
DISCARDED
PAINT
PIGMENTS

Research Experimentations and Observations

By Fiona Gregg

The mission I was assigned is :
"Can we reuse pigment sediment in solvent to make new oil paint?"

Objectives

Create new paint from waste on a small scale in a private studio.

Make tests, does the paint react the same as store bought?

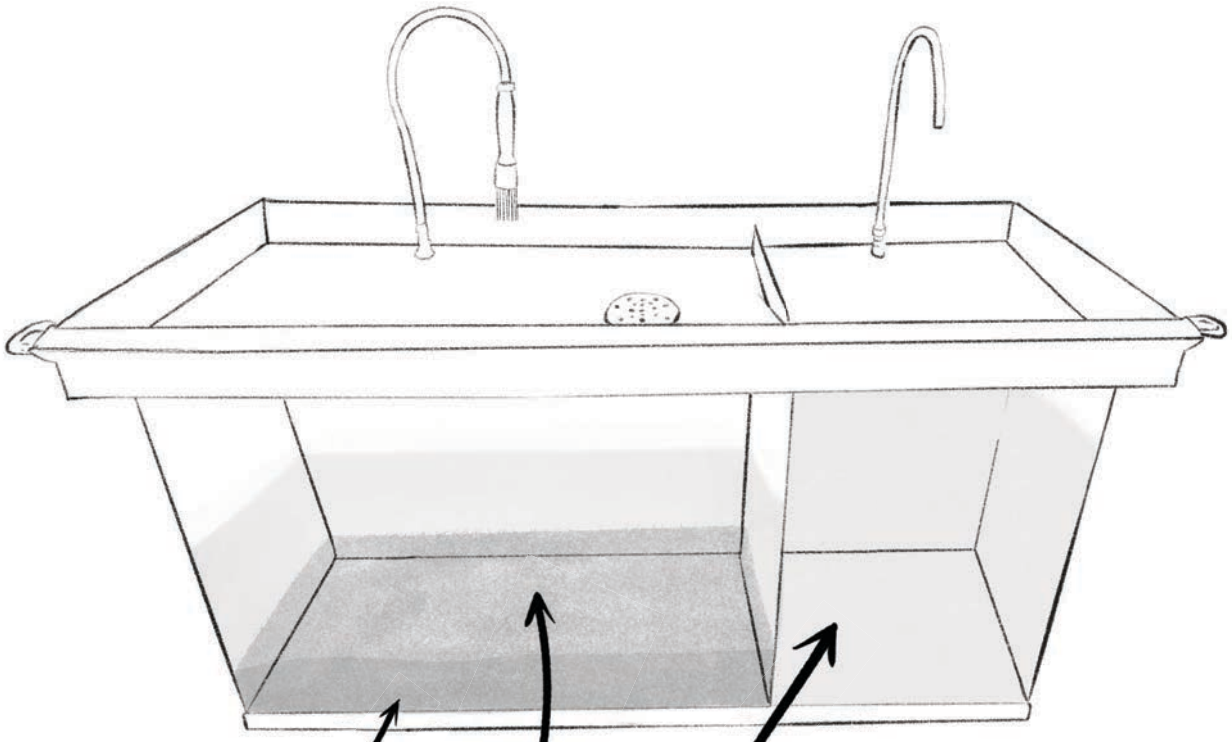
Consider the potential of this method and design a strategy to apply this method on a larger scale.

I'm primarily an oil painter, but I also work as the technician for the Painting and Drawing program here at Concordia, where we have over 800 undergraduates. Our facilities are equipped to safely accommodate students working in both oils and acrylics, and we have a very unique piece of equipment:

This publication was produced by the FOFA Gallery as part of its Exploring Sustainability Across the Arts initiative, a research and outreach program aimed at developing material and eco-friendly practices in cultural venues. Each publication in this series is the result of research conducted by the initiative's collaborators.

