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ALLA MANIERA: TECHNICAL ART HISTORY AND THE MEANING OF STYLE IN 15th TO 17th CENTURY PAINTING

Papers presented at the Twenty-Second Symposium for the Study of Underdrawing and Technology in Painting held online, 28-30 March 2022

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Table of Contents

Ill. 20.1. Michael Sweerts, *Peasant Family with a Man Defleaing Himself*, c. 1646-1652, oil on canvas, 66.5 x 50 cm, The Hague, Mauritshuis

20

Reconstructing Sweerts: Practical Insights into the Historical Dark Halo Technique based on Paint Reconstructions

Kirsten Derks, Markha Youchaeva, Geert Van der Snickt, Katlijne Van der Stighelen and Koen Janssens

Abstract: This paper deals with the historical dark halo technique, a painting technique often encountered in seventeenth-century painting. In his *Pictorial Museum and Optical Scale*, Palomino described that in portrait painting a dark local underpaint should be added around the sitter's head, in order to blend the contours softly. This suggests that artists used the technique to create soft lines in portraits. However, artists may have had different reasons for using the dark halo technique, such as diminishing the simultaneous contrast effect caused by strongly colored grounds. In order to gain a better understanding of this, paint reconstructions of Michael Sweerts' *Peasant Family with a Man Defleaing Himself* were carried out. One with, the other without the dark halo. This showed that by adding a dark halo in the early painting stages, it was easier for the painter to establish the right skin tones, as the dark halo served as a tonal benchmark and helped reduce the simultaneous contrast effect.

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Introduction

Making reconstructions can help in the understanding of historical painting techniques. In our 2022 article on the dark halo technique and its application in the oeuvre of Michael Sweerts, we proposed a hypothesis as to the function of the dark halo technique.[1] We argued that the dark halo technique may have been a resourceful response to optical effects challenging seventeenth-century painters, but that were only later described in modern studies of visual perception, such as the *simultaneous contrast effect* and the *crispening effect*. In the seventeenth century, artists started working from foreground to background. Fifteenth- and sixteenth-century artists generally worked from background to foreground, leaving reserves in anticipation of the main figures that were painted later. This way, artists applied plenty of colours to hold on to from the beginning: they had a tonal benchmark when painting the main figures. Adding a dark halo around the main figures in the early painting stages helped the artist to create the right tonality of skin tones, for instance in portrait painting. In the case of Michael Sweerts, he may have used this painting technique to deal with the impact of a different colour of ground when he moved from Brussels to Rome, where a warm reddish-brown preparation was preferred over the more neutral grey-over-brown ground of the Southern Netherlandish painting tradition. This strongly colored ground had a big visual impact in the early painting stage, when Sweerts applied the paint for the main figures in the composition. The dark halo helped to reduce or even diminish the simultaneous contrast effect.

This paper presents a more nuanced hypothesis as to the function of the dark halo technique in

seventeenth-century painting. Since our 2022 publication, new insights were gained, and it was found that the dark halo technique was mentioned in one historical art technological source dealing with portrait painting. Additionally, two reconstructions of Michael Sweerts' *Peasant Family with a Man Defleaing Himself* (The Hague, Mauritshuis, inv. 886)[2] were made to test our hypothesis presented in our 2022 article. More in particular, a well-chosen detail of the composition was painted: once with and once without the dark halo.[3] The goal of this hands-on experiment was to understand if the dark halos in the underpainting stage would make it easier for the artist to apply the right colours, and more specifically flesh tones, right away. The reconstructions helped in our understanding of the optical effects in the early painting stages either with or without dark halos present and gave us new insights into the possible function of the dark halo technique within the oeuvre of Michael Sweerts.

The dark halo technique and its function

Although rarely discussed in (technical) art historical literature, dark halo-like shapes are present around the main figures in a significant number of seventeenth-century Dutch, Flemish and Spanish paintings,[4] including works by Peter Paul Rubens, Jan Steen, Anthony Van Dyck, Diego Velázquez and Michael Sweerts. They can be seen with the naked eye in unfinished works, but also in finished paintings. In our 2022 article on this topic,[5] we have shown that this peculiar painting technique can be made visible with imaging techniques, such as infrared reflectography and MA-XRF scanning. In particular the latter research method has proven to be useful for revealing dark halos in the oeuvre of Michael Sweerts. Because he worked on strongly coloured grounds, infrared reflectography was not always capable of revealing the halos, while MA-XRF scanning revealed that the paint used for dark halos did not consist exclusively of carbon blacks. Halos were sometimes painted with a mixture of different pigments, including earth pigments and lead white, some of which are not responsive to IR.

