

# The traveling goat made possible. Using noninvasive portable technology to investigate Robert Rauschenberg's *Monogram*

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## ABSTRACT

Robert Rauschenberg's *Monogram* (1955–59) is the starting point of his *Combines* series and an emblematic work in the Moderna Museet collection. The piece includes animalia of a goat, and due to its fragile composition its travel has been highly restricted. As part of the retrospective Rauschenberg exhibition arranged by Tate Modern, MoMA, and SFMOMA (2016–18), *Monogram* was requested for loan. To decide whether *Monogram* was fit for travel, a collaboration was initiated with the Swedish National Heritage Board's "Guest Colleague" program, which offers access to a portable x-ray system, x-ray fluorescence spectrometry (XRF), and microfading analysis equipment. The examinations resulted in new knowledge regarding the inner construction of *Monogram* and the materials used. They also suggested a suitable

## INTRODUCTION

In connection with the Robert Rauschenberg retrospective arranged by Tate Modern, MoMA, and SFMOMA in 2016–18, *Monogram* (1955–59) was requested for loan from the Moderna Museet in Stockholm. The artwork had been on the museum's loan blacklist because of its presumed fragile construction and the risks inherent in its transport. However, because of *Monogram*'s significance in Rauschenberg's oeuvre and the close relation the artist had to the Moderna Museet, it became the museum's aspiration to make travel possible.

Loans that demand the transportation of complex three-dimensional artworks require answers that are not always at hand for the conservators responsible for evaluating the risks. A shared loan decision is based on the inherent material, structural, and surface properties of an artwork. These are determined by visual inspection, experience, available examinations, and by the borrowing institution's ability to provide the requested climate, security, handling, display, facility, and environmental conditions. In some cases, more thorough investigations are necessary.

The conservators at Moderna Museet have long been intrigued by the composition and inner construction of *Monogram*. To fully comprehend and investigate the condition of the work, a collaborative research project was formed together with the Swedish National Heritage Board within the framework of their "Guest Colleague" program. The program supports museums in Sweden with heritage-science resources, by providing laboratory access, scientific equipment, and portable instruments (Figure 1).

## THE ORIGIN AND ACQUISITION OF MONOGRAM

In 1955, Rauschenberg visited a second-hand office-supply store in New York and bought a long haired, horned, stuffed goat. The goat came with a metal plate<sup>1</sup> stating that it was a young Angora goat prepared for Sanford Mills, a company that specialized in mohair fabrics but which ended their production in 1955.

The goat's face was damaged on one side and Rauschenberg is said to have repaired it with papier-mâché and clay followed by a coating of paint (Schultz-Lundestam 1996). It has also been claimed that Rauschenberg cleaned the dusty and matted fleece using dog shampoo (Tomkins 2005).

and safe mode of transport and increased the profile of the Moderna Museet's Conservation Department through a massive response from the press and public.



**Figure 1.** XRF measurements of elements in the paint layers. Robert Rauschenberg, *Monogram* (1955–59). © Robert Rauschenberg/Untitled Press, Inc./Bildupphovsrätt 2016 (photo: Åsa Lundén/Moderna Museet)



**Figure 2.** Robert Rauschenberg, *Monogram* (1955–59). © Robert Rauschenberg/Untitled Press, Inc./Bildupphovsrätt 2016 (photo: Prallan Allsten/Moderna Museet)

The goat was in Rauschenberg's studio for five years before he found the right place for it. At first he tried to place it sideways on a shelf against a painting. In 1956 he placed it in front of a painting and put a tire on its back. The third and final version was achieved in 1959, after a suggestion from fellow artist Jasper Johns. The goat was then placed on a painting, a horizontal platform covered with paint and collage (Rauschenberg 1997, Schimmel 2005, Tomkins 2005). In this shape it was named *Monogram* and displayed for the first time in 1959, at an exhibition at Leo Castelli's gallery.

