

THE MUSEUM OF MODERN ART

The David Booth Department of Conservation

TITLE: *Lemons and Bottle of Dutch Gin*

MUSEUM No.: 722.1976

ARTIST: Henri Matisse

DATE: 1896

MEDIUM: Oil on canvas

DIMENSIONS: 11 7/8 x 12 11/16 in.

SIGNATURE: Signed and dated L.R., oil "H. Matisse. 96."

CONSERVATORS: Laura Richter Le and Anny Aviram

DATE OF TREATMENT: March-August 2024



Image 1: *Lemons and Bottle of Dutch Gin*, After Treatment

Lemons and Bottle of Dutch Gin is a work from early in Matisse's career, completed while he was training in Paris in the atelier of Gustave Moreau. It is one of several works that Matisse worked on independently at home using objects on hand. It displays a simple table setting with a pile of lemons, a white and blue vase, a bottle characteristic of Squidam (a Dutch Liquor),¹ a knife, a book, and a peach. The white tablecloth flows off the front of the table, which otherwise blends into the brown-toned background.

Matisse trained in Moreau's studio from 1892 to 1897, and during this time, he focused his attention on a series of copies of paintings at the Louvre, presumably upon Moreau's prompting to study the masters. Although Moreau himself was interested in all the "greats", from the Italian Quattrocento to the French Rococo, Matisse's copies almost entirely consisted of works from the 17th and 18th centuries.² A third of the twenty copies he made between 1893 and 1900 were still lifes.³

While *Lemons and Bottle of Dutch Gin* was likely not done in reference to any specific work at the Louvre, it reflects Matisse's interest in intimate interior settings. The objects in this work are found among other paintings Matisse worked on at home. As a couple examples, *Still Life with Peaches* (Image 2) and *Bottle of Scheidam* (Image 3) contain lemons, peaches, a glass with a spoon, a Dutch gin bottle, a knife with a white handle, and a white tablecloth that mirror the objects in *Lemons and Bottle of Dutch Gin* (see Appendix A for more still lifes Matisse completed in 1896). Many of these objects, including lemons, vases, and bottles, would also become frequently revisited subjects throughout Matisse's career. The various textures and reflective surfaces Matisse selected in his still lifes reveal the influence of Jean-Baptiste-Siméon Chardin, whose paintings Matisse regularly returned to at the Louvre, even completing at least four copies of his work (see Image 4 for a comparative work by Chardin).⁴

¹ The work was originally titled *Lemons and Bottle of Squidam*, but the name was changed in 1977 when Alicia Legg, at The Museum of Modern Art, consulted employees of the Dutch consulate, learning that the bottle resembles gin form Schiedam (brands such as Bols). She selected a general, English description, "Dutch Gin." (MoMA Painting and Sculpture Archives).

² Frank Trapp, "The Paintings of Henri Matisse: Origins and Early Development, 1890-1917," Ph.D. dissertation (Harvard University, 1952), p.15

³ Elderfield, p. 26.

⁴ Elderfield, p. 26

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Images 2: Henri Matisse, *Still Life with Peaches*, 1895, Oil on canvas, Baltimore Museum of Art; **3:** Henri Matisse, *The Bottle of Schiedam*, 1896, The Pushkin State Museum of Fine Arts; **4:** Jean-Baptiste-Siméon Chardin, *Seville Orange, Silver Goblet, Apples, Pear and Two Bottles*, 1750, private collection.

Frank Trapp writes on Matisse's series of still lifes, "the color in these works is restrained, the technique careful, though at time uncertain." About *Nature morte au couteau noir*, Trapp notes, "freedom and vigor largely compensate for its shortcoming in the definition of solid form."⁵ The same could be said for *Lemons and a Bottle of Dutch Gin*, in which the table lacks a solid presence in space. However, while many of Matisse's works from this time have muted, flat backgrounds, *Lemons and a Bottle of Dutch Gin* is unique in its dynamic background, with shapes that are not immediately recognizable forms but are executed with lively, fluid strokes. Matisse began to directly draw inspiration from the impressionist movement in 1896, and his experimentation with representation and brushwork becomes more and more prominent in his paintings during this transitional year in his career.

⁵ Trapp, 1952, p.15

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Description and Condition

The painting is executed on a plain weave canvas that now has a wax resin lining and is stretched on a metal expansion bolt stretcher. The original canvas has been trimmed to around 0.25 inches from the turnover edge. On the right edge, the canvas has begun to lift slightly from the lining.

