Miedema and Meijer's article, the nuances of its argument were lost, and the notion that colored grounds came from Italy and moved north gradually evolved into a widely accepted (if somewhat vague) article of faith. It was never seriously challenged, notwithstanding the fact that more recent research indicates alternative routes by which artists may have discovered the potential of colored underlayers. In her examination of the painting technique of Hieronymus Bosch (1440–1516), for example, Abbie Vandivere found that on his white grounds, Bosch sometimes locally applied gray layers.[41] This allowed Bosch to work quickly and efficiently, especially in his landscapes, houses, and flesh tones.[42]

31. The sixteenth-century Northern interest in and awareness of how colored grounds could enhance three-dimensional effects fit within a broader interest in toned supports. Iris Brahms has studied the use of colored paper across Europe, a practice that started as early as the fifteenth century. She points out that artists used colored paper as a midtone in drawings as an efficient way to suggest space and maintain tonal unity.[43] Although the technique is largely different—the dead coloring stage of painting is absent in drawing—the function of the colored surface to modulate transitions between highlights and shadows in drawing is

similar.[44] The precise relationship between drawing and painting on a colored surface awaits further exploration.

32. While the developments in the spread and use of colored ground in sixteenth-century Northern European art still need thorough examination, recently much work has been done on Netherlandish (mostly Dutch) painting between 1580 and 1650, notably by Moorea Hall-Aquitania in her dissertation "Common Grounds: The Introduction, Spread, and Popularity of Coloured Grounds in the Netherlands, 1500–1650."[45] Hall-Aquitania is the first to challenge the largely unquestioned primacy of the Italian narrative, as well as the assumption of a linear technical development with a single point of origin. The earliest painting on a strongly colored ground in the dataset that she compiled for her study is Cornelis Ketel's *The Company of Captain Dirck Jacobsz Rosecrans and Lieutenant Pauw* (1588; **fig. 27**).[46] Ketel never traveled to Italy, but he—like other early adopters, such as Cornelis Cornelisz van Haarlem (1562–1638) and Abraham Bloemaert (1566–1651)—did reach the French court at Fontainebleau, another sixteenth-century center known for the use colored grounds.[47]

33. Based on Hall-Aquitania's recent work, there can be no doubt that knowledge of local practices, attentiveness to foreign traditions, a sense of experimentation, an interest in open brushwork and in tonal harmony, and an awareness of the efficiency of colored surfaces as a basis to paint on all played their part in the spread of colored grounds. What was needed for colored grounds to become ubiquitous was a stimulus to upscale the new and still-experimental practice. As Hall-Aquitania writes, the unparalleled development of a market for paintings between 1580 and 1625, in combination with a taste for a new kind of realism, provided the final push for the hidden revolution of colored grounds in seventeenth-century Netherlandish art.[48] This is confirmed by the contributions to this special issue.

The Special Issue

34. **The eight articles in this special issue can be read independently, but they also have a cumulative value because their topics interlock. Together they offer broader insights into the historiography of colored grounds, how artists and their suppliers exploited the optical effects that colored grounds made possible, and the methods that art history can employ to trace the impact of this revolutionary innovation.

35. Reviewing published literature on colored grounds in seventeenth-century Netherlandish painting, Elmer Kolfin argues that the introduction of colored grounds made possible a special kind of realism that eventually became canonical in the reception of Netherlandish painting of the seventeenth century. In her discussion of colored grounds in French art before 1610, Stéphanie Deprouw-Augustin explores the wide variety of colored grounds French artists employed in mural and easel painting long before their Italian and Netherlandish peers, a situation that complicates the hypothesis developed by Miedema and Meijer that colored grounds traveled from Italy to the Netherlands. Her research shows that an alternative suggestion by Miedema and Meijer merits our attention: to take Fontainebleau seriously as another possible origin for the development of colored grounds in Netherlandish art. Focusing on the impact of professional primers on local artistic

practice and how the relationship between artist and supplier contributed to the rapid spread of colored grounds, Hall-Aquitania sheds light on the crucial role of professional primers in the development and spread of colored grounds in the Netherlandish seventeenth century.

36. The next three articles are case studies that represent the impact of colored grounds on the techniques and visual appearance of seventeenth-century painting. They demonstrate the variety of ways in which colored grounds were used by different artists across genres and also within the oeuvre of single artists. Petria Noble's contribution on Rembrandt describes his use of different types of grounds throughout his oeuvre and traces the relationship between ground color, style, and pictorial effects within this master's body of work. Sabrina Meloni and Marya Albrecht's contribution focuses on the genre of still life painting, following from a comprehensive study of the still life paintings in the collection of the Mauritshuis (The Hague). Their article studies the use of locally available grounds, particularly a special category of dark, near-black ground layers. Anne Haack Christensen discusses the relationship between representation and reality in the oeuvre of Cornelis Gijsbrechts (1625–1675) by comparing Gijsbrecht's actual practice with the primed canvases that he depicted in some of his *trompe l'oeil* still lifes.

