

Contribution of scientific analyses for the knowledge of 16th century glasses of Sainte-Marie's cathedral from Auch: origin and manufacturing

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Abstract

Among the stained-glass windows conserved in Auch Cathedral (south of France, Occitanie), eighteen, located in the ambulatory, were realised between 1510 and 1513 and signed by the glass-painter Arnaud de Moles. A new restoration of the cathedral started with the chapel of Saint-Louis (2017-2019), soon followed by the other chapels and upper windows of the choir. This project has gathered once more conservation scientists, art historians, architects and glaziers around the restoration and conservation of the building.

The chapel of Saint-Louis has three bays representing holy characters and biblical scenes. The first observations in the studio showed few mending lead and a very good state of conservation. The restoration project included the cleaning, the fixing of broken glasses and the protection of the three windows with protective glazing.

A restoration is always an opportunity to deepen the knowledge of the artwork. This project benefited from a beam time at Accélérateur Grand Louvre d'analyse élémentaire (AGLAE), a particle accelerator developed by the Centre for Research and Restoration of Museums of France (C2RMF, Paris). Non-invasive and non-destructive analyses have been carried on three panels with AGLAE, using PIXE, PIGE and RBS spectroscopies in order to know the quantitative chemical composition of the glasses. The panels were set in front of the instrument, the areas were chosen in association with the art historians and the restoration chart.

The results revealed a very homogeneous composition for all the glasses except for the purple ones. The same pattern was found for the paintings composition thus showing a different treatment for these pieces. Besides, analyses were done in both faces highlighting the use of flashing glasses at least for the red, green and blue pieces. The composition has then been compared with other sites from France. We discovered a similarity with the composition of the stained glasses made in the first years of the 16th century for the Saint-Etienne's cathedral of Sens. Archives from this site are available revealing the glass had been bought from a glassworks in Lorraine. We can then assume the glass sheets used by Arnaud de Moles came from the region of Lorraine, a thousand kilometres away.

The exceptional quality of the glasses and the remarkable preservation of the windows have contributed to a better knowledge on the making processes of the coloured glasses and on the trade networks existing in the 16th century.