The painting was originally purchased by the Galerie Bernheim in 1910. From there, it was displayed at the Kunstnerforbundet in Oslo, Norway from 1916 until 1961. It passed through several galleries before 1966, when it was purchased by NYC private collectors Grace and Warren Brandt. They held it in their collection before gifting it to the Museum of Modern Art in 1976 (for complete provenance details, see Appendix B). Within the donation paperwork, Grace Brandt notes that the painting had been lined, but that in her opinion, it still required inpainting in the cracks and abrasions.⁶ Presumably, the lining was done while in their collection, but she does not explicitly state so.

As it is currently stretched, the work is a non-standard size for Paris at the time and the only one of his still-lives at the time in a square format (see Appendix A). Matisse usually painted on standard-size canvases, but at times would select others to match a pre-existing drawing or painting with a ratio he wanted to preserve.⁷ Alternatively, he might have reused an originally standard-sized canvas. The possibility that there is another design, either below or on the reverse of the painting, is considered in the XRF mapping analysis (Appendix D).

There is a thick, off-white ground layer, which XRF mapping revealed to be lead white-based. Because the original canvas edges are removed, it is unknown whether the canvas was pre-primed. The paint layer is a rather thinly applied oil paint, with light impasto, especially in the upper right background. When the work entered the collection at MoMA in 1976, it looked comparable to its current appearance (Image 6). However, in a 1970 publication, *Homage to Henri Matisse*, an image of the painting appears with more luminous colors and, as a result, more clearly defined shapes (Image 5). While the photograph could have been edited for publication, including brightening and increased saturation, this likely cannot completely account for the difference in appearance. Instead, the painting has also likely darkened since the image was captured (likely not long before the publication date in 1970).



Image 5: Photograph of *Lemons and Bottle of Dutch Gin*, as seen in Di San Lazzaro, Gualtieri, *Homage to Henri Matisse: Special Issue of the XXe Siècle Review*. Tudor Pub. Co., 1970. **Image 6:** Photograph of *Lemons and Bottle of Dutch Gin* taken not long after it entered MoMA's collection, in 1980.

⁶ See P&S archives, note from Grace Brandt.

⁷ *Matisse: Paintings, Works on Paper, Sculpture, and Textiles at the Art Institute of Chicago*, Edited by Stephanie D'Alessandro, 2019, The Art Institute of Chicago. <https://www.artic.edu/digital-publications/31/matisse-at-the-art-institute-of-chicago>.

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At the start of the treatment, there was a thick, glossy varnish layer that flattened the surface and obscured details in the design (see Image 11). Anny Aviram began treating the painting in 2013 and found that the varnish layers would blanch in a variety of solvents without solubilizing. She partially removed varnish on the right half of the painting before deciding the treatment would be better suited to a more targeted treatment method at a later date. Samples of the varnish taken at the time revealed isobutyl methacrylate, MS2A, and polyurethane layers on the surface. The isobutyl methacrylate and MS2A correspond with treatments completed at MoMA (see treatment history in Appendix B), and it was assumed that the polyurethane layer below was applied prior to its acquisition.

In the 2019 catalogue *Matisse: Paintings, Works on Paper, Sculpture, and Textiles at the Art Institute of Chicago*, the materials and techniques of the ten paintings by Matisse in the Art Institute of Chicago's collection were thoroughly studied. Of those ten, works that appeared to have artist-applied overall varnishes were *Apples* (1916; cat. 24), *Woman on a Rose Divan* (1921; cat. 33), *Woman before an Aquarium* (1921–23; cat. 34), *Lemons on a Pewter Plate* (1926; cat. 39), and *Girl in Yellow and Blue with a Guitar* (1939; cat. 46). Ones with artist-applied partial varnishes included *Laurette with Cup of Coffee* (1916–17; cat. 26) and *Daisies* (1939; cat. 47).⁸ The varnishes were often mixed with oil or into the paint itself, and others not listed here had varnish applied selectively over specific design elements in the painting. At the start of the treatment, while several revarnishing campaigns had been documented, it was unknown if Matisse had originally varnished the painting and, if so, whether that varnish layer remained. Over the course of the treatment, both a melamine formaldehyde layer and a natural resin varnish layer mixed in with the paint layer, presumably by Matisse, were both discovered. Either of these might at least partially account for the darkening surface. The natural varnish, mixed in with the paint, could very easily cause a shift to warmer, darker tones with light exposure. Additionally, the MF resin likely off-gassed significant levels of formaldehyde when originally applied, and studies have shown that formaldehyde can react with a variety of pigments – including with lead white to form lead formate, which is gray in tone.⁹ A sample of the white tablecloth for example, could be analyzed for these sorts of reactions and answer whether this contributed to an overall decrease in color brightness and saturation across the work.