37. Databases proved to be a crucial tool in Hall-Aquitania's doctoral research on the development and spread of colored grounds, as they help to identify trends over time and geography. The innovative database she developed with Paul J. C. van Laar is one of two methodology-focused articles in this issue. Introducing the database and explaining its construction, the authors show how technical art history benefits from digital tools and how strategies to incorporate data of variable quality and age can be a model for future comparative research projects.[49] The second methodological reflection, authored by Maartje Stols-Witlox and Lieve d'Hont, takes two case studies, one on the ubiquitous gray-over-red double ground and one on a highly exceptional black ground. This article argues for the effectiveness of reconstructions as a method of art historical inquiry that helps to answer questions about style, pictorial effect, and artistic motives.

38. Individually and combined, the articles demonstrate why colored grounds were so important in Netherlandish art and how their study enlightens us on broader art historical developments. There is still much to discover and learn about the topic of colored grounds. The editors of this special issue hope that the essays will help *JHNA* readers look more deeply into the layers of paintings and their effects on the surface, and that it will stimulate further research and deeper understanding of the hidden revolution of colored grounds in seventeenth-century Netherlandish art.

Acknowledgements

The *Down to the Ground* project was a collaborative effort from the start. We, the project team from the University of Amsterdam and Delft University of Technology, would like to express thanks to all our project partners: Frans Hals Museum, Haarlem; Mauritshuis, The Hague; Rijksmuseum, Amsterdam; Koninklijk Museum voor Schone Kunsten Antwerpen; National Gallery, London; Statens Museum, Copenhagen; and the RKD, The Hague. Many thanks also to all speakers and discussants who joined the study day in preparation for this special issue in May 2024, many of whom are also contributors: Marya Albrecht, Iris Brahms, Stéphanie Deprouw-Augustin, E. Melanie Gifford, Anne Haack Christensen, Ella Hendriks, Erma Hermens, Lieve d'Hont, Paul van Laar, Marta Melchiorre di Crescenzo, Sabrina Meloni, Joanna Russell, and Marika Spring. Moorea Hall-Aquitania, who was also a speaker, deserves a special thank you for her exemplary management of the editorial process. The *Down to the Ground* project was made possible through the generous support of the Netherlands Organization for Scientific Research (NWO).

Biographies

Maartje Stols-Witlox, an art historian and paintings conservator, is associate professor of paintings conservation at the University of Amsterdam. Her PhD dissertation, published as *A Perfect Ground: Preparatory Layers for Oil Paintings 1550–1900* (Archetype, 2017), investigated historical recipes for grounds in northwest Europe, looking at patterns of use and artists' motives and employing reconstructions to understand the actual effects of the methods described. Since then, Stols-Witlox's research interests have broadened to include conservation methodology and history, with emphasis on green sustainability..

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Illustrations

Fig. 1 Attributed to Jan van Eyck and Workshop, *The Three Marys at the Tomb*, ca. 1425–1435, oil on panel, 90 x 71.5 cm. Museum Boijmans Van Beuningen, Rotterdam, inv. no. 2449 (OK). Photograph: Studio Tromp

Fig. 2 Jan van Goyen, *View of Leiden from the North-East*, 1650, oil on panel, 66.5 x 97.5 cm. Museum de Lakenhal, Leiden, inv. no. S115 (artwork in the public domain)

Fig. 3 Van Goyen, *View of Leiden from the North-East* (fig. 2), detail showing water in the foreground and the city in the middle ground

Fig. 4 Van Goyen, *View of Leiden from the North-East* (fig. 2), detail showing clouds in the sky

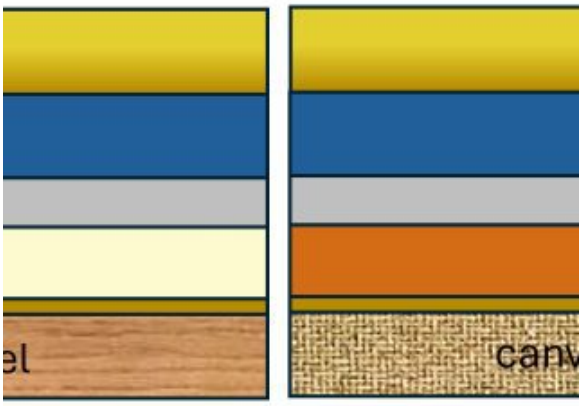

Fig. 5 Schematic rendering of the buildup of layers in a typical seventeenth-century painting executed on panel (left) and on canvas (right). Image: Authors.

