Hidden Under the Skin: Examination of an Ecuadorian Polychrome *Madonna of the Immaculate Conception*

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Introduction

This research was born out of the examination and search for understanding of the material and cultural context of ACP 1556, a possibly 19th-century polychrome sculpture of the Immaculate Conception brought from Quito, Ecuador to the United States in the mid-1940s and to the WUDPAC clinic in 2013. Through the study of cross-sections and other types of samples obtained from the sculpture, the pigments, binders, and surface coatings were identified. The findings helped date the underlayers to earlier centuries and determine the conservation treatment. This study will contribute to the limited but growing literature on analytical examination of Spanish Colonial Art.

The Sculpture

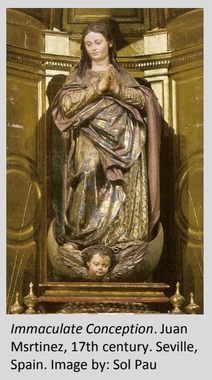
Description

The polychrome wooden sculpture of the Virgin Mary measures 37.125” x 17.5” x 3.25”. The sculpture was part of the interior ornamentation in a church in Quito, Ecuador. The crescent moon and praying gesture with the face tilted downwards identify the sculpture as an Immaculate Conception. The sculpture may have been part of a *retablo* (altarpiece) or a wall decoration within another portion of the church.

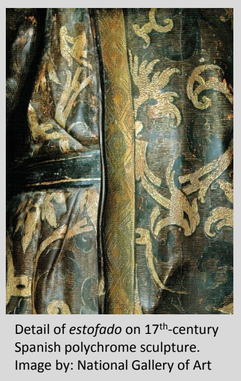
Art Historical Context

Spanish Colonial Art in Quito can be traced to the Franciscan Order’s establishment of the Colegio de San Andrés in 1555. This school produced the first native artists of Quito. They learned iconography by copying European models. Sculptures from Quito were influenced by the schools of Castille, Seville, and Granada. Quito is located near a wealth of natural resources providing easy access to wood, stone, and precious metals.

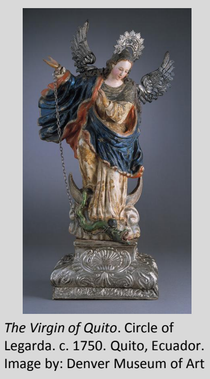
Spanish polychrome sculptures of the 16th century were usually dressed in robes actually made of linen or sackcloth. 17th-century fashion featured brocades and velvets embellished with gold. To recreate this, artists used a technique called *estofado* which involved gilding, overpainting, and then scribing decorations to reveal the gold underneath (*sgraffito*). Tastes and materials changed in the eighteenth century; sculptures then began to feature fabric covered with plaster for the drapery, lead mask faces, glass eyes, and real hair. Artists began incorporating wings, halos, and chains made of silver or copper alloys into their sculptures. The use of *sgraffito* became old fashioned by the eighteenth century and was set aside for the *estofado a la chinesca* for which silver leaf was used. Overall transparent glazes were sometimes combined with gilded designs in relief.



Immaculate Conception. Juan Msrtinez, 17th century. Seville, Spain. Image by: Sol Pau



Detail of *estofado* on 17th-century Spanish polychrome sculpture. Image by: National Gallery of Art



The Virgin of Quito. Circle of Legarda. c. 1750. Quito, Ecuador. Image by: Denver Museum of Art

Analysis

X-Radiography

X-radiography provided information on the construction of the sculpture which was made from three vertical planks of wood adhered together. No metallic joinery was revealed; planks are likely held together with an adhesive and/or wooden dowels (not yet detected). X-radiography also revealed the extent of the degradation of the wooden support from past insect infestations, losses in the ground and paint layers, and the possible use of a radio opaque filler (such as lead white) from past restorations.

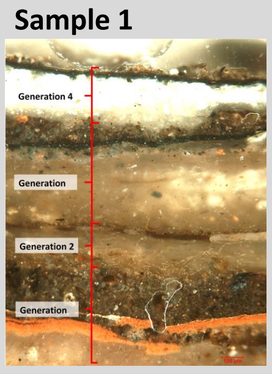
XRF

XRF analysis in an area of loss suggests the ground layer is composed of gypsum (CaSO4). Analysis of the presentation surface revealed mercury and lead in the flesh tones as well as in the lips and red underside of the blue mantle, indicative of vermillion, red lead, and lead white. The presence of Ba in the darker red layer on the underside of the blue mantle suggests the use of a red lake. The whites appear to be lead white and zinc white.

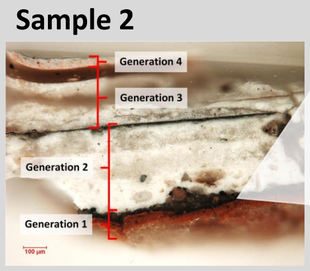
Cross-sections

Cross-section microscopy performed on the sites identified in red revealed the presence of four generations of paint. A layer of gilding with paint applied over it in the first generation implies the use of the *estofado* technique. A layer of metal leaf was identified in the second generation. UV fluorescence and fluorochrome staining indicate the use of a carbohydrate and protein binder in the first three generations of paint and an oil binder for the fourth generation.