Treatment Summary

- 1) The upper varnish layer (at least one acrylic varnish) was removed using Nanorestore Medium Water Retention Gel loaded with Cleaning Solution G. The gel was applied for 90 min, and then the varnish peeled off with a microspatula.
- 2) The next varnish layer (a melamide formaldehyde resin) was removed by first applying Evolon with acetone over the surface, which broke up areas around the cracks. Next, the varnish was further removed using Nanorestore Peggy 5 gels loaded with Cleaning Solution G, which, when applied for 30 min, made the varnish layer brittle and easier to lift off with a microspatula. Varnish imbedded in the impasto was left (see Image 15), as it was determined that attempting to remove it might damage the paint layer. The natural resin layer below the melamide formaldehyde was left in place, both because it was only slightly soluble (as a mixture with oil) and because it is assumed to be original.
- 3) The most prominent and distracting cracks and points of abrasion were inpainted with watercolors.
- 4) The painting was varnished with Winsor & Newton Satin varnish and was buffed with a silk cloth.
- 5) The frame was cleaned with cosmetic sponges and inpainted with Qor colors.
- 6) Loose labels on the backing board were reattached with 5% methyl cellulose.
- 7) The painting was sent to the frame shop for the frame to be fitted with spacers and for the painting to be reframed.

⁸ *Matisse: Paintings, Works on Paper, Sculpture, and Textiles at the Art Institute of Chicago*, Edited by Stephanie D'Alessandro, 2019, The Art Institute of Chicago. <https://www.artic.edu/digital-publications/31/matisse-at-the-art-institute-of-chicago>.

⁹ Gerhard Eggert, and Andrea Fischer, "The Formation of Formates: A Review of Metal Formates on Heritage Objects," 2021, *Heritage Science* 9 (1): 1–13.

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Treatment Description

A variety of solvents and gels were tested, and a majority had no effect or simply blanched the varnish around the cracks without softening it (see image below). The upper layer swelled in benzyl alcohol, acetone, and toluene. An acetone/benzyl alcohol gel¹⁰ was tested, as it has successfully removed on polyurethane in the published treatments.¹¹ This gel, however, not only removed some paint, but also did not appear to fully solubilize the varnish layers, leaving a brittle, crizzled surface. It was determined to test Nanorestore gels, both in their capacity to increase the amount of time that the cleaning solution could sit and slowly soften the varnish, and also as a gel that is safer to avoid impacting the paint layer.

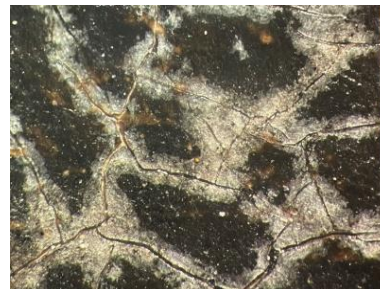


Image 7: The surface of the painting (under 20x magnification) after cleaning with solvents

Testing of the Nanorestore gels was carried out on oil painting coated with a polyurethane varnish, since at the time, it was assumed that the most challenging varnish layer to remove was the polyurethane identified in 2013. Nanorestore Cleaning Solution G was selected as it has also been used successfully on polyurethane coatings.¹² Cleaning Solution S and Apolar Cleaning Solution were also tested. Additionally, both Medium Water Retention (MWR) and the Peggy 5 gel were tested. Cleaning Solution G removed all of the coating, and Cleaning Solution S removed some of it. The Peggy 5 gel worked more quickly than the MWR gel.

When testing on the painting, only Cleaning Solution G was effective (Cleaning Solution S had no observable effect), and rather than the Peggy gel, the MWR produced better results. The difference in gel results is assumed to be because the sample had more impasto than the painting itself, especially on this upper layer, where the thick varnish had created a very flat surface. Also, whereas on the sample it took approximately 30 min for the polyurethane varnish to lift, on the painting it took around 60-90 min for the varnish to soften enough to easily remove. At this point, it peeled off with very minimal mechanical action. The varnish was removed in around 1.5 x 1.5 in squares of gel, peeling off the gel with a microspatula and cleaning after each time. With this round of cleaning, a significant decrease in gloss was observed across the painting (see Images 12 and 14). However, while working, UV light revealed that there was still at least one varnish layer remaining, which fluoresced a bright blue. A sample of both the upper and lower varnish layers were taken at this stage for analysis.