The close relationship between the Moderna Museet and Rauschenberg developed during an earlier exhibition, *Movement in Art* (1961). *Monogram* was displayed for the first time in Sweden as part of the exhibition *Four Americans*, which opened at Moderna Museet in 1962. The work was, at least at first, not warmly greeted by the Swedish press (Eriksson 2006).

*Monogram* was acquired by the Moderna Museet in the autumn of 1964, following the efforts of the museum's director Pontus Hultén (Eriksson 2006). At that time the acquisition was a highly disputed one, to the point that the goat was first kept in Pontus Hultén's private home, where his daughter often played with it (Wibom 2016). Over the years, appreciation for the piece grew such that today *Monogram* is one of Moderna Museet's most beloved artworks and is on permanent display. The acquisition was made possible through extra funding from Gerard Bonnier and "Friends of the Moderna Museet."

## **DESCRIPTION OF THE COMPONENTS AND CONDITION**

*Monogram* is made up of several different materials (Figure 2). The painted taxidermied Angora goat has a painted rubber tire placed around its body. It is standing on a two-part canvas painting with a collage that includes printed paper, textile, wood, a metal sign, a rubber shoe heel, and a tennis ball.

The rubber tire, from Goodyear Tire & Rubber Company, applies pressure to the structure of the taxidermied animal. The conservators at Moderna Museet also noted that the animal is leaning slightly to one side, perhaps because of a weakened structure. Comparisons between archival photos of the fleece with more recent ones clearly show that the fleece has acquired a more rugged and tangled look. Brushing the hair causes hair loss and every contact with the hair risks distressing the work even more. Today, *Monogram* is protected by an acrylic case.

When assessing the crucial facts that would determine the suitability of the work for travel, the focus was the internal structure of the goat and the state of the fleece. The light sensitivity of the different materials was considered. Further anticipated areas of investigation, outside those of the present research, are the state of the rubber tire, which has shown signs of ozone-induced cracking and decay due to rubber's short life cycle. From a long-term perspective, this is problematic. In addition, both the painting and the collage platform underneath the goat show signs of flaking, loss of paint, craquelure, discoloration, and lifting.

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**Figure 3.** The goat being washed by a conservator in 1969. Robert Rauschenberg, *Monogram* (1955–59). © Robert Rauschenberg/Untitled Press, Inc./ Bildupphovsrätt 2016 (photo: Archive/ Moderna Museet)



**Figure 4.** The goat separated from its tire. Robert Rauschenberg, *Monogram* (1955–59). © Robert Rauschenberg/Untitled Press, Inc./ Bildupphovsrätt 2016(photo: Archive/ Moderna Museet)

## BROKEN LEG AND SHAMPOO?

Many stories and rumors surrounding the artwork and its component pieces have flourished over the years, gathering interest from an art historical perspective. For example, there have been rumors that the goat's leg was broken and even stories of people sitting on top of the goat in the early days of the museum's history. During the present research, the conservation history of *Monogram* was traced through archives and records.

The artwork was not always protected by an acrylic case. A staff member at Moderna Museet recalled that whenever Rauschenberg visited the museum the rule was that the acrylic case had to be removed. On one of these occasions, a visitor placed chewing gum in the eye of the goat (Taube 2016). It has been difficult to establish when the first acrylic case was added, but the earliest photo found of *Monogram* protected by an acrylic case is from 1973.

According to the Swedish press, the taxidermied goat was damaged in the 1960s after a drunk person sat on it, and the fleece was cleaned so that residues from soda and ice cream could be removed (Hård af Segerstad 1969). An archival photo (Figure 3) and text confirmed a washing in 1969 and a hair brush marked *Monogram* was found in the Conservation Department. Over time, the canvas painting has been consolidated and the goat's fleece has been brushed several times.