In our previous study we also discussed the function of the dark halo technique.[6] Over the last thirty years, a handful of authors have proposed a hypothesis as to this function. However, none of these were entirely satisfactory. Some of these authors argued that dark halos may have been used as compositional tools, to determine the exact placement of the figures.[7] Others argued that the dark halos are actually pentimenti, mistakes covered up by the artist,[8] or a way to make the figures stand out against the background.[9]

The dark halo technique may have had a specific function in portrait painting. Since the Renaissance, the main goal of painting was mimesis.[10] Artists were mainly concerned with how to depict the world on a canvas or panel in the most convincing and life-like manner. This was also the case for portrait painting, a genre in which artists relatively often made use of the dark halo technique. A convincing and life-like portrait is dependent of several factors, such as likeness, but also skin colour and soft lines. The skill of painting live-coloured flesh was very much praised in sixteenth-, seventeenth- and eighteenth-century artistic literature.[11] Authors such as Karel van Mander (1548-1606)[12] and Gerard de Lairesse (1640-1711)[13] stressed the importance of an artist's skill to depict flesh colour. Painting skin is difficult for many reasons. Firstly, people deduct important information about a person by just looking at him/her (such as age, health, emotional state). Flaws in the skin will be easily noticed by the viewer. Secondly, skin is a very complex substance. It seems monochrome, yet it consists of many subtle nuances. The texture of skin is not smooth, but rather both soft and rough, wrinkled and even.[14] Painting live-coloured flesh was in the seventeenth century *the* way to demonstrate your skills as an artist. This is represented by the many self-portraits in which artists depicted themselves holding a palette upon which colours and ready-made grade of mixtures to paint flesh tones were displayed.[15]

The dark halo technique may have been a tool for artists to achieve the right tints for incarnates

in the early painting stages. This had already been argued by E. Hendriks in 1998, when she proposed that the technique was a way to provide '*a foil against which the tones of the portrait could be established*'.[16] Before the laying in of the background colour was started, the dark halo served as a tonal benchmark for the incarnate, which may have been the most important part of a painting.

Another important aspect of portrait painting is the use of soft and hard lines. When painting a life-like portrait, the artist needs to mimic what our eyes see: some parts of the sitter's face are in focus, while others are out of focus. The artist can differentiate between these areas with so-called hard and soft lines: areas out of focus ought to be painted with soft edges, while areas in focus need to be painted with hard lines.[17] The effect of soft lines can be achieved by blending the different patches of skin colour after application with a (dry) broad and soft brush. In sixteenth-century recipes, recommendations for soft brushes can be found, specifically for this purpose of blending or *verdrijven*. Appropriate brushes are for instance a *vispenseel* (fish brush) or a brush made of *dashaar* (badger's hair).[18] Precisely this is described by Antonio Palomino y Velasco (1655-1726) in his 1715-1724 treatise: *The Pictorial Museum and Optical Scale*.[19] In this treatise, he described how an artist should paint a portrait. One should mix all the different skin tones on the palette, starting with the darkest skin tones to delineate the face of the sitter. Using the darkest shade, the artist should apply that in all the places of that dark tint, '*spreading it just far enough to be able to blend it with the following tint*'. Again, the second tint should be applied there where it needs to go and a little bit further, in order to be able to blend it with the next. When all the skin tones are applied, the artist should take a soft brush and blend all the areas of the head, '*leaving it soft, sweet and lovely*'.[20] Then, Palomino adds an important sentence: '*It is a good idea to apply the background touching the head before the blending is done, so that the contour*[21] *of the head can be softened against it*'.[22] This sentence shows that by adding a local underpaint, i.e. the halo, directly adjacent to the sitter's face, the artist is able to blend the colours of the face well and create soft edges. As in the background in portraits is often dark in colour, the local underpaint would have a similar dark colour. This means that a dark halo is painted around the sitter's face in the early painting stages. In this context, it is important to note that this background colour mentioned by Palomino should be applied simultaneously with the skin tones, as it is needed for both paints to be wet in order to be able to blend them nicely. Interestingly, Palomino does not mention the use of dark halos for achieving the right skin tones. For him, the dark halo is solely applied to be able to blend the soft lines of the portrait.

Michael Sweerts

Michael Sweerts (1618-1664) is one of the artists who regularly employed the dark halo technique. Sweerts, born in Brussels in 1618, is known to be active in Italy and the Netherlands. Between 1646 and 1652, he was in Rome, where he was associated with the Accademia di San Luca and the *Schildersbent*. He worked for both Italian and Netherlandish patrons, including Camillo Pamphilj and the Deutz family.[23] Circa 1652, Sweerts returned to the Low Countries, where he founded his own 'Academy of life drawing'.[24] Sweerts left for Amsterdam in 1659, when he presented a self-portrait to the painters' guild of Brussels as a 'farewell gift'. In 1661, Sweerts left the Low Countries with the *Société des Missions Étrangères*. He traveled to the Near East, Palestine and further to India.

Sweerts thus worked both in Italy and in the Low Countries. Works made during his Italian sojourn are generally distinguished from his Netherlandish paintings based on the weave of the canvas as well as the ground layers used to prepare the canvas. His Italian works are generally painted on twill weave canvas prepared with a strongly coloured, reddish-brown ground, while his work dated to his Netherlandish period usually is painted on a double, grey over red ground.[25] In this

paper, one of Sweerts' works will be discussed in-depth: *Peasant Family with a Man Defleaing Himself* (ill. 20.1). This painting is generally dated to Sweerts' Italian period (1646- c. 1652).[26] This dating is based on the twill weave canvas support, which is prepared with a reddish-brown ground, both of which are typical of Italian paintings of the period. Moreover, the composition also shows clear Italian influences. The iconography of the painting shows clear associations with the *Bamboccianti*.[27]