A preliminary test on the remaining varnish layer revealed that it did not soften with gel application, even over several hours, but merely became more brittle. FTIR analysis revealed that the upper layer, now successfully removed, was an acrylic resin, which aligns with treatments carried out at MoMA (for a list of varnishes applied in past treatments, see Appendix C). The insoluble layer below was identified as melamine formaldehyde (MF) resin analyzed (see Appendix D for spectra of both layers). This layer was likely the source of the urea peak previously identified as polyurethane. As a "complex, interlinked polymer that cures to a clear, hard, chemically resistant resin, melamine formaldehyde is employed in plywood and particleboard adhesives, laminated countertops and tabletops, dishwasher-safe tableware, and automotive surface coatings."¹³ Additional research confirmed that melamine formaldehyde would be even more solvent-resistant and stronger than polyurethane.

¹⁰ 1.5 g Carbopol, 8 mL Ethomeen C-25, 200 mL acetone, 50 mL benzyl alcohol, and 25 mL water (recipe first published in Wolbers 1988: B6)

¹¹ Dusan Stulik and Valerie Dorge, *Solvent Gels for the Cleaning of Works of Art: The Residue Question* (The Getty Conservation Institute, 2004), p. 11.

¹² Nabil Mabrouk, *Experimental and applied study on the removal of polyurethane adhesive from the archaeological textiles*, Damietta University, https://mjaf.journals.ekb.eg/article_137010_cd5459f511d2f0262f9906311d00fbb7.pdf.

¹³ Britannica, The Editors of Encyclopaedia. "Melamine-formaldehyde resin". *Encyclopedia Britannica*, 1 Mar. 2018, <https://www.britannica.com/technology/melamine-formaldehyde-resin>. Accessed 30 August 2024.

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Mechanical removal was attempted but was extremely slow. In the small areas where the MF resin was removed, a final varnish layer was noted, fluorescing green under UV (as is characteristic of a natural resin varnish) and appearing to be applied in uneven brushstrokes that aligned with the paint strokes below. This was also sampled and analyzed (see Appendix D for spectra). Analysis indicated both the presence of a natural resin varnish, but also of oil medium and an aluminosilicate, viridian, and Prussian blue mixed into the sample, indicating that some paint is also present in the sample. As noted in the description, Matisse is known to have applied a natural varnish over several other of his works, often mixing the varnish medium with oil or into the paint itself, which is consistent with how Matisse appears to be applying the natural resin varnish into the paint layer on *Lemons and Bottle of Dutch Gin*. This varnish layer swelled but did not lift in acetone. As a result, Evolon fabric,¹⁴ soaked in acetone, was placed over the painting in around 2 x 2 in sections. This removed the inpainting from the cracks and abrasions, which appeared to primarily have been applied under the acrylic varnish layer and on the MF resin. It also succeeded in slightly lifting and embrittling the MF resin around the cracks. However, the resin proved to be still too hard to remove mechanically without risking abrasion to the paint surface.



Image 8: Evolon after sitting for 1 min on the painting surface. Lines of inpainting are clearly visible.

While the gel was applied in uniform squares, since the edges did not create a visible line on the paint surface, the Evolon was cut to match drying cracks on the painting, as it did shift the gloss levels of the painting and leave a visible edge after application.

For the final step in the varnish removal, Peggy 5 gels ended up being the most effective solution tested. When soaked in Cleaning Solution G, they were able to further break down the MF resin enough to remove a suitable amount to dramatically decrease the glossiness of the surface. Peggy 5 gels were likely more effective at this stage due to their ability to conform into the cracks and uneven surface, especially in comparison to the initial cleaning stages. When removing the upper acrylic layers, leaving the gel for an entire 90 min made it softer and even more easily removable. On the other hand, anything beyond 30 min of applying the Peggy 5 gel, the MF resin did not appear to break down any farther (even after several hours). See Images 9 and 10 for a comparison in the gel consistency as it was removed – the acrylic layers peeled off effortlessly in a thick layer, while the MR resin crumbled into small flakes. UV illumination revealed that there was MF resin remaining in recesses in the impasto, but any treatment methods for removing these fragments were deemed too invasive. Additionally, in small tests, removing these islands of MF varnish did not appear to visibly improve or alter the appearance of the painting.



Image 9: Removing the acrylic varnish layers after applying a MWR gel in Cleaning Solution G.



Image 10: Removing the melamine formaldehyde resin after applying a Peggy 5 gel in Cleaning Solution G.

¹⁴ A microfilament absorptive fabric.

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The most prominent, distracting cracks and areas of abrasion were inpainted with watercolors. Less inpainting was added than had been removed, leaving the drying cracks slightly more apparent. Finally, although the natural resin layer remained, the painting now looked dry and desaturated. Winsor and Newton satin varnish, as well as a combination of Winsor & Newton glossy and matte varnishes, were tested on the left edge of the painting. The satin varnish provided slightly better sheen and saturation. The painting was thinly brush varnished with satin varnish and buffed with a silk cloth.

