



Making Replicas of Hand-Painted Glass Slides for Magic Lantern Shows

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INTRODUCTION

Magic lantern shows were a pre-cinema delight between the 17th and the 19th century, ranging from scientific and educational lectures to entertainment displays for all ages [1]. Composed of an artificial source of light, a concave mirror and a lens' system, magic lanterns could project any image registered in glass slides [1]. With the appearance of cinema, magic lanterns' shows have diminished, however, those events can still happen nowadays, using historical glass slides [2,3].

Hand-painting on glass required a great technical knowledge since every detail painted would be projected. One of the most important requirements was colour transparency because if the painting layer was too opaque, the images would not be transmitted by the light, and it would only project a black image. Due to these reasons, transparent watercolours, oils and varnish colours were the preferred painting materials [4].

Due to the little knowledge in conservation for these cold paintings on glass, hand-painted glass slides are degrading and losing vital information, especially if they are being used on shows. To preserve these historical glass slides while still maintaining the tradition of magic lantern's shows, the production of replicas is a necessity.



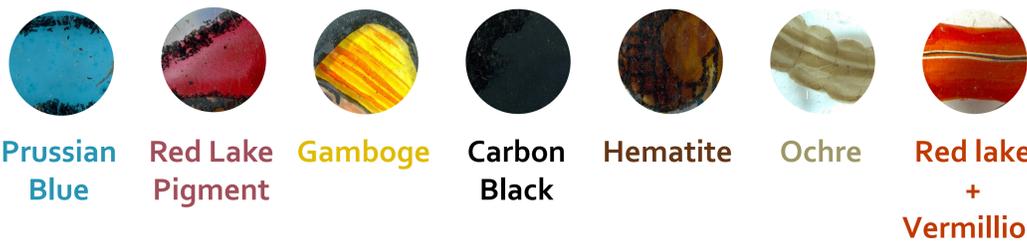
Magic Lantern, Cinemateca Portuguesa, Lisbon. © Teresa Parreira

METHODOLOGY

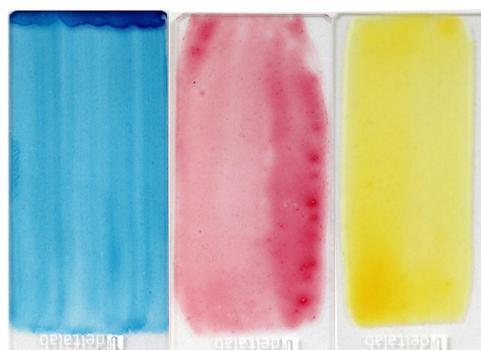
By combining information from written sources and chemical analyses of historical glass slides [5,6], a methodology for replicating hand-painted glass slides was created by experimenting with different binders and colourants mentioned in the literature and found in historical glass slides.

CHARACTERISATION OF HISTORICAL GLASS SLIDES

Using complementary analytical techniques, such as μ -EDXRF, μ -Raman, μ -FTIR and UV-VIS, it was possible to find 7 different colours in 3 historical glass slides. It was only possible to detect the presence of a mastic resin that may have been used as a varnish but also as a binder; however, the presence of other binders cannot be excluded.



PREPARATION OF HISTORICALLY ACCURATE PAINTS



Prussian Blue + Mastic resin
Red Lake Pigment + Gum Arabic
Gamboge

The colourants chosen to be experimented with were **Prussian blue, red lake pigment, gamboge and ivory black**. In addition, a **mixture between gamboge and Prussian blue**, found in the literature and previous analyses, was also prepared.

The binders were also selected based on the literature: **gum Arabic, linseed oil and mastic resin**. PVAc was also chosen to observe how a modern binder could behave with the colourants and if it could be an option to produce replicas.

The different paints were prepared considering the analytical results obtained from the historical magic lantern glass slides. They were applied on small glass slides, making a total of 5 samples of each colourant with the different binders.

The paint samples were then submitted to projection and adhesion tests, respectively, that examine their transparency and adhesion to the glass. The projection tests were made with a Reflecta Cubus 401 projector in a dark room, with little to no light interference and the adhesion tests followed the European norm of Paints and varnishes – Cross-Cut test (ISO 2409).

The results showed that mastic resin had the best results as it proved to have good adhesion to the glass and offered good transparency to the paints. It even added some transparency to the gamboge and mixture of gamboge and Prussian blue samples (made with water as a binder) as it projected an opaque colour without it.



Projected image of a gamboge's sample where it was applied mastic resin as a top layer, turning it more transparent, allowing the projection of its colour.

PRODUCING A REPLICA



The replica of a historical glass slide will be prepared first with printed outlines and then, hand-painting the details. The printed outlines will be made in partnership with colleagues from the Fine Arts Department of the Porto University (FBAUP).

Following the results from the preparation of the historical accurate paints, mastic varnish will be the first binder to be tried with the colorants to produce the hand-painted replica of this historical glass slide.

This work will enable the production of replicas of hand-painted glass slides for various purposes, including magic lantern shows and dissemination activities offered by institutions. Ultimately, this work will significantly contribute to the preservation of these valuable heritage objects while also maintaining the tradition of magic lantern's shows.

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