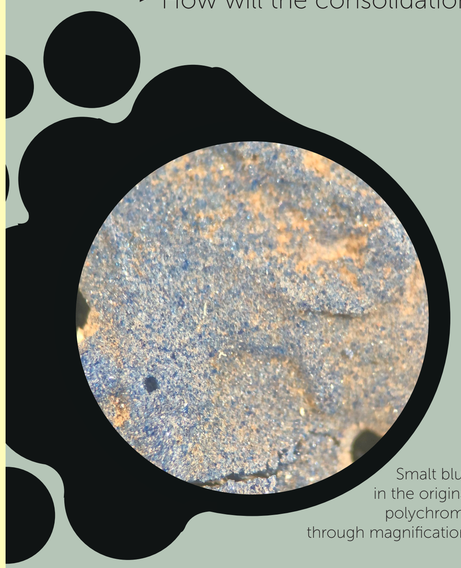
Effects of four consolidants on egg-white paint and their ageing

Main questions

Egg-white distemper technique

- How to preserve its physical characteristics in terms of gloss, cohesion and color after consolidation?
- How will the consolidation age?



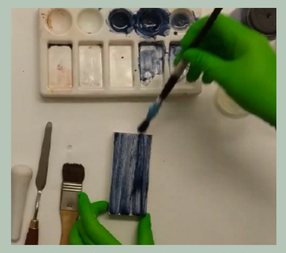
Smalt blue in the original polychromy through magnification.

Background

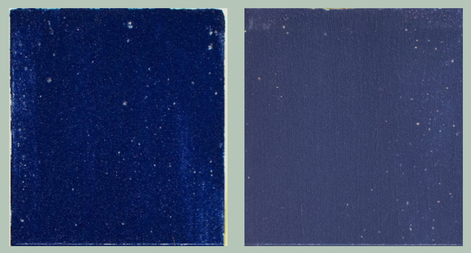
The conservation process of a polychrome wooden sculpture dated 1701.
The paint is composed by egg-white binder, and smalt blue and lamp black pigments.
Some of the commonly used consolidants are Lascaux's MfC, Aquazol 200, sturgeon glue and JunFunori.

Methods

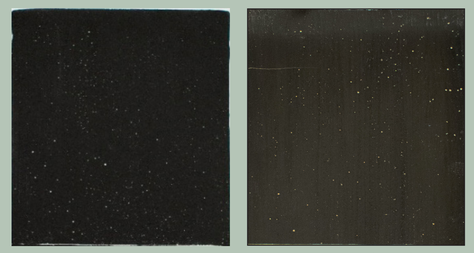
The research was performed with an experimental design and evaluation of data.
Creation and artificial ageing for 240 hours of mock-ups to replicate the original paint on wooden blocks.
Consolidation of the artificially aged for 120 hours mock-ups with Lascaux's MfC, Aquazol 200, sturgeon glue and JunFunori.
Evaluation of the changes by standardized techniques.



Making of the mock-ups with the traditional technique for egg-white distemper.



Smalt blue + egg white binder mock-ups. Left: before artificial ageing. Right: after 230 hours of artificial ageing.



Lamp black + egg white binder mock-ups. Left: before artificial ageing. Right: after 230 hours of artificial ageing.

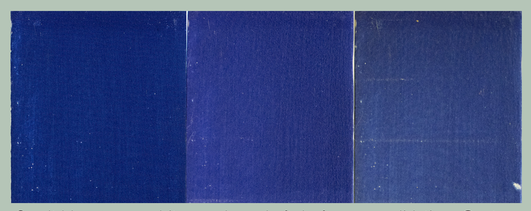
Results

Chemical changes: FTIR
Sturgeon glue showed oxidation.

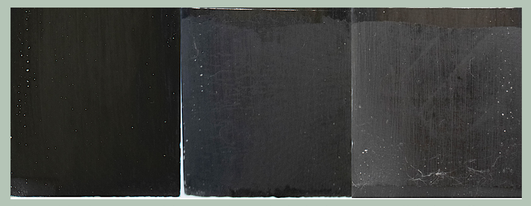
Cohesion rates: SEM and tape test
JunFunori keeps good cohesion after ageing.
Aquazol 200 provided the best cohesion on smalt blue. Lascaux's MfC 25% provided the best cohesion on lamp black.

Changes in gloss: glossmeter
Sturgeon glue gave the larger gloss diference (glossiest), followed by Lascaux's Mfc 25%.

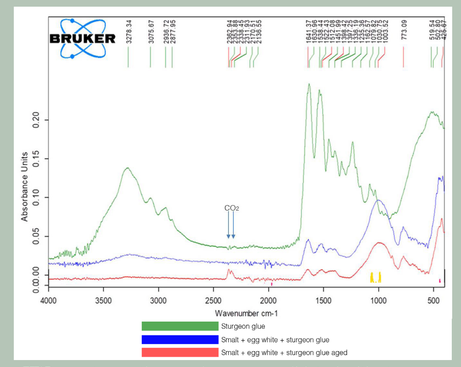
Changes in color: spectrophotometer
JunFunori shows the smallest color change, followed by Aquazol 200.



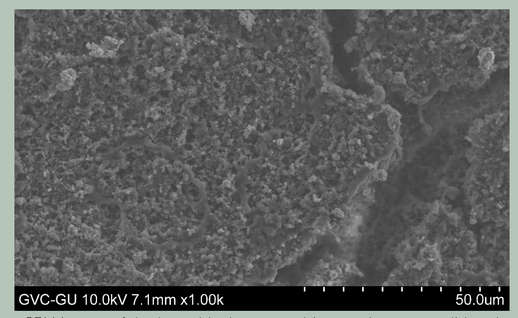
Smalt blue + egg-white mock-up. Left: before consolidation; Center: after consolidation with JunFunori 1%; Right: artificially aged.



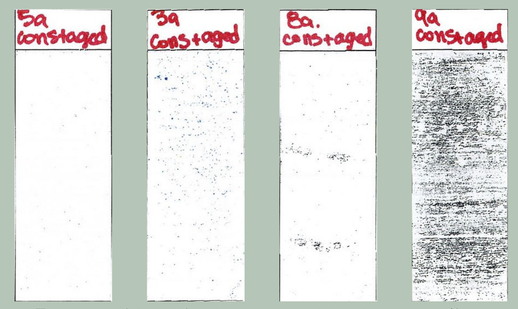
Lamp black + egg-white mock-up. Left: before consolidation; Center: after consolidation with Lascaux's MfC 25%; Right: artificially aged.



FTIR spectra on the mock-ups consolidated with sturgeon glue 3%.



SEM image of the lamp black + egg-white mock-up consolidated with JunFunori 1% artificially aged for 120 hours.



Tape tests of the artificially aged consolidated mock-ups (from left to right); 5a: sturgeon glue 3%; 3a: Lascaux's MfC 25%; 8a: Lascaux's MfC 100%; 9a: Lascaux's MfC 25%.

Conclusions

Aquazol 200 and JunFunori have given great outcomes.
Sturgeon glue showed the least suitable ageing properties.
Lascaux's MfC should be proved in other application techniques.

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