



Microclimatic Monitoring of the Sansevero Chapel in Naples: Multivariate Analysis of the Physical and Chemical Data

S. Ridolfi

Scientific Laboratories of Il Tarì, Caserta, Italy

Abstract

It is of paramount importance, for preservation and conservation means, to understand the need of periodic checks to avoid the definitive decay of works of art.

And nevertheless it is not to be ignored the economical cost of the diagnostic analysis that together with a structural lack of funds that are at disposal of the preservation of works of art make the planning of periodic checks very difficult or limited only to the more important masterpieces leaving out the majority of art works.

Introduction

From the scientific point of view a great deal of effort is nowadays put to establish standard operation procedures (SOP's) which can be sustainable in the Cultural Heritage environment. It is useless to program a mass amount of analysis when the environment is not economically able to sustain them. It is more important to set a minimum required number of techniques and methods that with still a strong scientific background can allow to SOP's to be fulfilled with masterpieces together with other more modest art works. A case study of this topic is the diagnostic analysis fulfilled in the Sansevero Chapel in Naples and mainly on the "Veiled Christ" (Giuseppe Sanmartino 1753, from a model of A. Corradini)

Co-operatively with the management of the Sansevero Chapel [1] that put in agenda a periodic control of the conservation status of the Chapel, a working procedure is being established to fulfil the requested task.

Indoor monitoring is necessary in space with collection of cultural heritage objects, principally if in the collection we found two of the most famous and impressive marbles with veiled figures in the world, the "Veiled Christ" and "The Chastity" (Antonio Corradini, 1751).

Materials & Methods

Availing of transportable EDXRF and RAMAN systems together with microclimate sensors a spatial and chronological map of a set of chosen parameters linked to degradation processes are being drawn.



Fig. 1, A. Corradini, The Chastity, dedicated to Cecilia Gaetani dell'Aquila d'Aragona, mother of Raimondo de Sangro

In the chapel are installed some portable sensors to monitoring Temperature, Humidity, Dew Point, Carbon Monoxide (CO) [2] running 24h with sampling rate of 1 minute (Lascar, El-Usb-2 and El-Usb-CO). The air indoor were filtered through a cellulose acetate syringe filter (0.20 μm , JAC-020-25-100, Albet, Barcelona, Spain) by means of membrane pump with 600 mL/min of air flow.

The filter is openend in laboratory and measured with EDXRF custom made instrument and Raman spectrometer.

The last two instruments are also used into chapel to study dust and powder naturally present in surfaces.

To analyze the surfaces portable systems were used. About the EDXRF system we worked with an X Ray tube tension of 35 kV and a tube current of 0.2 mA; the detector is a SDD (Silicon Drift Detector) with a resolution of 150 eV at 6.4 keV. The analysed areas on the surfaces have a diameter of 2 mm [3].

Results

The number of parameters measured are high. It is therefore necessary to use chemometrics analyses to manage and deal the results of the measurements.

In this memory we are going to present mainly the huge amount of results on the "Veiled Christ" in Naples that must be managed together with some highlights on similar material projects and the work in progress SOP's that are being establishing for marble surfaces in an indoor environment.

The project will last until 2009. Data is being collected. The chemometrics method of analyses are shown in this memory.

Conclusions

The environment analysed is kept in a very good condition. Up to now the results obtained showed a good stability in the parameters analysed. This makes us confident that a minimum variation from the conservation point of view will be immediately reported and defence mechanisms can be activated.

References

- 1) Sansevero Chapel Museum, Via F. De Sanctis, Naples, Italy at <http://www.museosansevero.it> accessed Apr/2008
- 2) Lascar Electronics Ltd, Salisbury, U.K. at <http://www.lascarelectronics.com/usb-data-logger.php> accessed Apr/2008
- 3) Diana M., Gabrielli N., Ridolfi S. (2007). "Sulfur determination on stone monuments with a transportable EDXRF system", X-Ray Spectrom. 2007; 36: 424-428