Fig. 6 Peter Paul Rubens, *The Triumph of Rome: The Youthful Emperor Constantine Honoring Rome*, ca. 1622–1623, oil on panel, 54 x 96 cm. Mauritshuis, The Hague, inv. no. 837

Fig. 7 Rubens, *The Triumph of Rome* (fig. 6), detail showing the streaky imprimatura between the brushstrokes of the figures as broad gray streaks in horizontal and vertical directions

Fig. 8 Peter Paul Rubens and Peter Snayers, *Henry IV at the Battle of Ivry*, ca. 1628–1631, oil on canvas, 174 x 260 cm. City of Antwerp Collection/ Rubenshuis, Antwerp, inv. no. RH.S.181 (artwork in the public domain)

Fig. 9 Rubens and Snayers, *Henry IV at the Battle of Ivry* (fig. 8), detail of the fighting soldiers in the foreground

Fig. 10 Rubens and Snayers, *Henry IV at the Battle of Ivry* (fig. 8), detail of the background executed by Peter Snayers

Fig. 11 Jan Davidsz. de Heem, *Still Life with Flowers in a Glass Vase*, 1650–1683, oil on copper, 54.4 x 36.5 cm. Rijksmuseum, inv. no. SK-C-214. Image: Rijksmuseum Amsterdam (artwork in the public domain)

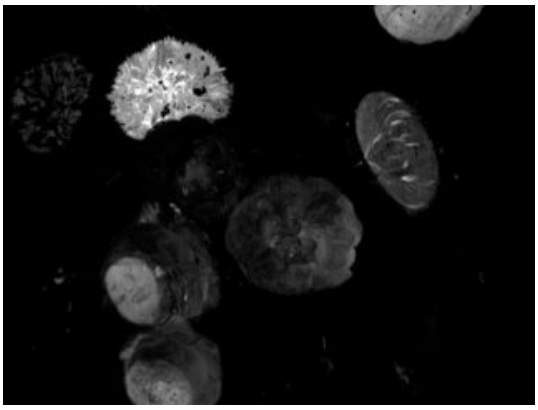

Fig. 12 MA-XRF mapping of De Heem, *Still Life with Flowers in a Glass Vase* (fig. 11), showing (in white areas) where the presence of the red pigment vermilion is detected through the presence of the chemical element mercury (Hg-L line). In dark areas, no vermilion is detected. Mapping by Nouchka de Keyser, in Nouchka de Keyser et al., "Jan Davidsz. de Heem (1606–1684): A Technical Examination of Fruit and Flower Still Lifes Combining MA-XRF Scanning, Cross-Section Analysis and Technical Historical Sources," *Heritage Science* 5, no. 1 (2017): 38, https://doi.org/10.1186/s40494-017-0151-4.

Fig. 13 Cross-section from Rembrandt van Rijn, *A Scholar in His Study*, 1634, oil on canvas, 141 x 135 cm. National Gallery Prague, Czech Republic, inv.nr.: DO 4288, taken at the right edge in the background, showing a double ground consisting of a lower layer of red earth pigments covered with a gray layer based on lead white. Image prepared by Jeanine Walcher, RKD Technical, https://rkd.nl/technical/5010791.

Fig. 15 Van Eyck, *The Three Marys at the Tomb* (fig. 1), the reconstruction panel after application of the underdrawing and during the application of the first paint layers. Image: Indra Kneepkens

Fig. 16 Van Eyck, *The Three Marys at the Tomb* (fig. 1), the reconstruction during the first stage of application of the colored underlayers. Image: Indra Kneepkens

Fig. 17 Van Eyck, *The Three Marys at the Tomb* (fig. 1), the reconstruction during the first stage of application of the colored underlayers. Image: Indra Kneepkens

Fig. 18 Van Eyck, The *Three Marys at the Tomb* (fig. 1), the reconstruction panel in a near-finished state. More details have been applied, such as individual plants, leaves, highlights on the weaponry. Image: Indra Kneepkens

Fig. 19 Van Eyck, *The Three Marys at the Tomb* (fig. 1), the finished reconstruction. Image: Indra Kneepkens

Fig. 20 Ferdinand Bol, *Elisha Refusing the Gifts of Naaman*, 1661, oil on canvas, 151 x 248.5 cm. Amsterdam Museum, inv. no. SA 7294 (artwork in the public domain)

Fig. 21 Bol, *Elisha Refusing the Gifts of Naaman* (fig. 20), reconstructed detail showing a gray second ground. Image: Chloe Chang, University of Amsterdam

Fig. 22 Bol, *Elisha Refusing the Gifts of Naaman* (fig. 20), reconstructed detail showing a painted underdrawing. Image: Chloe Chang, University of Amsterdam

Fig. 23 Bol, *Elisha Refusing the Gifts of Naaman* (fig. 20), reconstructed detail showing the composition laid in with a fluid brown paint and first working-up with color. Image: Chloe Chang, University of Amsterdam

Fig. 24 Bol, *Elisha Refusing the Gifts of Naaman* (fig. 20), reconstructed detail showing the finished work after highlights and the deepest shadows have been applied. Image: Chloe Chang, University of Amsterdam

Fig. 25 Dirck Barends, *The Adoration of the Shepherds*, ca. 1565, oil on panel, 277 x 370 cm. Museum Gouda, inv. no. 55234