Canada Council for the Arts | Conseil des arts du Canada

a solvent dispensing machine



1 Sediment

2 recycled solvent

3 clean solvent tank

To dispense the product to students, we have our custom-built solvent machine with three functions:

- To dispense clean solvent at the press of a button.
- To collect used solvent.
- To dispense used solvent for cleaning purposes.

When painting with oil, you can't use water to dilute your paint or wash your brushes; a specialized solvent is necessary. There are different types that can work well with oil paint. We supply is a less aggressive, nonpolar variety. By providing our solvent in-house, we can ensure students are not bringing in more hazardous materials, creating a safer environment, reducing overall waste, and making whatever waste we do have much easier to manage.

To accommodate the needs of our large student body, this machine is not small and requires regular maintenance: filling it with fresh solvent, emptying used solvent, and cleaning it. Dispersed in the used solvent are millions of pigment particles that slowly settle at the bottom of the tank. These particles once gave the paint its colour, but as the paint dissolves in the solvent, these particles accumulate as sediment. To keep the machine in good working order, myself and the other technicians regularly dredge this sediment out.

When I started working in the program as an assistant technician, my colleague, Joé Côté-Rancourt (now a Sustainability Curator at the FOFA Gallery), asked, "What could we do with all the pigment we are shoveling out of the bottom of this machine?" It was designated as hazardous waste, but could it be transformed into something else? Were these once vibrant and expensive products now really without value? And that's when Joé had the idea of trying to make this wasted pigment back into paint.

Before going further, if you're wondering, yes, the resulting paint is grey, since it's a mixture of all the colours used by our BFA students. You can think of it as poetic or practical. For me, it's both. As a painter, I like having a chromatic grey on hand to temper some colours that are too saturated, and rather than mixing it with my store-bought paints, the idea of simply using what I'd otherwise throw out was very appealing.

So, this project began to take two different directions.

1. How to accomplish this with the sediment from the communal solvent machine in our program

2. How to accomplish this in my own studio

After some basic research, I found that others had successfully completed similar processes in their studios, but I had some doubts about the stability of their end products. Making paint professionally is a scientific endeavor; most painters want a stable, reliable product, and I wasn't sure this process would deliver that. But it was worth a try.

Direction 1

How to accomplish making paint with the sediment from the communal solvent machine.

Ingredients

Sediment from the solvent machine

Walnut oil

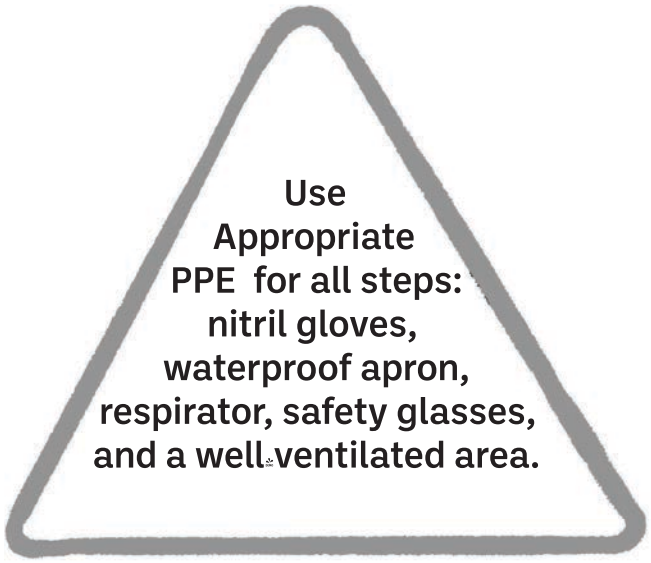
Process

Preparing the "pigment"

1. Remove the used solvent saturated with sediment from the solvent machine.
2. Place the material in an airtight container.
3. Wait about a day for the sediment to fully settle.
4. Pour off the clear solvent.
5. Repeat steps 3 and 4 until the sediment resembles wet sand.
6. Spread the sediment thinly onto a palette.
7. Allow for the solvent to evaporate in a properly ventilated area until the sediment is dry and crumbly.
8. Grind the dry sediment using a mortar and pestle or an old coffee grinder (never reuse either of these for food) Do this until it' is as fine as possible, then grind it some more.

