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H-France Review Vol. 20 (August 2020), No. 155

Ella Hendriks and Marije Vellekoop, *Van Gogh's Sunflowers Illuminated: Art Meets Science*. Amsterdam: Van Gogh Museum and Amsterdam University Press, 2019. vii + 256 pp. Bibliography, abstracts, index, and note to the reader. € 55.00. (hb). ISBN: 9789463725323.

Reviewed by Christa DiMarco, The University of the Arts.

From about 1880 to 1890, Vincent van Gogh generated more than 800 paintings and 1000 works on paper, imagery that has captivated the attention of scholars for more than a century. Art historians who study Van Gogh often connect artistic influences to his paintings or revive the mythical narrative of the painter's life. These methods remain an unwavering core of the historiography. However, the conservation efforts undertaken at the Van Gogh Museum and recently published in *Van Gogh's Sunflowers Illuminated: Art Meets Science* offer a new direction. Through an extensive analysis of the painter's 1889 *Sunflowers* located in the Van Gogh Museum collection, a team of interdisciplinary researchers led by Ella Hendriks (Professor and Chair of Conservation and Restoration of Moveable Cultural Heritage at the University of Amsterdam and former Senior Paintings Conservator at the Van Gogh Museum) and Marije Vellekoop (the Van Gogh Museum's Head of Collections, Research, and Presentation) use scientific methods to raise questions about Van Gogh's unique treatment of materials. What, for example, can a scientific study of medium teach us about the artist's practice? How does a precise understanding of materiality inform the art-historical narrative? And, more pressing, how can conservators protect Van Gogh's paintings as they age?

*Van Gogh's Sunflowers Illuminated* builds on a long-term project. In the 1990s, conservators compared micro-paint samples from two of Van Gogh's large sunflower paintings, one housed in the National Gallery in London and the second in the Van Gogh Museum.[1] In 2005, the Van Gogh's Studio Practice Project was founded to take on projects of a broader scope, which led to the publication of *Van Gogh's Studio Practice* in 2013 and the compendium exhibition catalog *Van Gogh at Work* in 2015.[2] These landmark studies, both edited by Vellekoop with contributions by Hendriks and others, establish how to analyze the artist's use of materials and why an understanding of artistic practice can effectively push the scholarly conversation beyond the all-too-familiar biographical exploration of the artist's life. In *Van Gogh at Work*, for instance, Vellekoop addresses the intersection of subject matter, medium, and materials. Trace pencil and charcoal lines reveal that Van Gogh made use of perspectival frames to help draft a convincing sense of depth and they point out when he abandoned the practice. The team also shows how Van Gogh diverged from the Neo-Impressionist painters with whom he was enamored, as well as pinpoints when new ready-made pigments in saturated hues—like cadmium yellow and cobalt blue—appear on his palette. These findings emphasize Van Gogh's pictorial autonomy and

undermine the overwrought narrative of the artist as a receptacle, emulating rather than innovating amid the modernist ideas swirling around him.

Unlike the two previous tomes, *Van Gogh's Sunflowers Illuminated* explores just one painting: the 1889 *Sunflowers*. Hendriks, Vellekoop, and more than thirty conservators, museum directors, and art historians use new, non-invasive conservation methods to tell two stories: one of artistic process, and a second of the life of the canvas. They depend on in-situ analysis made possible through a portable Mobile Laboratory (MOLAB) with instruments capable of macro X-ray fluorescence (MA-XRF), macro X-ray diffraction (MA-XRPD), reflection and Raman spectroscopies (FTIR), and more.[3] For those new to reading detailed conservation results that employ scientific methods, Hendriks and Vellekoop offer a comprehensive guide to understanding the process. The text is an accessible teaching tool, fostering a reading experience akin to that of the classroom where aspects of a project are placed in clear relation to one another so that a total picture emerges. Throughout the study, complex, data-driven maps, charts, and cross-sections abound, but they are effectively labeled, color-coded, and accompanied by a thorough glossary. The book's visual aids offer a valuable record of the experiments and guide readers through its complex discoveries.