Fig. 26 Cornelis Cornelisz van Haarlem, *Baptism of Christ,* ca. 1589, oil on canvas, 62.5 x 82.5 cm. Frans Halsmuseum, Haarlem, inv. no. os I-57

Fig. 27 Cornelis Ketel, *The Company of Captain Dirck Jacobsz Rosecrans and Lieutenant Pauw*, 1588, oil on canvas, 204 x 410 cm. Rijksmuseum, Amsterdam, inv. no. SK-C-378

Endnotes

1. Technological developments between 1550 and 1650 are difficult to clearly connect to the Northern or Southern Netherlands, due to shifting borders and intense artistic exchange through painters and artistic commissions. Because of its broader use, encompassing both the Northern and Southern Netherlands, we therefore refer to the area we discuss as Netherlandish, and not Dutch.
2. Eric Jan Sluijter, *Verwondering over de schilderijenproductie in de Gouden Eeuw,* (Amsterdam: Amsterdam University Press, 2003); Eric Jan Sluijter, "On Brabant Rubbish, Economic Competition, Artistic Rivalry and the Growth of the Market for Paintings in the First Decades of the Seventeenth Century," *Journal of Historians of Netherlandish Art* 1, no. 2 (Summer 2009), DOI: https://doi.org/10.5092/jhna.2009.1.2.4.

3. Reinier Baarsen et al., *Dawn of the Golden Age: Northern Nederlandish Art 1580–1620*, (Amsterdam: Rijksmuseum 1993); Christopher D. M. Atkins, ed., Dutch Art in a Global Age (Boston: MFA Publications, 2023).
4. John Michael Montias, "The Influence of Economic Factors on Style," *De zeventiende eeuw* 6, no. 1 (1990): 49–58.
5. Montias, "Influence," 53: "It would be instructive to study the techniques he [Jan van Goyen] and other artists employed in carrying out commissions and in comparing them with works that they may, more or less plausibly, be said to have sold on the market."
6. The Down to the Ground Project ran from 2019 to 2024. It was led by Maartje Stols-Witlox together with Elmer Kolfin and Erma Hermens, all from the University of Amsterdam, and Roger Groves at the Delft University of Technology. The project website gives more detail and lists all team members and institutional partners: "Down to the Ground: A Historical, Visual and Scientific Analysis of Coloured Grounds in Netherlandish Paintings, 1550–1650," University of Amsterdam, accessed November 11, 2025, https://www.uva.nl/en/shared-content/subsites/amsterdam-school-for-heritage-memory-and-material-culture/en/projects/down-to-the-ground/about/about.html.
7. See Moorea Hall-Aquitania and Paul J. C. van Laar, "Under the Microscope and Into the Database: Designing Data Frameworks for Technical Art Historical Research," *Journal of Historians of Netherlandish Art* 17, no. 2 (2025), DOI: https://doi.org/10.5092/jhna.2025.17.2.8.
8. The database is operable from October 2025 for at least five years at "Down to the Ground," RKD Studies, accessed November 11, 2025, https://downtotheground.rkdstudies.nl.
9. Hessel Miedema and Bert Meijer, "The Introduction of Coloured Ground in Painting and Its Influence on Stylistic Development, with Particular Respect to Sixteenth-Century Netherlandish Art," *Storia dell'Arte* 35 (1979): 79–98.
10. The attribution to Jan van Eyck and the painting's precise date were recently questioned, see Frans Nies, "The Attribution of Jan van Eyck's *Three Marys at the Tomb* Reconsidered: A Historiographical Analysis of a Fifteenth-Century Panel," *Oud Holland* 139, nos. 2–3 (2025): 74–101.
11. Based on surface examination. To our knowledge the painting has not been sampled.
12. Van Goyen used a light brown over chalk ground in most of his sampled paintings. See Moorea Hall-Aquitania, "Common Grounds: The Introduction, Spread, and Popularity of Coloured Grounds in the Netherlands 1500–1650" (PhD diss., University of Amsterdam, 2025); and the *Down to the Ground* database (see n. 8). On Van Goyen's technique in general, see Melanie Gifford, "Style and Technique in the Evolution of Naturalism: North Netherlandish Landscape Painting in the Early Seventeenth Century" (PhD diss., University of Maryland, 1997).
13. Wilhelmus Beurs, *De Groote Waereld in 't Kleen Geschildert, of Schilderagtig Tafereel van 's Weerelds Schilderyen* (Amsterdam: Van Waesberge, 1692), 20: "Zoo dat nu het opene velt

glad en bequaam is; om de werktuigen en hare verwen te verdragen, zoodanig, dat word het stuk niet goed, 't zal den konstenaar zelve geweten worden" (So that the now open field is smooth and suitable; to bear the t ools and her paints, such, that, if the piece does not become good, it will be blamed on the artist self). All translations by the authors unless otherwise noted.