The goat's broken leg is mentioned in Calvin Tomkins *Off the Wall – A Portrait of Robert Rauschenberg*. Tomkins described the damage as having been caused after the European tour and prior to the Robert Rauschenberg exhibition in 1963 at the Jewish Museum in New York. Tomkins reported that the museum's director, Alan Solomon, hired a natural history conservator for the conservation. In an attempt to confirm this information for this research, the Jewish Museum, Calvin Tomkins, and MoMA were contacted but the story could neither be confirmed nor disproved. Information about the rumors of a broken leg was further searched for in the private archive of Pontus Hultén, in Moderna Museet's conservation archive, and staff members were interviewed.

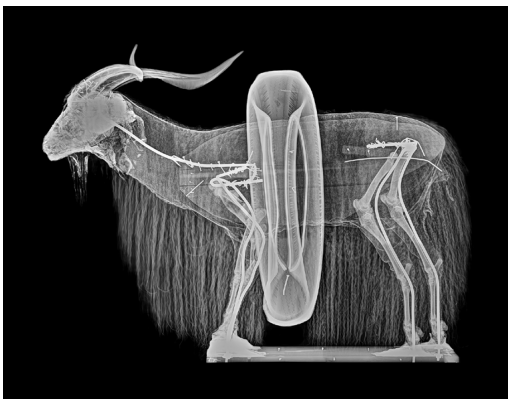
*Monogram* has traveled many times in the past with different packing approaches but is now restricted for loans. The latest exception was the touring exhibition *Robert Rauschenberg: Combines*, in 2005. As late as 1997, the tire was transported separately from the goat (Figure 4), reinstalled to its place on the goat's back at every exhibition, which stressed the tire through handling and manipulation.

## EXAMINATION

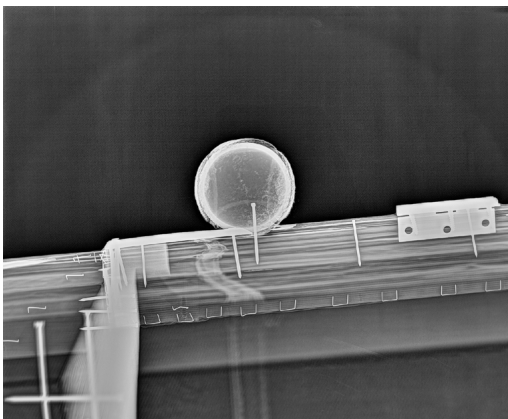
The Swedish National Heritage Board has offered its "Guest Colleague" program since 2014. Scientific equipment and knowledge are offered as a free service to conservators at state-owned museums and institutions in Sweden. In a collaboration initiated at an early stage of the planning process, the museum's conservators, together with staff from the Swedish National Heritage Board, were able to examine *Monogram* in situ, in its permanent exhibition space, over the course of three days (Figure 5).



**Figure 5.** My Bundgaard, Thérèse Lilliegren and Kaj Thuresson performing XRF analysis of Rauschenberg's *Monogram*, 2016 (photo: Åsa Lundén/Moderna Museet)



**Figure 6.** Twelve assembled x-ray images of Rauschenberg's *Monogram*. Images by Magnus Mårtensson, Swedish National Heritage Board, 2016



**Figure 7.** X-ray image of the tennis ball in Rauschenberg's *Monogram*. Images by Magnus Mårtensson, Swedish National Heritage Board, 2016

Due to radiation hazards, x-ray imaging of the goat was performed on a day when the museum was closed to the public, which facilitated adherence to safety regulations. The press was invited and covered the x-ray investigation. Microfading measurements had to be performed in the conservation studio at the museum due to inadequate light conditions in the exhibition area. The x-ray fluorescence (XRF) examination was performed when the museum was open and the analysis could be observed by the public.