Since the non-invasive methods employed by the team do not require contact with the object, as does paint sampling, they yield exciting results in determining the order Van Gogh painted canvases and their conservation history. For example, we learn how Van Gogh cut pieces from a roll of canvas by mapping the warp and weft of Tasset et L'Hôte's pre-primed canvas, a favored brand of Van Gogh's. In doing so, the researchers establish which paintings he generated in a five-month span around the making of *Sunflowers*. In terms of color, for instance, the canvas appears as a study of yellow-orange, a clear-cut monochromatic image. But they find a "variety of color nuances intended by Van Gogh," and that the effect is in fact a result of the chemical deterioration of hue further flattened by a yellowed varnish (p. 113). On the history of the canvas, dark soot-like particles sealed in varnish suggest the painting's placement above the fireplace of Jo van Gogh-Bonger, the artist's brother Theo's wife. And while this may seem like a subtle biographical point, it indicates when *Sunflowers* was varnished because Jo, who was the first steward of Van Gogh's work, was adamantly opposed to varnishing her brother-in-law's paintings. Moreover, the ability to acknowledge the presence of varnish and beeswax confirms that Jan Cornelis Traas' conservation efforts began in 1927, just two years after Jo's 1925 death, and not in 1901 as had been previously thought, due to a confusion between the London and Amsterdam *Sunflowers*.

These examples show the value of scientific approaches to art. The core of the book, however, addresses how the chemical changes to the canvas can help us refine our understanding of the historiography of the *Sunflowers*. A chapter summary can clarify the approach the researchers take. The first few chapters focus on art history and artistic method and later chapters turn to conservation history and findings. After a brief overview of their research in chapter one, the story of how the *Sunflowers* came to be is revisited in chapter two by Nienke Bakker and Christopher Riopelle. Having left Paris in the winter of 1888, Van Gogh arrived in the southern, Provençal town of Arles where his output rivaled the energetic frenzy found on his canvases. Van Gogh longed for intellectual companionship and invited Paul Gauguin to join him in the "studio in the south," as he called it.[4] Before Gauguin's October arrival, Van Gogh set about to ready the Yellow House, a rented home he hoped would serve as a hub of artistic energy. To cheer up the small abode, he painted several large-scale *Sunflowers* and hung two in Gauguin's room. One

of these paintings is in the collection of the National Gallery in London. Although Gauguin left in December amid the turmoil of Van Gogh severing part of his ear, Van Gogh took up the subject of the sunflowers again in late 1888 and early 1889 and made three repetitions, one of which is the Amsterdam *Sunflowers*. These iconic paintings represent a pivotal moment in his career as we see the artist's signature interplay between saturated hue, inconsistent impasto mark-making, and symbolic form take shape—evident among the impossibly large blooms atop animated stems. Bakker and Riopelle establish that the paintings “signified...bold and uncompromising declarations of experimental intent and independence,” despite the fact that Van Gogh saw Gauguin as the leader of the new directions in which their respective practices were headed (p. 27). Bakker and Riopelle's point erodes a steadfast vein of the scholarly narrative: an overemphasis of Gauguin's influence on Van Gogh, as if the former is responsible for Van Gogh's shift to bright, enigmatic canvases.

Although Bakker and Riopelle do not rely on non-invasive methods, in chapters three and four Hendriks, Vellekoop, and their team apply their new techniques to show how Van Gogh sought an innovative practice prior to and after Gauguin's stay in Arles. As a result, they uncover the stages of both the London and Amsterdam *Sunflowers*, which will be of particular interest to scholars who explore the process of painting. Readers will be intrigued by the comparison between the two repetitions because it not only shows how Van Gogh constructed the canvases, but how his practice grew in a few months' time. Too often, scholars focus on how the *finished* work fits into the art-historical narrative, but knowing how the artist made color choices, sketched, and revised his two seemingly identical compositions informs our understanding of the work as an object in the act of becoming. Since Van Gogh's surfaces are heavy with thick paint, his initial stages are difficult to assess with the naked eye. The scanning methods implemented reveal the step-by-step application of charcoal or paint onto the primed canvas. First, in both the London and Amsterdam canvases, color is obviously paramount. For the London canvas, the team uses MA-XRF scanning to note three shades of chrome-yellow, hues that could not be confirmed through the artist's letters. They also record to what degree the artist used the chrome-yellow variants and how he imaginatively combined emerald and viridian green, among other colors, even though the latter is slightly covered. In the Amsterdam canvas, they find “a more abstract effect” (p. 115). There is a wider range of hue and the rapidity with which Van Gogh made his strokes is evident. Details such as delicate striations, robust swirls, or gestural hatch marks show how Van Gogh intentionally controlled his medium and made inventive use of his tools. In the London *Sunflowers*, sketch lines of charcoal and a dark red pigment called “geranium lake”, as well as viridian were found. In the Amsterdam *Sunflowers*, the artist seems to have modified his reliance on the sketch and focused on a complicated method of layering paint. Although sketched in parts of the painting, some areas reveal that he used the same color to merge the initial sketch-like strokes with the layers of paint. This may seem a fine point, but when understanding Van Gogh's painting practice as self-directed innovation, the artist's choice to blend the sketch with the broader strokes of the subject suggests a consideration of the process as a recognized part of the whole. The stages, in other words, have become the surface.