14. The articles in this issue mostly discuss panel and canvas. Copper was also used, and it usually received an oil-based ground. See Isabelle Horowitz, "The Materials and Techniques of European Paintings on Copper Supports," in Michael K. Komanecky, *Copper as Canvas: Two Centuries of Masterpiece Paintings on Copper 1575–1775* (Oxford, UK: Oxford University Press, 1998): 68–73.

15. Beurs, *Groote Waereld*, 19–20.

16. The layer buildup depicted and the discussion of the function of these layers are based on Maartje Stols-Witlox, *A Perfect Ground: Preparatory Layers for Oil Paintings 1550–1900* (London: Archetype, 2017), x–xv.

17. Maartje Stols-Witlox, "Size Layers for Oil Painting in Western European Sources," in *Art Technology: Sources and Methods*, ed. Stefano Kroustallis et al. (London: Archetype, 2008), 147–165.

18. For example, the 1568 edition of Vasari advised not to use gypsum and glue to prepare canvases that were to be rolled, as this would lead to flaking. "Gli uomini per potere portare le pitture di paese in paese, hanno trovato la comodità delle tele dipinte, come quelle, che pesano poco, & avolte, sono agevoli a transportarsi. Questo a olio, perch'elle siano arrendevoli, se non hanno a stare ferme non s'ingessano; atteso, che il gesso vi crepa fu arrotolandole" (To allow carrying paintings from country to country, people have discovered the ease of painted canvases, which, because they weigh little, and through this are easy to transport. To keep those in oil pliable, if they are not remaining stationary they are not gessoed, because gesso would crack if they are rolled). Giorgio Vasari, Le Vite de'piu Eccellenti Pittori, Scultori, e Architttori (Florence: Haeredes Bernardi Iuntae, 1568), 53.

19. 17. "Maer t'fraeyste was dit/ dat sommighe namen Eenich sine-kool swart / al fijntgens ghewreven Met water / ja trocken / en diepten t'samen Hun dinghen seer vlijtich naer het betamen: dan hebbenser aerdich over ghegheven Een dunne primuersel / alwaer men even Wel alles mocht doorsien / ghestelt voordachtich: End'het primuersel was carnatiachtich" (But the most beautiful was this / that some took some charcoal black / ground finely with water / yes drew / and shaded together their things very diligently as they should be: then they nicely applied on top a thin *primuersel* / that one can see through / what was made before: and the *primuersel* was flesh colored) [Note in the margin: "Trocken hun dinghen op het wit, en primuerden daer olyachtich over" ('drew their things on the white, and primed in oil on top.)] 18. "Als dit nu droogh was/ saghen sy hun dinghen Schier daer half gheschildert voor ooghen claerlijck / Waer op sy alles net aenlegghen ginghen / En ten eersten op doen / met sonderlinghen Arbeydt en vlijt / en de

verwe niet swaerlijck Daer op verladende / maer dun en spaerlijck / Seer edelijck gheleyt / gloeyend' en reyntgens 'Met wit hayrkens aerdich ghetrocken cleyntgens'" (When this was now dry / they saw their things as half painted before their eyes / upon which they cleanly applied everything / and finished in one layer / with special labor and diligence / and not loading the paint heavily / but thin and sparse / applied in very noble fashion / glowing and clean / with white hairs nicely drawn small) [Note in the margin: "Deden hun dinghen veel ten eerste op" (often finished in one layer)]. Karel van Mander, *Het Schilder-Bock* (Haarlem: Passchier van Westbusch, 1604), fols. 47v, 48r.

20. Vasari uses the term *imprimatura* to describe grounds on all supports: panel, canvas, metals, and walls. Vasari, *Vite,* 52–53. He also uses the term *mestica*, which to him is synonymous with imprimatura. For canvas painting, see Vasari, Vite, 52: "la mestica, o imprimatura" (the mestica, or imprimatura). For grounds on metal, see Vasari, Vite, 54–55: "una mano d'imprimatura di colore a olio, cioè mestica" (a layer of imprimatura in oil color, which is mestica). For panel painting, see Vasari, Vite, 52: "Ma conviene far prima una mestica di colori seccativi, come biacca, giallolino, terre da campane mescolati tutti in un corpo, & d'un color solo, & quando la colla è secca, impiastrarla su per la tavola. E poi batterla con la palma della mano tanto ch'ella venga egualmente unita, e distesa per tutto: il che molti chiamano l'imprimatura" (But it is worth first making a *mestica* of siccative pigments, like lead white, giallolino [lead-based yellow pigment], earth such as is used for bells, mixing it together into one material, and of one color, and when the size is dry, plaster it on the panel. And then beat it with the palm of the hand until it becomes evenly united and spread all over: which many call the imprimatura).