Sample 1

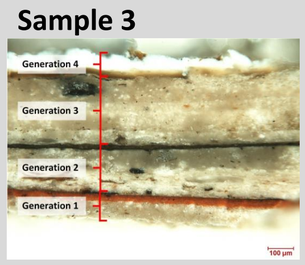


Sample 2



Bole, gilding, and paint layers in the 1st generation

Sample 3



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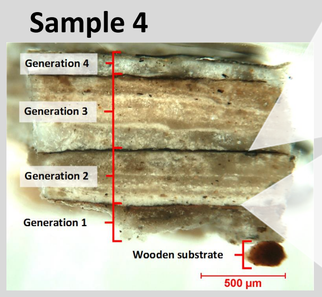
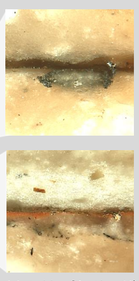
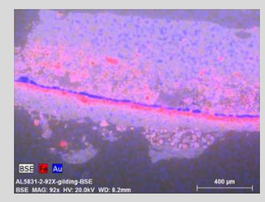
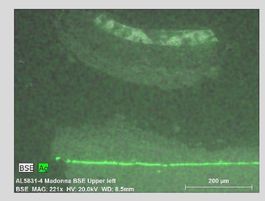




Metal leaf in the 1st and 2nd generation

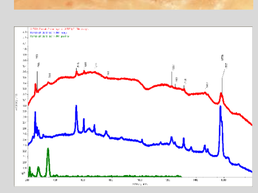
SEM-EDS





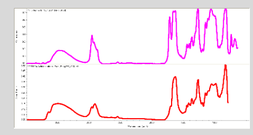
SEM-EDS analysis of sample 1 (CS1) revealed a layer of gilding in the first generation. The metal was identified as gold, with an iron-rich layer underneath the gilding, most likely a bole. A layer of metal leaf was detected in the second generation of sample 2 (CS2). EDS results identified the metal as silver.

Raman



Raman spectroscopy was performed on CS2. Sample location identified in white. The layer of blue over the gilding in CS2 was a match for an indigo reference spectrum.

FTIR



FTIR analysis of the adhesive used in a previous restoration showed characteristic absorbance peaks for cellulose nitrate. [Cellulose nitrate was used in the early 20th century as an adhesive –Duco Cement.] Sample location identified in blue.

Interpreting the Results

The visual and technical analysis of this sculpture places it in close relationship with the Sevillian style and with what was being produced in Quito in the seventeenth and early eighteenth century. Examples of seventeenth-century polychrome sculptures from Quito employed azurite and indigo for the blue. The color palette was extended in the eighteenth century to include the use of Prussian blue. The materials identified in the first generation on ACP 1556 seem to fit better with the 17th century. However, the materials found in the second generation of paint do correlate to 18th-century materials, specifically the silver leaf. The presence of gold and indigo in the lowest paint layer supports the case for an earlier date of the original creation, placing the first presentation surface of the sculpture closer to the seventeenth century.

The image on the right is a digital reconstruction of what the sculpture may have originally looked like in the 17th c. The pink and white areas of the drapery and the moon would have also been gilded.

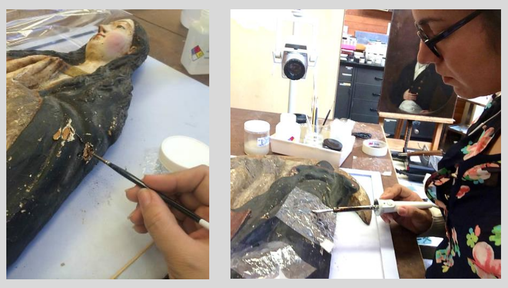
Treatment in Progress

Condition

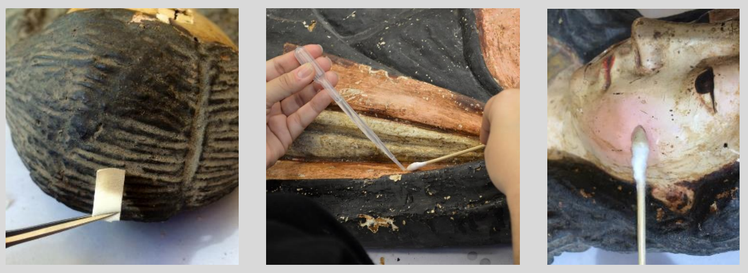
The sculpture had an overall layer of grime. There were remnants of a partially removed, discolored varnish and areas of uneven overpaint. The paint and ground layers were actively flaking, and the insect damage created weak spots in the wooden support.

Treatment to Date

1. Application of 10% Aquazol 200 in 1:1 isopropanol and water was followed by heating with a tacking iron.



2. The surface was cleaned using PVOH sponges and D4 (cyclomethicone, to prevent penetration of aqueous soluutions which could impact on water-soluble underlayers) followed by a 2% citrate solution buffered to a pH of 8.5 with TEA.



3. The paint layers on the face and hands were humidified with the use of Gore-Tex. Consolidation and flattening with 10% Aquazol 200 in 1:1 isopropanol and water were followed by heating with a tacking iron.

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