Hendriks and Vellekoop do not treat the painting as a static object—a play of color and form preserved since 1889—but as a moveable object with a changing chemical and material form, one whose protective care can serve as a model for the conservation of modern work. Curators and museum directors will thus find chapters five, six, and seven most useful. In particular, the studies of museum lighting effects on color register alarming findings and call for an immediate need to reconsider museum standards for lighting modern works. In chapter five, a team led by Letizia

Monico and Hendriks assess the aging of geranium lake and chrome yellows, pigments Van Gogh used in *Sunflowers*. They find that geranium lake is deteriorating, though not rapidly, and that chrome yellow is darkening. Both chemical processes create a less vivid image, and they underscore that it is difficult from observation alone to understand the complexity of Van Gogh's color use. The vivid color charts and graphs the researchers include show the magnitude of these changes. To this end, they recommend specific lighting environments and challenge current museum-lighting policies such as the "focu[s]" on the elimination of UV and IR radiation and on keeping illuminance and annual exposures below critical values" (p. 149). Instead, chapter seven suggests a shift to a use of warm white LED lights with limited light exposure to impede color change (p. 200). Although chrome yellow inevitably changes, the team argues that it can be minimized if properly monitored. In chapters six and seven, Klaas Jan van den Berg, Hendriks, Muriel Geldof, and others, propose a clear approach to contemporary conservation efforts. Experts cannot return a painting to its original state. For *Sunflowers*, a history of varnish, which cannot be removed, and exposure to light have caused irreversible alterations. The principle aims of the conservator should therefore be to slow the inevitable evolution of a paint surface and become "managers of change" (p. 193). The goal of maintaining a canvas as it was when completed is untenable. Rather, digital imaging, non-invasive experiments, and lighting policies can show what the image looked like, how changes affect the surface, and how they can mediate the hazards of the museum environment.

*Van Gogh's Sunflowers Illuminated* will undoubtedly be useful to Van Gogh scholars. It helps us perceive Van Gogh as an artist with agency, as opposed to a painter in a state of manic production. Even art historians who do not work on Van Gogh will discover the value of consulting conservation records, if extant. Scholars who theorize on the roots and implications of modernist paintings will want to go beyond surface observation when considering how artists use materials to execute their work. In addition, museum leaders will find rich evidence and new scientific methods to preserve the dignity of the canvases under their care. What these methods ultimately teach us is that conservation is not just a matter of knowing about hue, but more about the decision-making process and the ways in which the artist commanded the materiality of the canvas. For Van Gogh, it became an experimental dialog among color, composition, and medium, pictorial aspects he concertedly orchestrated. Through an insatiable curiosity about materiality, Hendriks, Vellekoop, and their team merge science and art history to generate a narrative that is compelling and unequivocally grounded in the changing nature of Van Gogh's *Sunflowers*.

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## NOTES

[1] Over the course of his painting career, Van Gogh dedicated eleven canvases to the subject of sunflowers. Of these, he made five large canvases of flowers set in an earthenware vase against either a monochromatic yellow or blue background, and he executed these in 1888 and 1889. Three of the five large canvases are referred to as repetitions.

[2] Marije Vellekoop, ed. *Van Gogh's Studio Practice* (Brussels and Amsterdam: Mercatorfonds and the Van Gogh Museum, 2013) and Vellekoop, ed. *Van Gogh at Work* (Brussels and Amsterdam: Mercatorfonds and the Van Gogh Museum, 2015).

[3] For a comprehensive and user-friendly list of conservation approaches, see: “Research Methods and Technical Terms: An Overview” and “Experimental Methods and Conditions Used for Investigating the Amsterdam *Sunflowers* and Mock-up Paints” (pp. 210-227).

[4] Vincent van Gogh, “Letter 674 to Theo Van Gogh. Arles, Tuesday 4 September 1888,” in *Vincent van Gogh: The Letters* (Amsterdam: Van Gogh Museum, 2007): <http://vangoghletters.org/vg/letters/let674/letter.html>.

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ISSN 1553-9172