

# JACOBINE JONES IN PROCESS: A TECHNICAL ANALYSIS

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## INTRODUCTION

This research project undertook the technical analysis of six objects by British-Canadian sculptor Jacobine Jones (1897-1976) from the Agnes Etherington Art Centre. Queen's University inherited the artists' studio contents in 1990, including bronzes, casts, molds, maquettes, sketches, business and personal documents. Working at a time when both women and sculpture were systematically secondary in the art world's hierarchies, little is known about Jones' artistic process. The interdisciplinary nature of conservation allows for object-based enquiry which can shed light on artists who may have been overlooked due socio-historical biases. Combining scientific methods of investigation with archival research, an analysis of "in-process pieces" alongside finished sculptures and archive material contributes to our understanding of Jones' process, materials and techniques, and how they have evolved as she became a senior artist.

## EXPERIMENTAL

**Materials:** Six artifacts (Agnes Etherington Art Centre) ; Archival material (Queen's University Archives)



### Methods of Analysis:

- X-ray fluorescence spectroscopy (XRF)
- Fourier transform infrared spectroscopy (FTIR)
- Digital photography and multi-spectral imaging system VSC 8000 (normal light photography, infrared radiation imaging, ultraviolet imaging, x-radiography)
- Archival research

L-R: Mould for *Happy Horse*, 1930; *Happy Horse*, plaster, 1930, *Happy Horse*, bronze, 1930; *Female action torso*, n.d; Mould for *Female Torso*, 1969; *Female Torso*, 1969.