Peasant Family with a Man Defleaing Himself shows six figures in an Italianate landscape. The dominant figures in the scene are a woman and her child, entering the picture diagonally and seen from the back. On the left side of the composition, a man is searching for fleas, a motif that is also included in other paintings by Sweerts. In the background, three additional figures are depicted, of which one is wielding a pitchfork. Around the figure of the woman, a halo-like pale shape is visible. The paint of the blue sky directly adjacent to this figure has a slightly lighter tone (ill. 20.2b). Infrared reflectography (IRR) (ill. 20.2c) revealed that a carbon rich, and thus dark, paint layer is present below the surface. This dark paint layer, or dark halo, has a grey color and consists of lead white and carbon black (most likely charcoal).[28]

Michael Sweerts and the dark halo technique

Sweerts also used the dark halo technique to create the right colours and tonality for the main figures in his *Peasant Family*. However, his reason to use this technique was different: he rather seemed to have used it to deal with a different coloured ground. The technique has only been found in his paintings attributed to his Italian sojourn (c. 1646-c. 1652), which are painted on canvas prepared with a strongly coloured, reddish-brown ground. So far, no halos have been found in his Netherlandish paintings, made on a double, grey over red ground. Thus, we suggested that Sweerts may have used the dark grey halos to deal with these differently coloured grounds, commonly used in Italy at that time. In this manner, the dark halo could have served as a solution to an optical phenomenon that was only described much later: the simultaneous contrast effect. In 1839, Michel Eugène Chevreul introduced the term *simultaneous contrast*: he demonstrated that our eye will exaggerate the difference between two colours when we look at them simultaneously.[29] The two colours appear to us as dissimilar as possible. This is a way for our brain to perceive colours better. Although the term was introduced only in the nineteenth century, sixteenth- and seventeenth-century artists must have been familiar with this optical effect too. In fact, in the introduction to his *Vite de' più eccellenti pittori, scultori e architettori*, Giorgio Vasari (1511-1574) already described the simultaneous contrast effect. In his chapter *On Colouring*, he stated the importance of using beautiful colours in the foreground, while restricting less beautiful colours to the background of the composition. He then added: '*A sallow colour makes another which is placed beside it appear the more lively and melancholy and pallid colours make those near them very cheerful and almost of a certain flaming beauty*'.[30] He expressed how colours influence each other and their appearances when placed next to each other, or in other words: he described the simultaneous contrast effect.

The concept of simultaneous contrast, although not defined as such, was thus already known to Vasari and his contemporaries. Therefore, it seems more than likely that artists in the seventeenth century must have been aware of this optical effect too. Sweerts must have known about the influence colours have on each other, either through his practical experience as an artist, his own education and/or through his interest in artistic instruction. Sweerts had a deep passion for the education of artists. Besides establishing his own drawing academy, he also published a series of prints, *Diversae facies in vsvm iuvenvm et aliorvm delineatae* (1656), which show his desire to participate in didactic culture and artistic instruction.[31] In this context, he may well be interested in and aware of theories of colour, such as the simultaneous contrast effect.[32]

Ill. 20.2. Michael Sweerts, *Peasant Family with a Man Defleaing Himself* (ill. 20.1). A: visible light. B: detail showing a shape applied with lighter paint around the mother figure (red rectangle on A). C: IRR revealing the presence of a carbon-based (thus dark) halo-like underpainting in the area of the light shape. D: MA-XRF map for PbL. E: detail (white circle on A) with a view to the underlying dark grey paint of the halo along the neck. F: paint sample (red dot on A), with three layers

As no historical texts mention dark halos as a painting technique specifically for dealing with the simultaneous contrast effect, our hypothesis remains just that – a hypothesis. The exact function of the dark halo technique in the oeuvre of Sweerts remains unclear. To learn more about the function of dark halos in the paintings by Sweerts, paint reconstructions were carried out, which helped in our understanding of the visual effect of the dark halo technique in the underpainting stage and all subsequent stages of the creative process.

Paint reconstructions as a research method

Making a reconstruction[33] of an old master's painting is not merely making a copy of said work. A copy generally imitates the surface appearance of a painting, while in making reconstructions the use of materials and layer build-up is also taken into account. This type of research – making reconstructions to answer (technical) art historical questions – has become more popular over the last years. Conservators and art historians have increasingly become aware of the value of this research