The original backing board was kept, as it was in good condition apart for some lifting labels, which were set down with 5% methyl cellulose. The frame is gilded and does not match the frame in the photograph taken after MoMA acquired the work (Image 6). Presumably, the frame was added while in MoMA's collection. The embedded dirt was cleaned with cosmetic sponges, and small cracks and chips exposing the ground layer were inpainted with Qor colors. The frame rabbet had exposed and rough wood, and the painting did not snugly fit, with around half an inch of space around the edges. The work was sent to the frame shop for spacers and felt to be added and for the painting to be reframed.

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Before Treatment



Image 11: Before Treatment Showing the Thick Varnish Layers, Natural Light (Left), Oblique Specular Light (Center), and Ultraviolet Light (Right)

The varnish layer was so thick and flat that it obscured details in the painting. The gin bottle (the black one on the right) was barely distinguishable, if at all. The varied brushwork and color tones in the background were likewise challenging to appreciate.

During Treatment:



Image 12: Removing Gel with Nanorestore Cleaning Solution G and medium water retention – chemical hydrogel.

The gels were applied from the upper left corner and moving down and to the right. At the start of cleaning, $\frac{1}{2}$ to $\frac{3}{4}$ inch squared of gel were used, but as the treatment progressed, 2 x 2 inch gel squares were used, as it allowed for faster and more uniform cleaning. Because the gel peeled off in a single layer, the edges of the squares did not appear to leave any visible lines on the painting.

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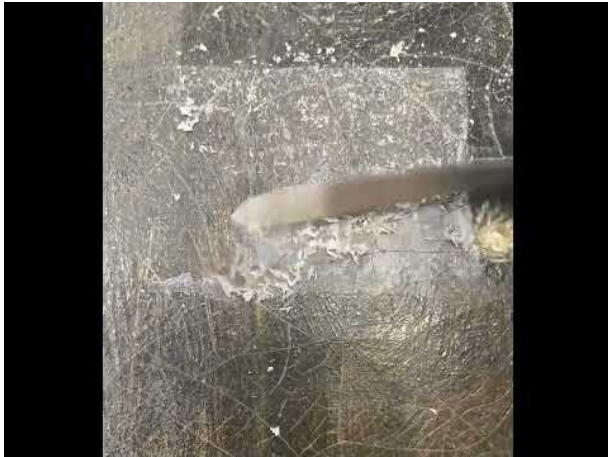


Image 13: Time Lapse Video: Removing Varnish after Gel Application¹⁵

The MR resin layer required more mechanical action with the spatula, but the paint layer appeared unaffected when analyzed under the microscope. The natural resin layer likely provided a protective barrier that aided this cleaning process.



Image 14: Treatment Progression, Varnish Removal

¹⁵ Unlisted Video on YouTube that can be accessed via this link: <https://youtu.be/MSeYl9BHjUI?si=p5TvsgdQoGizX2m>.

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Image 15: During Treatment, After Cleaning, Natural Light (Left) and Ultraviolet Light (Right)

When cleaning was halted, the paint appeared slightly dry and blanched. Additionally, after the inpainting in the cracks and abrasions had been removed, these appeared much more prominent.

Under UV light, the natural varnish layer (greenish in color) is visible across the entire surface. Additionally, small lines of MF resin in the recesses of impasto are seen (fluorescing a bright blue color).

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After Treatment



Image 16: After Treatment, Natural Light (Left) and Oblique Specular Light (Right)



Image 17: After Treatment, Frame (Left) and Framed Painting (Right)