21. For an oil-bound ground on panel, see Theodore de Mayerne, *Pictoria, Sculptoria et Quae Subalternarum Artium Spectantia,* 1620–1644, London, British Library, Ms. Sloane 2052, fol. 99: "fort imprimeure a huile" (strong priming in oil). For an oil-bound ground for canvas, see Mayerne, Pictoria, fol. 11: "Imprimés avec blanc de plomb & un peu d'ombre. Une imprimeure suffit, si on y en met deux la toile sera plus unie" (Prime with lead white and a little umber. One priming suffices, if one puts on two the canvas will be more even). See also Mayerne, Pictoria, fol. 98v: "Deuant que parler du maniment des Couleurs a huille, il ne sera du tout hors du propos sy nous disons quelque chose de l'Imprimerye de laquelle selon comme elle est bonne ou mauuaise depend la beauté & Viuacité des Couleurs" (Before speaking of the handling of oil colors, it is no diversion from our subject if we say something about the priming, on which, whether it is good or bad, depends the beauty and liveliness of colors). See also André Félibien, *Des Principes de la Sculpture, de la Peinture, et des Autres Arts qui en Dépendent* (Paris: Jean-Baptiste Cognard, 1676), 409, describing a ground canvas: "une imprimeure de couleurs à huile" (a priming of colors in oil).

22. "Primer" is used, for instance, by Daniël King, *Secrets in the Noble Arts of Miniature or Limning*, 1653–1657, London, British Library, Ms. Additional 12.461, fol. 48. "Priming" is used to describe a mixture of lead white and red lead in oil in the anonymous

manuscript *The Art of Painting in Oyle by the Life*, 1664, London, British Library, Ms. Harley 6376, fols. 94–95, which distinguishes between this oil-based ground layer and the "whiting," by which the anonymous author describes a mixture of chalk and glue (94). Henry Peacham, Daniël King, and John Stalker and George Parker use "priming" to describe an oil-based ground composition: Henry Peacham, *The Compleat Gentleman* (1634; repr. Oxford: Clarendon 1906), 130; King, Secrets, fols. 52r, 52v; John Stalker and George Parker, *A Treatise of Japanning and Varnishing* (1688; repr. London: A. Tiranti, 1960), 54.

23. Nico van Hout, "Meaning and Development of the Ground Layer in Seventeenth Century Painting," in *Looking Through Paintings: The Study of Painting Techniques and Materials in Support of Art Historical Research*, ed. Erma Hermens, Annemiek Ouwerkerk, Nicola Costaras (Baarn: De Prom, 1998), 199–225.
24. Van Hout, "Meaning and Development," 200.
25. Van Hout, "Meaning and Development." See also Annetje Boersma, Annelies van Loon, and Jaap Boon, "Rubens's Oil Sketches for the Achilles Series: A Focus on the Imprimatura Layer and Drawing Material," *ArtMatters* 4 (2008): 82–89.
26. In the *Groot Schilderboek* by Gerard de Lairesse, these stages are described as *doodverwen*, *opschilderen*, and *retocqueeren of nazien* (retouching or controlling). Gerard de Lairesse, *Groot Schilderboek, Waar in de Schilderkonst in al haar Deelen Grondig werd Onderweezen, Ook door Redeneeringen en Printverbeeldingen Verklaard* (Amsterdam: Hendrick Desbordes, 1712), 1:12–15.
27. A full account is given by Gerard de Lairesse in his *Groot Schilderboek*, 1:13–14. This practice is not to be confused with reworking or improving the work of a pupil or colleague, which was also referred to as retouching in seventeenth-century sources. Rembrandt is known to have signed the print Third Oriental Head—a composition after Lievens—with "Rembrandt geretuck 1635" (Rembrandt retouched): Rembrandt van Rijn, *The Third Oriental Head*, Rijksmuseum, Amsterdam, inv. no. RP-P-OB-583. Many thanks to Perry H. Chapman for bringing this print to our attention. See also Ernst van de Wetering on Rembrandt's practice of retouching paintings by assistants and pupils, in J. Bruyn et al., *A Corpus of Rembrandt Paintings*, vol. 2, 1631–1634 (Dordrecht: Springer, 1986), 312.
28. Petria Noble, "The Role of the Colored Ground in Rembrandt's Painting Practice"(DOI: https://doi.org/10.5092/jhna.2025.17.2.5); Anne Haack Christensen, "Representation Versus Reality: Cornelis Norbertus Gijsbrechts's Depiction and Use of Colored Grounds" (DOI: https://doi.org/10.5092/jhna.2025.17.2.7); and Marya Albrecht and Sabrina Meloni, "Laying the Ground in Still Lifes: Efficient Practices, Visual Effects, and Local Preferences Found in the Collection of the Mauritshuis" (DOI: https://doi.org/10.5092/jhna.2025.17.2.6) *Journal of Historians of Netherlandish Art* 17, no. 2 (2025).
29. This painting and its unfinished state of execution are discussed in "Peter Paul Rubens, Hendrik IV in de slag bij Ivry, 1628–1631, collectie Rubenshuis," *Kunstwerk in*