method. The earliest reported example of reconstructions, however, dates from the eighteenth century, when French art lover and connoisseur Count Caylus experimented with different methods for encaustic painting, based on historical recipes combined with results from scientific analysis.[34] Making reconstructions continued in the nineteenth century, when M.P. Merrifield and C.L. Eastlake tested the artistic working methods described in historical textual sources through reconstructions.[35] In the twentieth century, D.V. Thompson emphasized the role of craftmanship in arts in his *Materials and Techniques of Medieval Painting*. He too made reconstructions of medieval painting techniques on the basis of historical recipes and the study of paintings.[36] A few years earlier, M. Doerner published his *Materials of the Artist and their Use in Painting*, in which he brings together a vast amount of technical information on pigments, binding media and materials used by Old Masters. In this book, he also discusses the painting techniques of Jan van Eyck, Titian and Peter Paul Rubens for example. In more recent years, the interest in making reconstructions as a research tool has not dwindled. In the early 1990s, it was L. Carlyle who published groundbreaking work on reconstructions in the context of the 'Historically Accurate oil painting Reconstruction Techniques', or in short HART, research project. Carlyle placed the emphasis on sourcing materials that are deemed appropriate for the time period studied and introduced the terms *historically accurate* and *historically appropriate*.[37] The 'Impact of Oil' research project (2007-2015) employed reconstructions based on historical recipes as well as on scientific data from historical painting investigations.[38] In 2021, I. Kneepkens defended her doctoral dissertation, for which she experimented with raw and processed linseed oils and made reconstructions to understand its working properties.[39] Currently, making reconstructions is often a set part of the curriculum within universities.[40] Moreover, students are also stimulated to include reconstructions in their master's thesis research.[41] This interest in historical reconstructions also grew with the general public. A popular tv program in the Netherlands, called *Het Geheim van de Meester* ('The Master's Secret'), was broadcasted between 2016 and 2022. In this tv show, a panel of four experts work together to come as close to the technique, style and *zeitgeist* of the work of art chosen for reconstruction. Their main question is: how did the artist do it?[42]

By making reconstructions, it is possible to learn more about the way that seventeenth-century artists created their work. Through experiencing the production process of a painting from start to finish, one gains tacit knowledge, which is so important in understanding the historical working methods used by old masters. One learns about the affordances and properties of the materials, and the way these materials can be used and manipulated to create certain effects, including the limitations of the materials.[43] This knowledge complements the results of analysis and documentary research.[44] Another advantage of making reconstructions is that one may develop their skills in interpreting the scientific data used as a basis for the reconstruction. Favorably, before commencing the reconstruction process, substantial technical examinations into the original painting and/or the artist's work more generally is carried out. In that way, the endeavour can be based on the current scientific knowledge of the artwork's composition and the general working practice of the artist.

Additionally, working with historically appropriate materials is also preferred. This means that it is favoured to use materials that were available to the artist of the original work that is being reconstructed, in this case Michael Sweerts. It must be recognized that no reconstruction is ever truly historically accurate: concessions must be made based on the materials, time and expertise available. In the context of the reconstruction of Sweerts' *Peasant Family*, the exact materials used by the artist were not of paramount importance. Rather, the focus of the reconstruction was on the influence of colours on each other in the early painting stages. It was chosen to work with historically

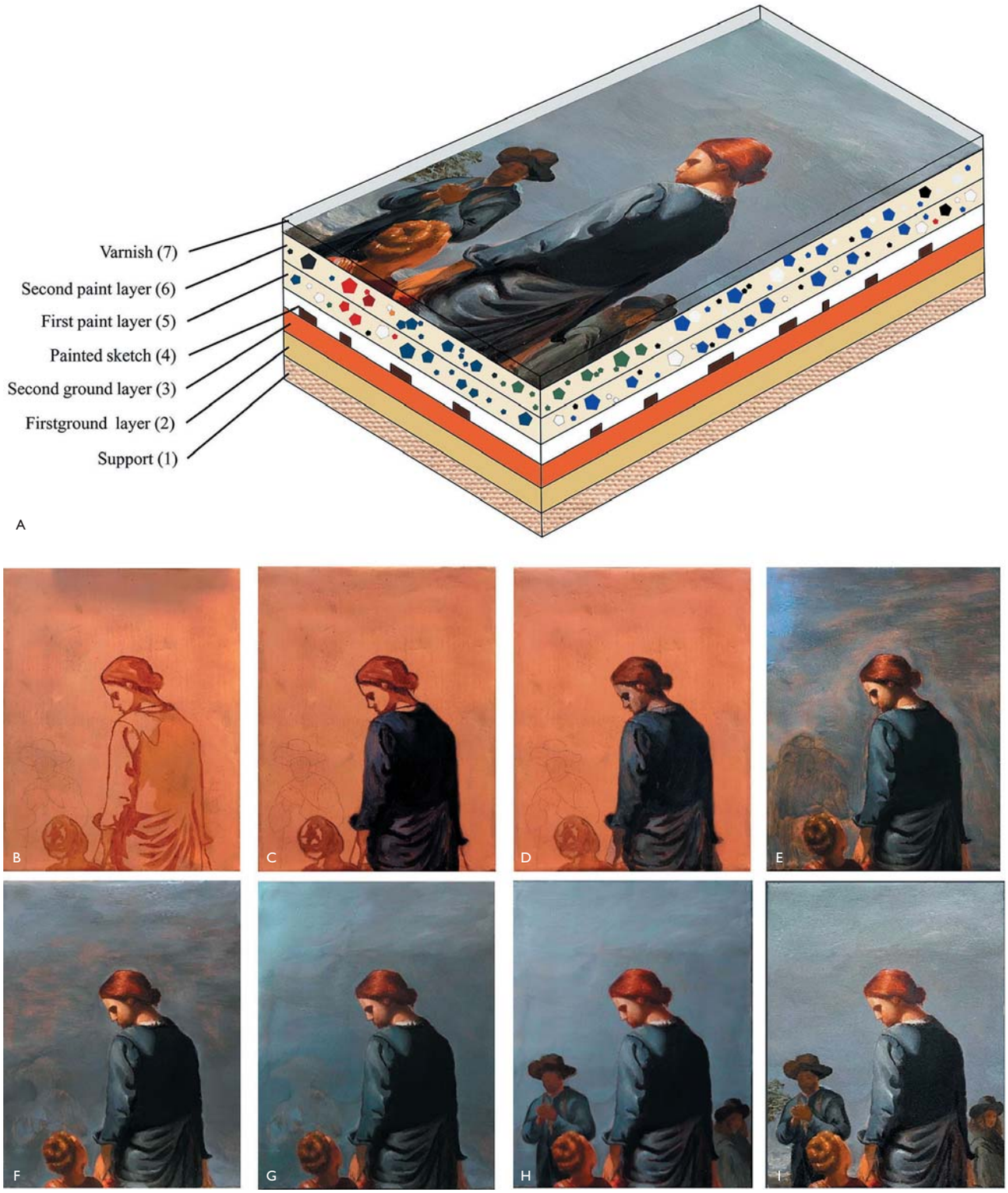
appropriate materials as much as possible, but toxic, dangerous or very rare pigments used in the original painting were replaced with a safer or more widely available alternative. For instance, lead white was replaced with 'flake white' by Blockx. This paint contains a mixture of lead white and zinc white pigments.[45] Natural ultramarine was replaced by the synthetic variant.[46]