Making the Paint

9. Place the sediment on a glass palette and slowly add oil with a dropper, mixing with a palette knife until a sticky paste forms.
10. Use a glass paint muller to grind the sediment into the oil, breaking apart any clumps. The goal is to have each particle of sediment coated with oil, forming a strong bond.
11. Add more oil as needed until the paint reaches a toothpaste-like consistency.
12. Use right away or transfer into an empty tube for later use.



Traditionally, oil paint is made with two ingredients.
-Pigment
-Binder (oil)

The oil must be a drying oil; the most common are Linseed and Walnut oil.

1.5*

*see observations on next page

3

6

7

10

12

Observations

For my first attempt, steps 1-8 went smoothly, but when I started adding oil and mixing it with the palette knife I noticed the powder wasn't as fine as thought...This led me to two realizations:

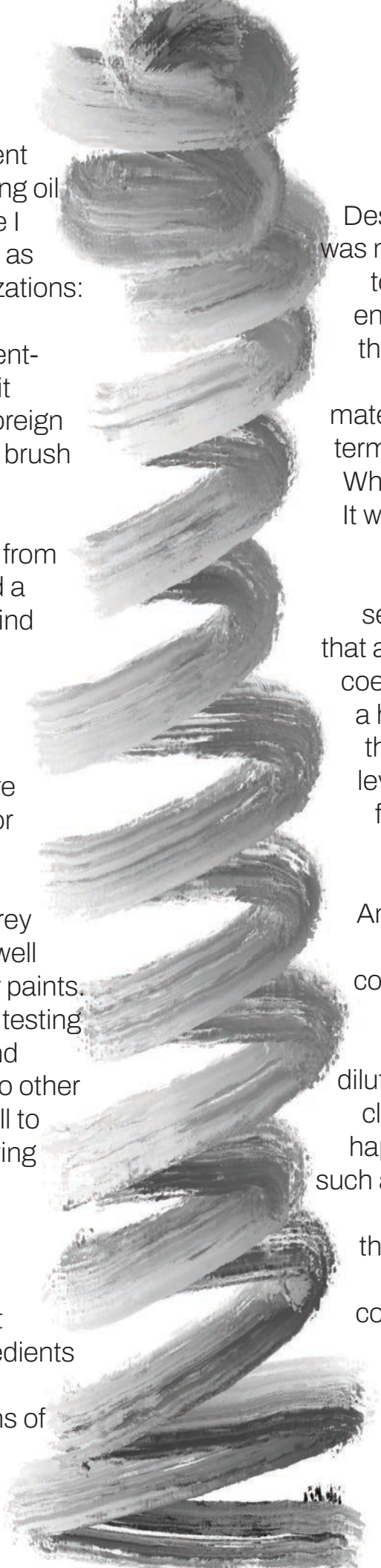
* 1 I should have strained the sediment-saturated solvent after collecting it from the machine. Small bits of foreign materials were present, including brush bristles and pieces of dried paint.

2. The material was clearly different from store-bought pure pigment. It had a slight sheen and took longer to grind into the oil.

Despite these realizations, I continued to mull it, picking out any imperfections until the mixture was smooth, with only a few minor impurities.

The resulting paint was a warm grey with purple undertones; it mixed well with mediums, solvent, and other paints. I used it extensively in my studio, testing it through different techniques, and noticed no difference compared to other store-bought paint. It adhered well to the painting's surface while following traditional fat-over-lean layering and did not chip or rub away with subsequent layers.

Long-term archival quality cannot be confirmed, given that the ingredients contain impurities and unknown elements, but over several months of use, I have noticed no issues.