The artwork was investigated using digital x-ray. The images were captured using a portable x-ray system,<sup>2</sup> including digital plates and a scanner.<sup>3</sup> Imaging was performed for 30 s at a potential of 100 kV and a current of 4.5 mA, with the artwork placed at a distance of 2000 mm from the source. The images were modified using a contrast-enhancing filter and assembled into a complete image. Open radiography performed at the museum strictly followed security and protective measurements (Swedish National Heritage Board 2013).

To gain further expertise on animalia as part of museum collections, the Natural History conservator Göran Sjöberg was present at the site when x-ray imaging was done and was consulted during the project. The taxidermically treated animal was comprehensively imaged through digital radiography.

Element analysis was performed by XRF<sup>4</sup> at microspots on the different paint layers in order to identify the pigments used by the artist. Microfading tests were performed on some of the different materials that make up *Monogram*. The microfading instrument<sup>5</sup> exposes very small selected points to high light levels and thus measured their light sensitivity. The combined results from XRF and microfading can be used as a guide for the lighting limits allowed during an exhibit.

## **RESULTS – THE INSIDE OF THE GOAT REVEALED**

Digital x-radiography made the components of the taxidermically preserved goat clearly visible to the conservators. The assembled image (Figure 6) shows that the inside of the goat consists of a profile-cut wooden construction with an iron structure attached with nails. Parts of the remaining skeleton in the head and the legs of the animal had been left during taxidermy. Clay, wood wool, and wire were used to shape the inside of the goat. Although fractured bones were visible, they had no effect on the stability of the construction. The images also confirmed that the weight from the tire had deformed the goat's back. Further x-ray imaging of the artwork showed that the tennis ball on the canvas platform was attached at least partially with a nail (Figure 7).

An important result from the XRF analysis was that traces of arsenic were found on the goat. Arsenic is not an uncommon finding in natural history collections, as it is used as a protective measure against insects and other pests. However, the discovery will affect the safety routine for staff handling of *Monogram* in the future, as any work on the piece should be conducted in a well-ventilated workspace. Workers should also don a filtered protective mask, protective clothes, and gloves, all of

which should be treated as contaminated material after their use (Swedish National Heritage Board 2016).

The XRF instrument also detected elements corresponding to the pigments usually found in different colors of paint from the time period when the piece was made, such as Cd, Co, Cr, Pb, and Ti. The white paint on the tire consists of two or more different types of paint.

The microfading results showed that all the examined microspots were less sensitive to color change from exposure to light than the Blue Wool 3 standard and were therefore not categorized in the “high sensitivity” category as defined by the European Committee for Standardization (2014). In interpreting the microfading results, consideration was paid to *Monogram*'s many years of light exposure during its constant display in the permanent exhibition.

An unexpected result of the project was that the museum benefited from the wide interest on the part of the public and media. The project's initial results were communicated through the press and on the museum's website.

### **TREATMENT AND SUITABLE TRANSPORT**

With a world tour ahead, the plan was to safely transport and make *Monogram* look its best. Knowing that the inner construction was stable enough, the loan request was approved and the conservation needs of the goat's fleece were attended to. The “White spirit method” (Kite and Thomson 2006) was considered to work out the worst tangles in the fleece, but because of the limited time available a minimal intervention was accepted. In the end, to minimize static, a porcupine quill and a bone folder were used to untangle parts of the fleece. Every component of *Monogram* was dusted and liftings on the canvas painting were consolidated with ethulose 0.5 % in H<sub>2</sub>O, applied with a small brush and then flattened with heat. Due to the arsenic that had been detected, protective measures were taken when handling the goat.

Weighing the outcome of the examinations and the information gathered, it was decided that many additions could be made to the former transport crate for *Monogram*. The outlined objectives included:

- support the goat snugly in the inner crate through minimal contact with the fleece;
- fixate the tire and distribute the weight away from the goats back without removing it;
- mitigate shock and vibration; and
- implement climate protection.

By using the x-ray images of the goat, the best support points could be identified and a support system designed. The solution was to make padded braces that stabilized the goat without abrading the fleece (Figure 8). The tire was fixed with a foam-padded strap and custom-shaped holders, which relieved the weight of the tire from the goat's back.