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Technical Imaging

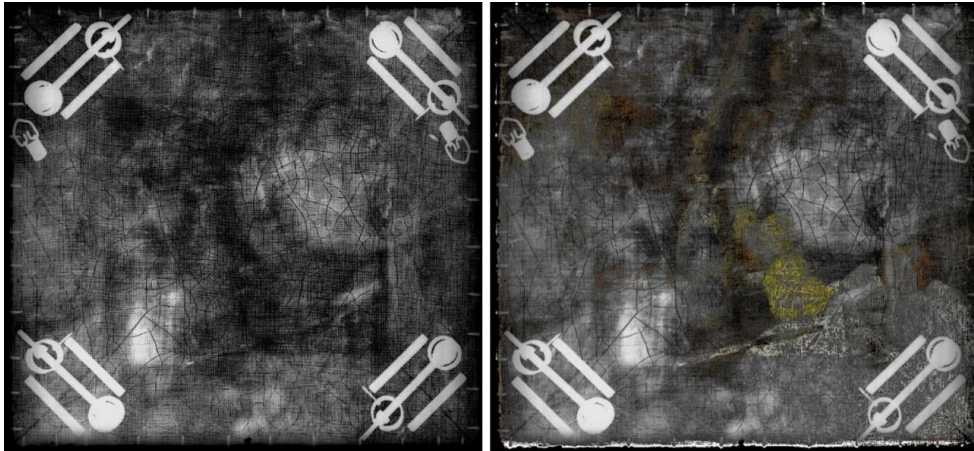


Image 18: X-radiograph (Left), and X-radiograph overlaid onto photograph of the painting (Right)

The X-ray image revealed a patchy pattern that did not clearly correspond to objects in the image. Neither the lead white tablecloth nor the lead white vase appears white in the image, so as a result, there must be more thickly applied heavy materials elsewhere. There is a lead white ground (see XRF mapping), and if it were applied unevenly, this could account for the patchy surface. As another possible explanation, the XRF map of zinc, mercury, and manganese revealed a pattern that also did not match the surface design (specifically zinc in some areas resembles the areas of density seen in the X-ray above, but not perfectly). If there were another design under or on the reverse of the canvas, this could account for these elements (see XRF mapping in Appendix D).



Image 19: Infrared Photograph

Infrared photography did not reveal any additional information. Infrared reflectography might penetrate deeper into the paint surface and reveal more information on underdrawings or other layers.

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A: COMPARATIVE STILL LIFE PAINTINGS BY MATISSE IN 1896



The Bottle of Schiedam, 1896, The Pushkin State Museum of Fine Arts



Nature morte a la bouteille de Scheidam, 1896, Musée départemental Matisse, Le Cateau-Cambresis



Nature morte au couteau noir, 1896, Musée cantonal des Beaux-Arts de Lausanne



Still Life with Black Knives, 1896, Private Collection



Still Life with Grapes, 1896, Private Collection



Still Life with Self Portrait, 1896, Columbus Museum of Art



Still Life with Two Bottles, 1896, Private Collection



Still Life with Fruit and Bottles, 1896, Private Collection



Still Life with Pitcher, ca. 1896, MuMa Le Havre

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APPENDIX B: PROVENANCE

As provided by MoMA's Provenance Research Project¹⁶

Jules Saulnier

1910 Galerie Bernheim, Paris (Purchased from Saulnier. Guy-Patrice and Michel Dauberville, Henri Matisse chez Bernheim-Jeune, Paris: Bernheim-Jeune, 1995, vol. 1, no. 6)

1916 Kunstnerforbundet, Oslo, Norway (Purchased from Bernheim-Jeune. Per *ibid.*)

Lennart Heijne, Stockholm (As of 1954. Per back label: Exhibition: Cézanne Till Picasso at Liljevalchs Konsthall)

1961 Palais Galliera, Paris, (Auction March 13, 1961)

1965 Sotheby's London (Auction March 31, 1965, lot 96)

1965 Richard Feigen Gallery, New York (Purchased at the above sale)

1966 Grace and Warren Brandt, New York (Purchased from the above. Per MoMA Master Collection File)

1976 The Museum of Modern Art, New York. Gift of Grace and Warren Brandt

APPENDIX C: TREATMENT HISTORY

1976: Grace and Warren Brandt, when offering the gift to MoMA, noted that the painting had been lined but still required inpainting in the cracks and abrasions.¹⁷ Presumably, this work was done while it was in their collection.

1977: A tinted brownish-green varnish was noted -- applied to the surface to hide cracks that had opened, exposing the ground. The varnish was removed and the painting brushed with Acryloid B 67 to eliminate blanching, and cracks were inpainted with Magna colors with AW2 and Stand oil. A solution of 7.8% Polyvinyl acetate (AYAA) was sprayed on the surface, along with a top coat of Acryloid B 67.

1991: Since the varnish layers were slightly opaque, a thin coat of Arkon P-90 hydrocarbon resin in mineral spirits was brushed on.

2013: Anny Aviram began treatment, partially removing varnish on the right half of the painting. She stopped when the varnish failed to fully solubilize and decided to postpone treatment until a safer/more effective treatment method could be devised. Chris McGlinchey sampled the varnish layers and found isobutyl methacrylate and MS2A in glossy passages, as well as polyurethane in other areas that remained insoluble in testing.

¹⁶ <https://www.moma.org/collection/provenance/?locale=en>.

¹⁷ See P&S archives, note from Grace Brandt.