Further research / Conclusion

Direction 1

Despite the working results, I was not fully satisfied. I wanted to address the two issues I encountered while mixing in the oil and get real scientific answers on whether this material would be stable long-term. I also began wondering: Where did the original oil go? It would not have evaporated with the solvent, so was it dispersed within the dried sediment? If so, how would that affect the paint later? After coercing a chemist to give us a hand to better understand these processes at a micro level, we will be carrying out further research to answer these questions.

Another potential issue with using sediment from our communal solvent machine was contamination. What other products had been diluted into the tank? Despite clear instructions, mistakes happen, and other products, such as varnishes or mediums, may be floating around in the mix, which could further complicate the ingredient composition we were using.

Even if these unknown factors weren't a hindrance but were embraced, creating paint from all the machines' sediment would require additional industrial equipment for grinding the paint. This reclaimed pigment take much longer to grind into the oil than pure store-bought pigment; if we wanted to do all the machines' sediment by hand, we'd be looking at weeks of work hand-grinding. Given the amount of sediment our program produces, we could easily make enough paint to fill at least 200 tubes a year.

All of the unknown elements that may affect the final product, and the realization of the industrialization required for the technician team to adopt this in our program, made me begin to lean away from the idea of making paint from the sediment in the communal machine and turn towards how you could make this process possible in a personal studio, where there would be more control, and a more manageable scale.

Currently our program facilities are not equipped with adequate ventilation to accommodate all students doing this individually with their waste, and we need to continue to use our centralized waste collection system.

Direction 2

How reuse pigment sediment in solvent to make new paint in a private studio.

Supplies

3 Glass Jars with lids
Funnel
Fine strainer
PPE
Glass muller
Mortar and pestle/coffee grinder
Palette knife
Glass Palette
Well-ventilated area

Ingredients

Dried and crushed paint sediment
Walnut or Linseed oil

Process

This process is essentially the same but on a much smaller scale.

1. Wash brushes in a jar of solvent.
2. Strain the now dirty solvent into another container.
3. Let the sediment settle.
4. Pour off now clear solvent (reuse for washing again).
5. Repeat steps 3 and 4 until the sediment resembles wet sand.
6. Spread the sediment thinly onto a palette.
7. Allow for the solvent to evaporate in a properly ventilated area until the sediment is dry and crumbly.
8. Grind the dry sediment using a mortar and pestle or an old coffee grinder (never reuse either of these for food). Do this until it is as fine as possible, then grind it some more.

continue by following steps 9-12 in direction 1

Observations

At this smaller, more controlled scale I noticed the sediment was much smoother, there were less grains of foreign material mixed in which resulted in an easier time mulling the oils into the pigments.

Having the control over the process in my own studio made me think of other options, like having two separate brush washing jars, one for warm colours and one for cool, to later be able to create two different recycled paints.

...?...?...?...?...

Conclusion

Q. Can we make a substance from the pigment sediment in solvent that looks, feels, and on the short term reacts the same as oil paints?

A. Yes

Q. Is the dried sediment we used for pigment the same as store bought pigment?

A. Likely no

Q. Do we know how the sediment paint will react long term?

A. No

Fiona Gregg is an artist who holds a Bachelor of Fine Arts Major in Painting and Drawing from Concordia University (2021). Fiona works across collage, painting, and drawing to create figurative work tethered by materiality, dream, and memory. Fiona was a recipient of the Research and Creation grant from the Canada Council for the Arts (2022) and was a repeated recipient of the British Columbia Arts Council Scholarship Award. Her work has been featured in Creadoras Magazine (2023) and The Pit Periodical (2024). Fiona has exhibited work across Canada.

Bibliography

Julie Caves, “Making Your Own Oil Paint with Jackson’s Pigments”, Jackson’s Art Blog, July 4, 2022, https://www.jacksonsart.com/blog/2022/07/04/making-your-own-oil-paint-with-jacksons-pigments/.

Rutherford J. Gettens and George L. Stout, “Painting Materials: A Short Encyclopedia”, Dover, 2012.

Robert Massey, “ Formulas for Painters”, Watson-Guptill, 1967.