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**Figure 8.** New crate for transporting *Monogram*. © Robert Rauschenberg/Untitled Press, Inc./ Bildupphovsrätt 2016 (photo: Åsa Lundén/Moderna Museet)

A padded double crate was chosen to minimize shock and vibration and avoid fluctuations in temperature. Low-density polyethylene foam was used for insulation, shock, and vibration mitigation. The producer's padding calculator software<sup>6</sup> was used to determine the optimal amount of foam. The calculation was based on the mode of transport (in this case, both aircraft and truck), the choice of padding, the size of the crate and nominal area, the probable drop height, the fragility of the object (in this case set to 40 G) plus the weight of the inner crate.

## **DISCUSSION**

Attempts to confirm some of the stories surrounding *Monogram* were not always successful but they highlight the importance of continuous and thorough documentation of any artwork. Previous washings of the goat's fleece could have caused the many tangles and may also explain why only small amounts of arsenic were detected, even at spots such as around the eyes and mouth of the animal. The investigation of *Monogram* required extensive archival research as well as research into crating and transport possibilities. The deadline that came with the loan-request was very limiting, such that little time was available for active conservation, analysis, and in-depth interpretation of the acquired information.

In the future, the paintings and fleece will be examined more closely, and if possible treated. It would also be of interest to investigate the state of degradation of the rubber in the tire and in the tennis ball. The results from the analysis of binders and pigments will be further interpreted to gain knowledge on Rauschenberg's techniques and materials.

Investing in advanced analytical instruments that require specialist knowledge is not a realistic prospect for all institutions. The investigation performed would not have been possible without the service provided by a state-funded research institution. The combination of specialists

from Moderna Museet and the Swedish National Heritage Board was necessary for the success of this specific project.

Several overall questions were raised during the project:

- What would the artist have thought about the x-ray analysis? Would there have been a reason for him not wishing to reveal the inside of the object?
- When a project is public, can the presentation of some results be problematic?

The internal and external publicity of the conservation project grew in unforeseen ways. The conservators had to meet the press, grant interviews, and be more in the public eye than usual. This was an unexpected but overall positive experience that required close work between the conservators and the museum's Communications Department.

## CONCLUSION

This project has resulted in new knowledge of the inner structure and materials used in *Monogram*. This information has given rise to new guidelines on how best to handle this treasured artwork and to new safety measures to secure the health of the museum staff.

The investigation demonstrates the advantages and utility of analyses undertaken using noninvasive portable instruments. It also offers an example of how a museum can, through collaboration with a state research institution, develop and extend their investigations with a shared benefit for all of the involved parties. The Conservation Department at Moderna Museet has also been inspired to find other conservation research projects that can be made visible to the public, including allowing the international public to contribute new information.

Finally, the research questions of this project have been answered. The goat's journey was deemed possible. Moreover, the results of the examination gave the conservators greater confidence on how best to display *Monogram* and how to secure the goat during future transport.

## ACKNOWLEDGEMENTS

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## NOTES

<sup>1</sup> Angora (Mohair) buck; Flock reg. no. 654, yearling; from William Riddell & Sons, Monmouth, Oregon; prepared by Angora Journal, Portland, Oregon, for Sanford Mills; Sanford, Maine; Mohair – most enduring of all textile raw materials.

<sup>2</sup> Eresco 42MF4, General Electric Co., Fairfield CT, USA.

<sup>3</sup> CR<sup>2</sup> Flex, General Electric Co., Fairfield CT, USA.

<sup>4</sup> ARTAX 800, Bruker, Berlin, Germany.

<sup>5</sup> Microfader built in-house at the Swedish National Heritage Board.

<sup>6</sup> Zotefoams packaging calculator: [www.zotefoams.com](http://www.zotefoams.com).

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