

DOCUMENTATION AND ANALYSIS OF THE COLOURS IN THE ARCHITECTURAL ELEMENTS OF THE ST. SEPOLCRO OF ACQUAPENDENTE (ITALY)

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ABSTRACT

In this paper the study of the 'painted architecture' in the mediaeval crypt of Santo Sepolcro (Holy Sepulchre) in the Cathedral of Acquapendente (a little town in Central Italy) will be reported and discussed. The aim of the paper has been to: map the traces of original painting still visible on the stone frames and capitals of the crypt, and analyse the pigments and binders for a possible reconstruction of the original appearance of the decorations. To reach the established goal, in situ documentation was performed through visible and ultraviolet fluorescence photography. Then painting samples were taken for laboratory analysis aimed at identifying pigments and binders.

Keywords: medieval crypt, pigment analysis, ultraviolet fluorescence photography, digital documentation

INTRODUCTION

The crypt of Holy Sepulchre of Acquapendente has been dated back to the 9th-10th century and is divided into nine naves by twenty four columns some of which still exhibit the original capitals (Fig. 1) [1-3].

The great relevance of the crypt is linked to the presence of the Holy Sepulchre, also named sacello (sacellum), which is considered by several historians to be the oldest copy of the Holy Sepulchre of Jerusalem still surviving in Europe [4].

By carefully observing the architectural elements of the crypt, it is possible to see a lot of colour traces that may be referred to the original painting apparatus (Fig. 2) [2, 5]. The first step of the research consisted in the carefully mapping of these traces by visible and ultraviolet fluorescence photography (UVF), this last being particularly useful to highlight the possible presence of organic materials. X-ray fluorescence spectroscopy (XRF) was also performed for pigment analysis. After these non-invasive analyses, eight micro-samples were taken for laboratory analysis through optical microscopy and Fourier transform infrared spectroscopy in order to investigate the painting stratigraphy and characterize the composition of pigments and binders.

OPERATIONAL GOALS

In situ documentation

Visible and ultraviolet fluorescence photographs were performed by a Nikon D5300 digital camera equipped with 18/105 mm multifocal zoom lens. For visible acquisitions, the lighting of the surfaces was obtained through 250 W incandescence lamps. For UVF acquisitions, two 365 nm filtered sources, operating at 3000 mW, were used. On the camera optics Kodak Wratten 2B filters (light yellow) and 85B (amber filter) were mounted, in order to eliminate the reflections of the UV and attenuate the dominant blue typical of ultraviolet shots.

XRF spectroscopy

X-ray fluorescence spectroscopy was performed by the portable equipment Surface Monitor (AssingTM). The measuring conditions were the following: Mo tube operating at 25 kV and 300 μ A beam current; scan time 120 s; distance 95 mm.

FTIR spectroscopy

Infrared spectra were obtained using a Nicolet Avatar 360 Fourier transform spectrometer. For each sample 128 scans were recorded in the 4000 to 400 cm^{-1} spectral range in diffuse reflection modality (DRIFT) with a resolution of 4 cm^{-1} .

Optical microscopy on painting cross-sections

Observation and photography of the sample cross-sections were performed by a Zeiss Axioskop