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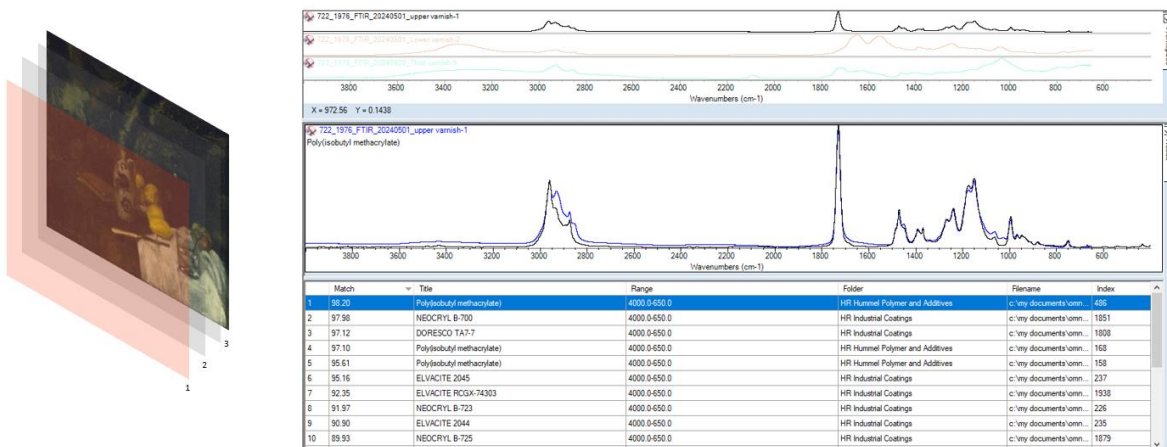
APPENDIX D: SCIENTIFIC ANALYSIS

Analysis, Images, and Interpretation by Abed Haddad

Varnish ID with FTIR:



Sampling Locations: Varnish ID was accomplished for all three layers of varnish previously applied to the work (**u-FTIR**: Nicolet iS50-FTIR coupled with a Thermo Nicolet Continuum infrared microscope equipped with an MCT-A detector; 128 scan 4cm^{-1} resolution).



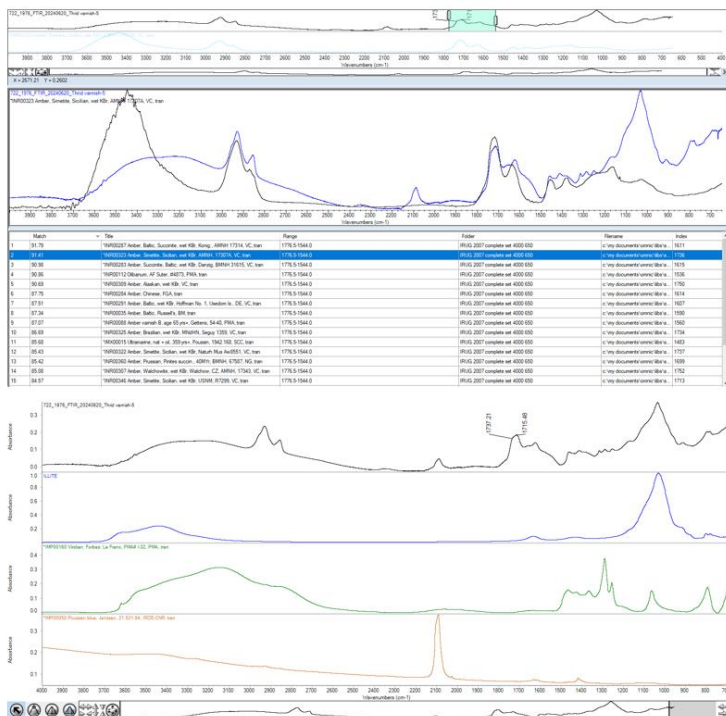
The first layer was identified as an acrylate, and the FTIR spectra suggests butyl-methacrylate resin. This corresponds with the 1977 treatment, during which the painting was brushed with Acryloid B67, an isobutyl methacrylate resin.

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The second layer of varnish was identified as a melamine-formaldehyde resin, which was applied before the painting entered the MoMA collection in 1976, potentially while in Grace and Warren Brandt's collection and at the same time that it was wax-resin lined.