Reconstructing Sweerts and his dark halo technique

Peasant Family with a Man Defleaing Himself was chosen as a case study for reconstructions because a wealth of technical information was at hand, as well as of availability reasons.[47] A relevant detail of the composition, that included the dark halo, was chosen to reconstruct. Two reconstructions were made of this detail: one including the dark halo, the other without. The entire process was filmed and each stage was photographed. Before the reconstruction process commenced, the painter made a copy of the detail of *Peasant Family* to get familiar with the topic, composition and the painting materials. Through this first painting exercise, the learning curve would be reduced. It was decided to work on the two reconstructions in sequence, not simultaneously: Markha Youchaeva started with the second reconstruction only when the first one was finished. This was done in order to avoid using the same paint mixtures for both reconstructions. The flesh tones as well as the colours of the figures' garments thus needed to be mixed separately for each reconstruction. This was important, as the goal of the reconstructions was to understand how the dark halo would influence the initial skin colours applied in the early painting stage, and how these skin tones appeared in the final painting. Between the completion of the first reconstruction and the commencement on the second reconstruction, a couple of weeks passed. By taking this small break, it was thought that the results of the first reconstruction would not influence the second reconstruction. Moreover, the break would also allow for Markha to start the second reconstruction with a clean slate, as she forgot about the combinations and ratios in the paint mixtures used in the first reconstruction.

First, the canvas was prepared with a double ground, of which the second, upper ground layer was reddish-brown in colour. The colour of the ground was determined after examination of the painting with a microscope and examination of cross-sections (ill. 20.2f). Sweerts' *Peasant Family* is prepared with a double ground. The first, lower ground has a more yellowish-brown colour, and probably consists of lead white, yellow earth and chalk. The second, upper ground contains mostly red earth pigments, carbon black and a little lead white. For the reconstruction, a similar build-up of the preparation layers was used: the canvas was first prepared with a ground consisting of chalk, red ochre, bone black and yellow ochre. Then a second ground, consisting of the same pigments in a different ratio was applied. For the second ground, relatively more red and yellow ochre were added to achieve the reddish-brown ground.[48] After the ground had dried, the canvas was cut up in pieces: each piece was used for one of the reconstructions. This way, it was certain that both reconstructions were made on the same colour ground. This was important, as it was thought that the dark halo would reduce the simultaneous contrast effect caused by the strongly coloured ground in the early painting stage. By using the exact same ground colour, it would be easier to determine if the halo would indeed help establishing the correct tonality of the skin tones and drapery of the figures.

The reconstruction was started with a painted sketch, using a dark brown paint (ill. 20.3). With this sketch the composition was laid out on the canvas. Then the blue garments of the woman (including the white collar) were painted, followed by her skin tones. First, the darkest shades of skin colour were applied; later continuing with the lighter shades of skin. After the mother and daughter were finished, the blue background sky was filled in, and the figures and trees in the background were painted.



Ill. 20.3. Process of the reconstruction of ill. 20.1 without dark halo. A: Schematic overview of the build-up of the reconstruction. B: First lay in of the composition using a dark brown paint. C: First painting stage, laying in the first colors of the woman's blue dress. In this stage, the darkest skin tones were applied as well. D: Working up of the skin tones and the hair. In this stage, the little girl was painted too. E: Application of the blue background sky. F: Reworking the blue sky to make it smooth. G: More reworking of the blue sky. H: The figures in the background were painted. I: The composition was finished by adding the final details in the background figures and by painting the tree