focus (blog), Vlaamse Kunstcollectie, accessed August 6, 2025, https://vlaamsekunstcollectie.be/nieuws/peter-paul-rubens-slag-bij-ivry-rubenshuis. Executing the second stage of opschilderen from back to front was described by Gerard de Lairesse, *Groot Schilderboek*, 1:13–14: "Hier moetmen, om de beste manier te volgen, van achter beginnen, te weeten de lucht, en dus allengs na vooren toe, zo behoud men altoos een bekwame en vogtige grond achter de Beelden, om den uitersten omtrek daar in te doen verdwynen, het welk, anders begonnen, ondoenelyk is. Behalven dit is'er noch een voordeel in, dat niet min aangenaam als nut is, te weeten, dat men gewaar werd dat het stuk vorderd, en alles by malkander, zo in schikking, als houding wel staat, en daar door geduurig het oog kitteld en vermaakt, waar door de lust, zo menigmaal men het ziet, opgewekt en aangezet word" (Here one must, to follow the best manner, start from the back, namely the sky, and thus stepwise forwards, this way one retains a suitable and humid ground behind the figures, to make the outer contour disappear within, which, started otherwise, cannot be done. Besides this there is another advantage, which is no less pleasant and useful, namely, that one is aware that the piece progresses, and everything together, both in *schikking,* and *houding* stands well, and because of this continues to tickle and please the eye, because of which, as often as one sees it, enthusiasm is raised and reinforced. Ernst van de Wetering, in *Rembrandt: The Painter at Work* (Amsterdam: Amsterdam University Press, 1997), 32–41, discusses how Rembrandt van Rijn also worked in this order.

30. Arie Wallert, *Still Lifes: Techniques and Styles; The Examination of Paintings from the Rijksmuseum* (Amsterdam: Rijksmuseum, 1999), 21–22. The original quote is from Gerard de Lairesse, *Groot Schilderboek,* 1:331: "Eerst moeten wy onze gedachten op papier stellen, en dan na dezelve onze gissing maaken, hoe veel of hoe weinig lucht of grond bestreeken moet werden, blaauw of groen, geel of zwart. Tot deze gronden zal men geen fyne en kostelyke verwen gebruiken, maar gemeene, als zy slechts lyvig zyn en wel dekken. Tot het blaauw zal men neemen Indigo en wit; tot de grond, omber en wit, of lampzwart en lichten ooker; tot architectuur en ander steenwerk, omber, bruinen ooker, enz" (First we must transfer our thoughts to paper, and afterwards estimate, how much or how little sky or earth must be covered, blue or green, yellow or black. For these grounds one should not use fine and costly paints, but common ones, as long as they have body and cover well. For the blue one should take indigo and white; for the earth, umber and white, or lamp black and light ochre; for architecture and other masonry, umber, brown ochre, etc).

31. See also Melanie Gifford, "Style and Technique in Dutch Landscape Painting in the 1620s," in *Historical Painting Techniques, Materials, and Studio Practice*, ed. Arie Wallert, Erma Hermens, and Marja Peek, preprints of a symposium at the University of Leiden, Netherlands, June 26–29, 1995 (Marina Del Rey, CA: Getty Conservation Institute, 1995), 141. In her PhD dissertation, Hall-Aquitania remarks that, by abandoning this three-zone system and working on a colored ground instead, artists could speed up their painting

process, an important consideration when painting for the open market. Hall-Aquitania, "Common Grounds," 109.