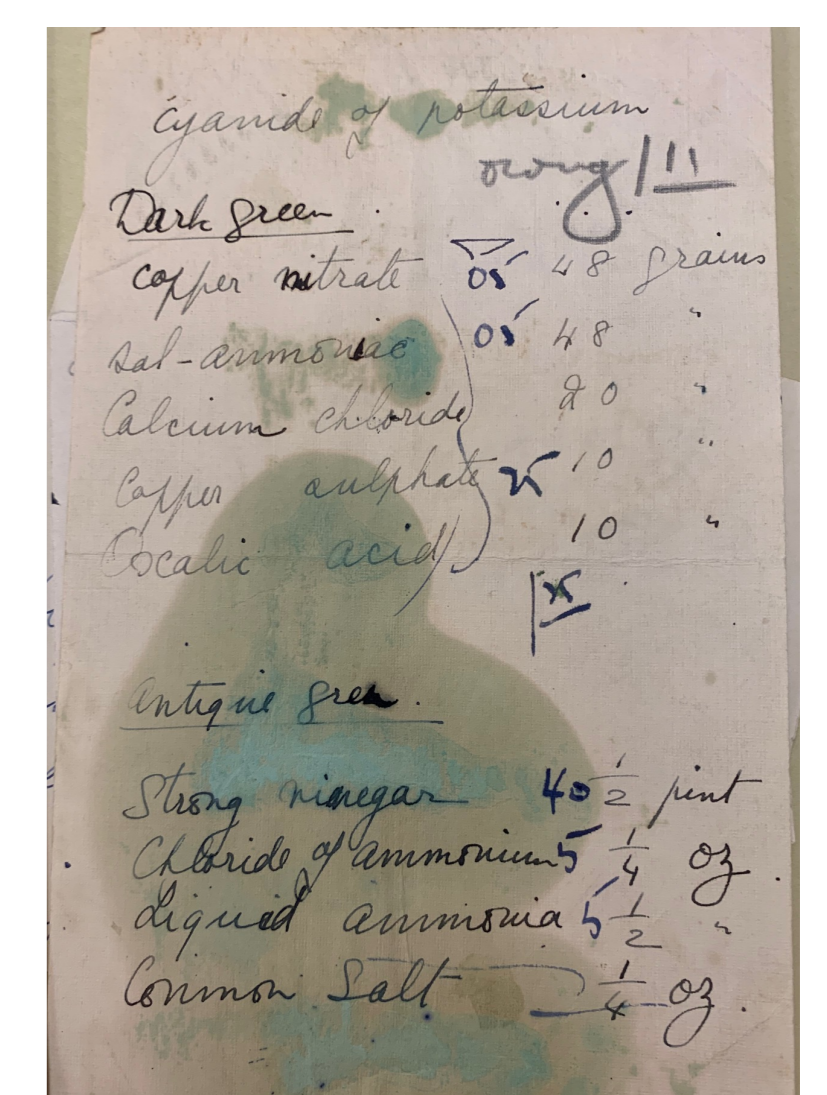
## RESULTS AND DISCUSSION

Table 1: Key data for each object by method of analysis

Object	XRF peaks observed: major (bolded) minor (normal) and trace elements (italicized)	FTIR peaks identified or spectral matches	Multispectral imaging (relevant selection)
Mould for <i>Happy Horse</i> (previously identified as silicon rubber), 1930	• <b>Pb, S, Ca, Fe, Ni</b>	• Phthalate • Hydrocarbon wax	• IR: fingerprints visible on exterior of mould • One-piece mould, jagged cut lengthwise
<i>Happy Horse</i> (plaster), 1930	• <u>Body</u> : <b>Ca, S, Fe, Cu, Ni, Zn, Si</b> • <u>Area of dark paint</u> : <b>Fe, Cu, Ca, Zn, Pb</b> and/or S	• Calcium sulfate • Phthalate • Hydrocarbon wax • Distinct peaks at 1092 and 1004 cm <sup>-1</sup> from unidentified component	• UVF: overall orange fluorescence: binder or mould release agent • IR: toolmarks visible
<i>Happy Horse</i> (previously identified as bronze), 1930	• <b>Cu, Zn, Fe, S</b>		• X-radiography: solid cast • UVF: small areas of blue-green fluorescence :repairs or patina residue
<i>Female Action Torso</i> (clay maquette), n.d	• <b>Fe, Ca, Si, Ti, Zn, K, Al, S, Ni</b>	• Clay	• X-radiography: Radio-opaque rod visible from base to rib
Mould for <i>Female Torso</i> (plaster and plastic), 1969	• <u>Plaster</u> : <b>Ca, S, Si, Fe, Ni</b> • <u>Plastic</u> : <b>Pb, S, Ca, Fe, Ni, Cl</b> • <u>Wax</u> : <b>Ca, S, Si, K, Fe, Ni, Cu</b>	• <u>Plaster</u> : calcium sulfate • <u>Plastic</u> : phthalate ester • <u>Wax</u> : hydrocarbon wax, phthalate	• UVF: orange-red fluorescence on the inside of plaster • UVR: brushstrokes visible on inside of plaster • NL: scrim, or burlap, visible, used to solidify plaster jacket mould
<i>Female Torso</i> (plaster), 1969	• <b>Ca, S, Fe, K, Cu, Ni</b>	• Calcium sulfate • Ester peak	• X-radiography: Radio-opaque rod visible from base to rib • UVF: areas with repairs

Table 2: Key findings from archival research

Relevant object(s)	Findings (selection)
All	<ul style="list-style-type: none"> <li>• Lecture drafts on sculpture technique</li> <li>• Notes on materials</li> <li>• Financial accounts (invoices for materials and from founders, extensive cost calculations, loans)</li> </ul>
<i>Happy Horse</i> series	<ul style="list-style-type: none"> <li>• Sketches of rearing horses</li> <li>• Likely foundry: A. B. Burton, Surrey, UK</li> <li>• Patina recipes</li> </ul>
<i>Torso</i> series	<ul style="list-style-type: none"> <li>• Sketches, notes</li> <li>• Likely foundries: Roman Bronze, NY or Tomilson Foundry, Toronto</li> <li>• Record of 3+ bronze castings, and notes on their manufacturing process</li> </ul>



Top left: annotated sketch for *Torso*, n.d. Top right: one of many patina recipes in Jones' handwriting (QUA), Bottom: Sketch of rearing horse, n.d.

Object	Conclusions: Materials and techniques
<i>Happy Horse</i> , mould, 1930	<ul style="list-style-type: none"> <li>• Spectra does not match for silicon rubber, but matches 1969 plastic mould material</li> <li>• Likely presence of a mould release agent containing a mixture of paraffinic hydrocarbon wax and dialkyl phthalate ester (Williams 2023)</li> <li>• One part plastic mould poured over original (likely wax or clay) and cut open in a jagged line to release cast</li> </ul>
<i>Happy Horse</i> , plaster, 1930	<ul style="list-style-type: none"> <li>• Gypsum/plaster of Paris</li> <li>• Metallic pigments (containing Fe, Cu...). Paint binder not identified</li> </ul>
<i>Happy Horse</i> , metal-alloy, 1930	<ul style="list-style-type: none"> <li>• Solid cast Cu-Zn-Fe alloy: <b>brass</b>, not bronze (Cu-Sn)</li> <li>• Trace of S likely from chemical patination (ex. "liver of sulfur" or K<sub>2</sub>S.)</li> </ul>
<i>Female Action Torso</i> , clay, n.d.	<ul style="list-style-type: none"> <li>• Unfired clay, likely a maquette for different torso (<i>Stone Torso</i>)</li> <li>• Key part of the process: "sketch in clay"</li> </ul>
Mould for <i>Female Torso</i> , plaster and plastic, 1969	<ul style="list-style-type: none"> <li>• <u>Plaster</u>: gypsum/plaster of Paris. Scrim visible in jacket mould.</li> <li>• <u>Plastic</u>: Unidentified. Phthalate due to mould polymer or wax mould release. Possibly a polysulfide polymer. Pb and S could also be from a vulcanizing agent for natural/synthetic rubber (Williams 2023). FTIR spectra matches 1930 mould material.</li> <li>• Brushstrokes likely from painting on mould release</li> </ul>
<i>Female Torso</i> (plaster), 1969	<ul style="list-style-type: none"> <li>• Gypsum/plaster of Paris</li> <li>• Further analysis required to determine whether the ester peak is from oil, acrylic, or other</li> </ul>

## CONCLUSIONS

- Throughout her career, Jones made small-scale sculptures "for the home," vital to her remaining financially afloat in between architectural sculpture commissions.
- They were made in the traditional process of modelling and casting with consistency in materials and techniques.
- Further analysis is required to identify the polymer used for the moulds, which analysis suggest could be the same in 1930 and 1969, and the chemical patination.
- The technical analysis of 6 objects by Jones, alongside extensive archival holdings, has begun to shed some light on her artistic process from a technical point of view.
- Due to its interdisciplinary nature, combining methodologies in scientific analysis and the humanities, conservators have a privileged role in shedding light on artists who may have been overlooked due socio-historical biases.

**Further research:** Continued material characterization, and cross-referencing with archival findings (polymer, patina), outlining a feminist methodology for conservation

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