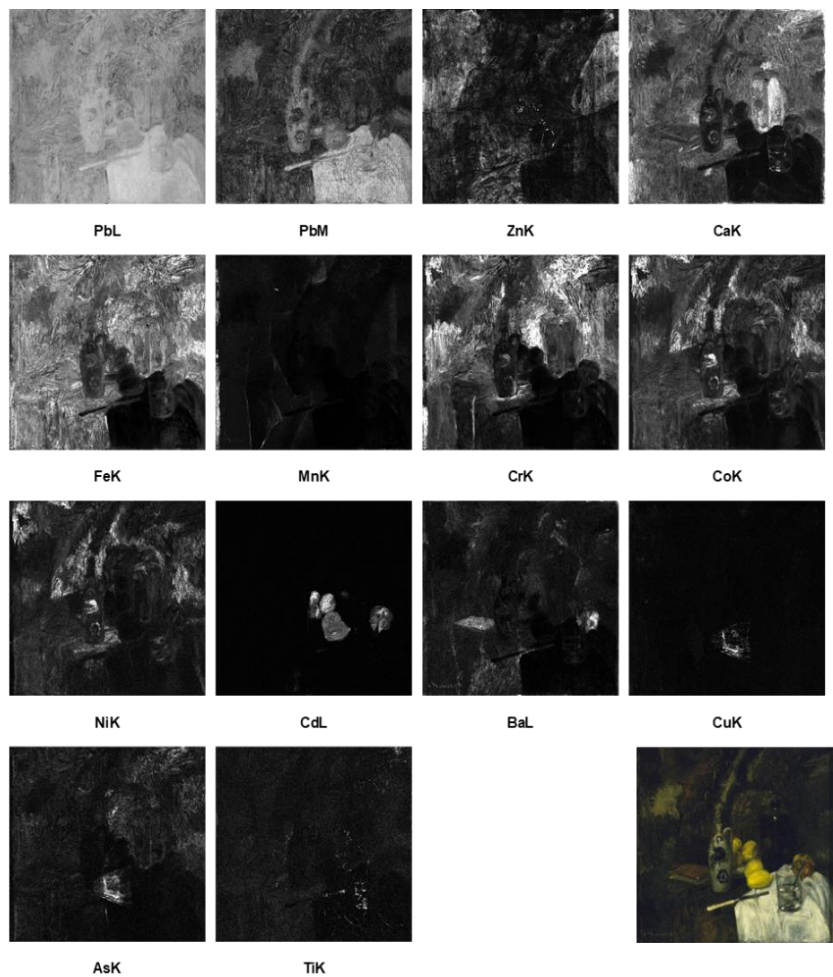


The spectrum of the third layer indicates the presence of a natural resin varnish. Matisse was known to have integrated natural resins into his paint media, so whether the resin is applied on top of the paint or integrated into it could be answered in the future with a cross-section. The presence of an aluminosilicate, viridian, and Prussian blue indicates that some paint media is also present in the sample, which again precludes firm identification of a varnish layer or integrated varnish. However, the shoulder at 1737 cm⁻¹ suggests the presence of the oil medium in this sample. As discussed in the description, this layer is very likely added by Matisse himself.

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Pigment ID with X-ray Mapping:

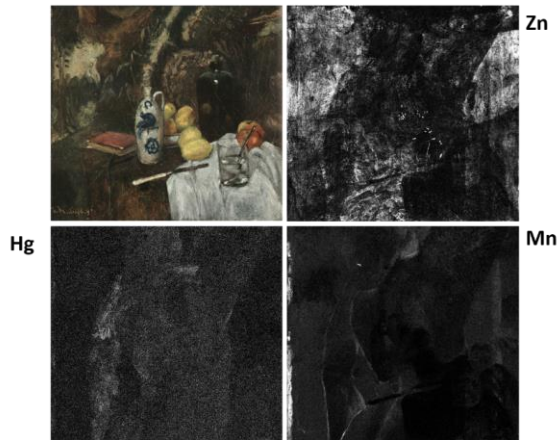


Overall, the palette identified by XRF scanning includes:

- Lead white (Pb) ground
- Lead white paint (Pb-M)
- Zn white?
- Bone black
- Chromium oxide-based green (perhaps viridian as observed in FTIR)
- Earth Pigments (Fe, [Fe, Mn= Umber])
- Cobalt blue (Co, Ni)
- Cadmium yellow (Cd)
- Barium and calcium fillers
- Titanium white retouching

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The maps for Zn, Hg, and Mn reveal certain elements that could perhaps signal the presence of an underlying composition or composition on the reverse of the original canvas. However, a longer and higher-definition scan would be required to obtain more information. Since Matisse was working at home as practice and only in this year sold his first still life painting, he could easily have been reusing canvases. Additionally, as discussed previously, the canvas is not a standard size, also indicating that it might have been re-worked. To answer if there is another composition hidden below would require further analysis, including acquiring cross sections, a longer X-ray scan, and potentially an Infrared Reflectogram.