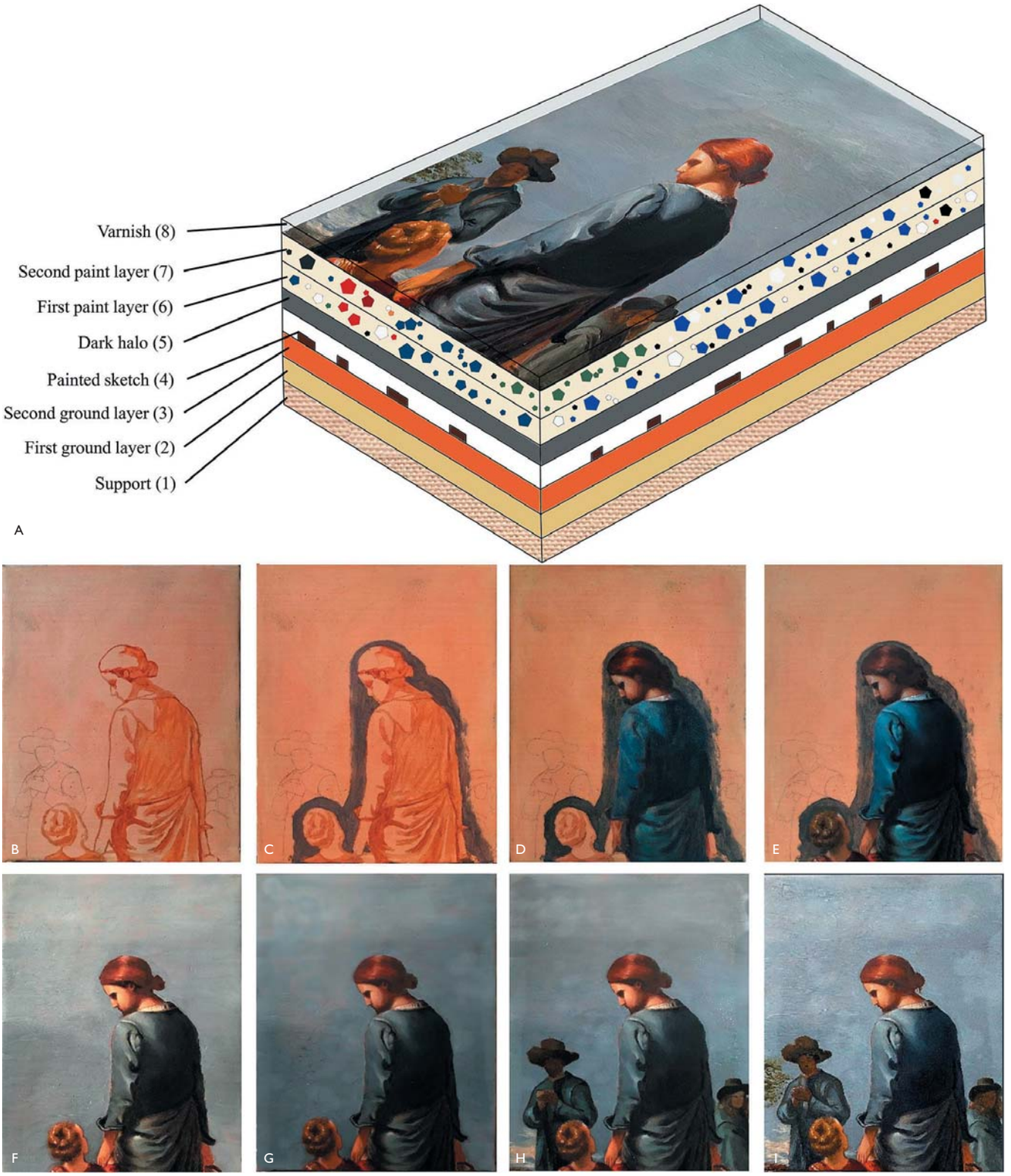
The findings of the first reconstruction – without the dark halo – were discussed immediately after its completion. During this discussion Markha Youchaeva mentioned difficulties with determining the right flesh tones and the correct blue color of the woman's dress. These difficulties were in line with our hypothesis concerning the simultaneous contrast effect: due to the strong reddish-brown colour of the ground layer, the highlights in the skin tones were initially painted too pale, while the shaded areas of skin colour were painted too dark. This was noticed after completion of the skin tones. Moreover, after the blue sky was filled in, the skin tones also appeared too orange. This too is in line with the simultaneous contrast effect: next to the reddish brown ground the skin tones seemed right, but the blue sky changed the visual appearance of the skin tones. The simultaneous contrast effects make the latter appear more orangey, as orange is the complementary colour to blue.

Although these results are based on a reconstruction made by an amateur artist, it should be noted that the simultaneous contrast effect is difficult to anticipate, even for professional artists. It is hard to imagine that seventeenth-century artists would not have difficulties with anticipating the simultaneous contrast effect of a strongly coloured ground. The darkest skin tones of the first reconstruction were slightly reworked by Markha at a later stage, when the blue sky was painted in: they were made slightly lighter. However, it should be noted that the orangey colour of the skin tones is still visible.