32. Nouchka de Keyser et al., "Jan Davidsz. de Heem (1606–1684): A Technical Examination of Fruit and Flower Still Lifes Combining MA-XRF Scanning, Cross-Section Analysis and Technical Historical Sources," *Heritage Science* 5, no. 38 (2017), https://doi.org/10.1186/s40494-017-0151-4.
33. See Wallert, *Still Lifes*, 23–24; and Wetering, *Rembrandt: The Painter at Work*, 23–44, for more in-depth discussions of the three-stage system of painting and references to historical sources that provide details on this process.
34. Maartje Stols-Witlox and Lieve d'Hont, "Remaking Colored Grounds. The Use of Reconstructions for Art Technical and Art Historical Research," *Journal of Historians of Netherlandish Art* 17, no. 2 (2025), DOI: https://doi.org/10.5092/jhna.2025.17.2.9.
35. Miedema and Meijer, "Introduction of Coloured Ground."
36. Michel Hochmann, *Colorito: La Technique des Peintres Vénetiens à la Renaissance* (Turnhout: Brepols, 2015).
37. Miedema and Meijer, "Introduction of Coloured Ground," 92–93. They mention Frans Floris (1515–1570), Maarten de Vos (1532–1603), Anthony van Blocklandt (1533–1583), Dirck Barendsz (1534–1592), and Joachim de Beuckelaer (1534–1573). Joachim Beuckelaer is now known to have worked on colored grounds in his *Four Elements* from 1569 (National Gallery, London); see Lorne Campbell, *The Sixteenth Century Netherlandish Paintings with French Paintings Before 1600* (London: National Gallery, 2014), 1:108. We are grateful to Marika Spring for this reference.
38. Miedema and Meijer, "Introduction of Coloured Ground," 92–93. Here they mention Karel van Mander (1548–1606), Cornelis Ketel (1548–1616), Hendrick Goltzius (1558–1617), Cornelis Cornelisz van Haarlem (1562–1638), Abraham Bloemaert (1566–1651), and Frans Badens (1571–1618).
39. On *ordinantie,* see Thomas Puttfarken, *The Discovery of Pictorial Composition: Theories of Visual Order in Painting 1400–1800* (New Haven: Yale University Press, 2000), 14–15.
40. Miedema and Meijer, "Introduction of Coloured Ground," 93, 95.
41. Abbie Vandivere, "A Translucent Flesh-Coloured Primuersel: Intermediate Layers and Visible Underdrawing in Hieronymus Bosch's Paintings," chap. 2.2 in "From the Ground Up: Surface and Sub-Surface Effects in Fifteenth- and Sixteenth-Century Netherlandish Paintings" (PhD diss., University of Utrecht, 2013), 92.
42. Vandivere, "Translucent Flesh-Coloured Primuersel," 86–88.
43. Anne Haack Christensen et al., "*Christ Driving the Traders From the Temple*: Painting Materials and Techniques in the Context of 16th-Century Antwerp Studio Practice," in *On the Trail of Bosch and Breugel: Four Paintings United Under Cross Examination*, ed. Erma Hermens (London: Archetype, 2012), 30. Technical literature on Bruegel explains that he painted on white chalk-glue grounds, mostly overlaid with a streaky, thin, tinted *imprimatura* that plays an aesthetic role in certain cases. See Christina Currie and

Dominique Allart, *The Brueghel Phenomenon: Paintings by Pieter Breughel the Elder and Pieter Breughel the Younger with a Special Focus on Technique and Copying Practices* (Turnhout: Brepols, 2012), esp. 3:742–743. See also Elke Oberthaler, "Materials and Techniques: Observations on Pieter Bruegel's Working Method as Seen in the Vienna Paintings," in *Bruegel, the Master*, ed. Elke Oberthaler et al. (London: Thames and Hudson, 2018), 375.

44. Iris Brahms, Zwischen Licht und Schatten: Zur Tradition der Farbgrundzeichnung bis Albrecht Dürer (Paderborn: Wilhelm Fink, 2016); Iris Brahms, ed., Gezeichnete Evidentia: Zeichnungen auf kolorierten Papieren in Süd und Nord von 1400 bis 1700 (Berlin: De Gruyter, 2022). See also Nico van Hout, "Meaning and Development," 214. 44. Sixteenth-century printmakers too, experimented with colored surfaces. See Naoko Takahatake, ed., The Chiaroscuro Woodcut in Renaissance Italy (Los Angeles: Los Angeles County Museum of Art, 2018); and Nancy Bialler, Chiaroscuro Woodcuts: Hendrick Goltzius (1558–1617) and His Time (Amsterdam: Rijksmuseum, 1993).
45. Sixteenth-century printmakers too, experimented with colored surfaces. See Naoko Takahatake, ed., *The Chiaroscuro Woodcut in Renaissance Italy* (Los Angeles: Los Angeles County Museum of Art, 2018); and Nancy Bialler, *Chiaroscuro Woodcuts: Hendrick Goltzius (1558–1617) and His Time* (Amsterdam: Rijksmuseum, 1993).
46. Moorea Hall-Aquitania, "Common Grounds." See also Elmer Kolfin, "Why Colored Grounds Matter: The Evolving Research on Colored Grounds in Dutch Paintings (1580–1720)," *Journal of Historians of Netherlandish Art* 17, no. 2 (2025), DOI: https://doi.org/10.5092/jhna.2025.17.2.2, for a reflection on the art historical literature on colored grounds in seventeenth-century Dutch art.
47. For more on the dataset, see Hall-Aquitania and Van Laar, "under the microscope" in this issue.
48. Suggested earlier by Miedema and Meijer, "Introduction of Coloured Ground," 95. See also Deprouw-Augustin, "Colored Grounds in French Paintings Before 1610: A Complex Spread," Journal of Historians of Netherlandish Art 17, no. 2 (2025), DOI: https://doi.org/10.5092/jhna.2025.17.2.3.
49. Hall-Aquitania, "Common Grounds," esp. chaps. 3 (on the market) and 4 (on optical effects).
50. "Down to the Ground," *RKD Studies*, accessed November 11, 2025, https://downtotheground.rkdstudies.nl. The database will be publicly available for at least five years, with regular updates as more data on colored grounds is compiled. At publication it contains 834 paintings. See Hall-Aquitania and Van Laar, "Under the Microscope," in this issue.

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