The second reconstruction included the dark halo technique (ill. 20.4): a mixture of carbon black and cremser white was used for the halo. This mixture was deemed appropriate as a paint sample taken near the face of the woman in Sweerts' *Peasant Family* showed that the paint used for the dark halo consists of carbon black and lead white (ill. 20.2e). The cool grey colour of the halo turned blue once applied over the reddish-brown ground. This is a common optical effect, that is again related to the simultaneous contrast effect.[49] The warm reddish-brown ground makes the cool grey appear even cooler than it is, making it seem blue in our eyes. The dark halo, even though it was dark grey in colour, seemed close to the final colour of the blue sky. This way, the dark halo serves as a good colour reference for the artist in the early painting stages. The blue sky was painted using a mixture of ultramarine blue, 'flake white', and a little vine black. The painter noted that with a halo, it was easier for her to mix paint for the dress, the skin tones and the hair of the woman with a similar tonality and hue as perceived in the original painting. The halo served as a benchmark for the darkest shades in the figure, while the white collar of the woman's dress was a reference point for the lightest shades. With these two benchmarks, the painter experienced that it was easier to achieve the right colours from the first application. This was already noted during the first painting stage, in which the skin colours were applied. Yet it should be mentioned that after the application of the blue background sky, the skin tones still appeared darker and more orangey than they did against the dark halo. The difference in appearance was significantly less, however, than in the first reconstruction without the dark halo. This corroborates that the dark halo does help with diminishing the simultaneous contrast effect caused by the strongly coloured ground layer.

Other advantages of the dark halo technique were also noticed. Firstly, it was easier to apply the paint of the background sky around the figure, as the dark halo was close in colour to the final background colour. This meant that during the application of the blue sky, the dark halo acted as a buffer or margin directly adjacent to the figures. This made it unnecessary to apply the blue paint of the sky up to the contours of the woman and child. Leaving a small strip of the dark halo exposed is not distracting, while leaving a small strip of the reddish-brown ground exposed does result in a more disturbing image.

Moreover, when applying the dark halo paint, it was possible to make small corrections to the



Ill. 20.4. Process of the reconstruction of ill. 20.1 with dark halo. A: Schematic overview of the build-up of the reconstruction. B: First lay in of the composition using a dark brown paint. C: Application of the dark halo, using a grey paint. D: First painting stage, in which the woman's blue dress and the first skin tones were applied. E: The little girl was painted. F: The blue background sky was added. G: The blue sky was reworked to make it smooth. H: The figures in the background were painted. I: The composition was finished by adding the final details in the background figures and by painting the trees.

Ill. 20.5. The two reconstructions of ill. 20.1 after completion side by side. A: without the dark halo. B: with the dark halo.

outline of the figure when needed. Small mistakes made during the painting process can be covered with a dark grey paint. Lastly, the dark halo also helped in making sharp and crisp contours. When comparing the two finished reconstructions, it was clear that the woman stood out against the blue sky in the reconstruction with the dark halo (ill. 20.5b). In the other reconstruction (ill. 20.5a), without the dark halo, the reddish-brown ground remained visible between the outline of the figure and the blue background sky, which is rather distracting. The dark halo results in a more sharply defined contour of the figure. The woman seems more 'in focus'. This latter additional advantage of the dark halo technique, may also explain why in *Peasant Family* Sweerts applied dark halos solely around the figures in the foreground, and did not add halos around the two figures in the far background (ill. 20.6). With the dark halos, Sweerts was able to draw the eye of the beholder to the mother, painted 'in focus', while the other figures are painted with less detail, making them appear further in the background. The result is more depth and sense of three dimensionality in the composition.

Conclusion

Since our 2022 article on the dark halo technique, we have gained new insights into this specific painting technique. First, in an eighteenth-century art technological manuscript, Antonio Palomino y Velasco's *Pictorial Museum and Optical Scale*, a reference to the dark halo technique was found. This is the first mention of the technique known so far. From this source, it is clear that in a portrait the (dark) halo should be added around the sitter's head to be able to blend the contours softly. Yet, as we have seen in Sweerts' *Peasant Family* and the reconstructions, the technique could also be used to create crisp contours. The dark halo technique may have had several functions. It was proposed in our 2022 article that artists may have used dark halos to serve as a benchmark to apply the right

Ill. 20.6. Detail of the woman's head. A: Reconstruction without the dark halo. B: Reconstruction with the dark halo. C: Michael Sweerts, *Peasant Family with a Man Defleaing Himself* (ill. 20.1).

colours in their compositions in the early painting stages, be it either a portrait or a different kind of composition. Sweerts may have used the dark halo technique to deal with the strongly coloured, reddish-brown ground common in Italy during the seventeenth century. For him, the dark halo technique may have been a tool to diminish the simultaneous contrast effect caused by the strongly coloured ground. In order to test this hypothesis, two reconstructions of his *Peasant Family with a Man Defleaing Himself* were carried out, one with and the other without the dark halo. It was found that by adding a dark grey halo in the underpainting stage, it was easier to establish the right skin tones, as the halo acted as a benchmark for the darkest shades in the painting. In this context, the woman's white collar also served as a benchmark for the lightest shades in the composition. The dark halo together with the white collar helped the painter to achieve the right skin tones in the early painting stages. The dark halo also had other advantages, such as making it easier to correct the contours of the figure, as well as the increased ease of applying the background sky after the figure of the woman was finished.

While it should be noted that in reconstruction-based art-technological research, a certain degree of subjectivity should always be taken into account, making reconstructions helped in our understanding of practical aspects of the seventeenth-century painting process that are rarely described in historical sources, nor in modern literature. Even though the exact function of the dark halo technique is still prone to debate, we have increased our understanding of the possible factors that were important in an artist's choice to use it.

Notes

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1 Derks *et al.* 2022.

2 Michael Sweerts, *Peasant Family with a Man Defleaing Himself*, c. 1646-1652. Oil on canvas, 66.5 x 50 cm. See also: www.mauritshuis.nl/ontdek-collectie/kunstwerken/886-boerenfamilie-met-een-een-man-die-zich-vlooit.

3 These reconstructions were made by Markha Youchaeva, in the context of her master's thesis in Conservation-Restoration at the University of Antwerp (*Reconstructies als onderzoeksmethodologie voor kunsthistorisch onderzoek: de case van de donkere halo techniek uit de zeventiende-eeuwse Vlaamse en Nederlandse schilderkunst*).

4 Dark halos can also be found in Italian painting. More on dark halos in Italian painting is discussed in-depth in Derks 2023.

5 Derks *et al.* 2022.

6 Derks *et al.* 2022.

7 Roy 1999, p. 80.

8 Wadum 1996, pp. 393-394; Lopez-Rey 2020, pp. 134, 352.

9 Van Hout, Balis 2010, p. 65.

10 Jonckheere 2020, p. 181.

11 This is explored by: Lehmann 2008; Talon 2019.

12 Van Mander 1604, fol. 49r.

13 De Lairesse 1707, Chapter 10: '*Van de Koleur der Naakten*' (pp. 35-38).

14 Lehmann 2008, p. 88.

15 Talon 2019, pp. 49-50.

16 Hendriks 1998, p. 246.

17 This is already described by Karel van Mander, see: Van Mander 1604, fol. 49r-49v.

18 Lehmann 2008, p. 96.

19 Veliz 1986, pp. 141-198.

20 Veliz 1986, p. 160.

21 The word contour is used by Palomino, meaning the outline or shape of the sitter's head. By adding a local dark underpainting around the head, the outlines of the head can be blended and softened against it.

22 Veliz 1986, p. 160.

23 Bikker 2002; Sutton 2002.

24 Yeager-Crasselt 2015.

25 Wallert, De Ridder 2002.

26 Yeager-Crasselt 2015, p. 17.

27 The *Bamboccianti* were a group of painters active in Rome from about 1625 until the end of the seventeenth century. Most of the members were Dutch or Flemish. The artists associated with this group generally created small paintings, showing everyday life of the lower classes in Rome and the Italian countryside.

28 MA-XRF scanning revealed the presence of lead in the dark halo. A cross-section taken from the area of the dark halo showed that it indeed consisted of lead white and a carbon black pigment. Based on the visual appearance of the pigment particles, the black pigment is most likely charcoal.

29 Chevreul 1855.

30 Vasari 1960, p. 219.

31 Yeager-Crasselt 2015, pp. 14, 104, 119-120.

32 Colour theory is a field of study developed in the nineteenth century. However, a few seventeenth-century texts deal with the theory of colour, such as Franciscus Aguilonius' *Opticorum Libri Sex* (or *Six Books of Optics*) of 1613 and Isaac Newton's *Opticks*. See: Aguilonius 1613; Newton 1704.

33 The term reconstruction is the term of choice in Conservation-Restoration. Other terms often used in this context are mockup, replica or reproduction. However, like a copy, replicas and reproductions often focus solely on the (final) surface appearance, while a reconstruction takes the use of appropriate materials and layer build-up into account.

34 Nadolny *et al.* 2012, p. 6.

35 Merrifield 2003.

36 Thompson 2003.

37 Carlyle 2020.

38 See: www.nwo.nl/en/projects/260-55-060. Consulted 27-09-2022.

39 Kneepkens 2021.

40 At the University of Antwerp, making reconstructions is part of the course *Techniekgeschiedenis*, taught in the second year of the bachelor program Conservation-Restoration of Cultural Heritage. At the University of Amsterdam, students in Technical Art History (part of the master's program of Conservation-Restoration) are required to take the course 'Historical Reconstructions'.

41 Youchaeva 2023; Ibrahim 2020.

42 See: www.avrotros.nl/hetgeheimvandemeester.

43 Vandivere, Pottasch, Kneepkens 2022; Ibrahim 2020.

44 Dupré *et al.* 2020; Vandivere 2013.

45 See: www.e-artstore.net/tag/1-brands/value/34-blockx.

46 Youchaeva 2023, p. 27.

47 Earlier (technical) research carried out at the Mauritshuis included examination of paint samples and cross-sections; and infrared reflectography. Technical examinations carried out in the context of a research project into the working methods of Sweerts included MA-XRF scanning, microscopic examination of the painting and additional paint sample and cross-section analysis.

48 Youchaeva 2023, p. 26.

49 This is also a colour theory taught in art school: students are taught that a painter can achieve all colours by just using black, white, red and yellow paints. This is the so-called Zorn palette. This name derives from Anders Zorn (1860-1920), a Swedish painter. It is also called the Apelles palette. A blue colour is achieved by mixing white and black. In the warm Zorn palette, the cool grey appears to be blue. This effect can be exaggerated by placing the cool grey close to more chromatic yellows and/or reds. See: Nyholm 1914. www.madridacademyofart.com/blog/zorns-palette.

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