AN APPROACH TO CLEANING METHODS AND MATERIALS FOR PAINTED ALABASTER

The relief of Saint Jerome Penitent from Cathedral of Salvador in Zaragoza (Spain)

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The behaviour of polychromies on stone as dynamic and complex structures is not fully determined yet: the factors and processes that influence its alterations on inorganic porous systems under different environmental conditions has to be well understood.

As a result of the reactions between the constituent materials of the painted films and the lithotype, in search of a new physical and chemical equilibrium with each other and the surrounding environmental, many alteration products (by-products) of inorganic, organic or mixed nature arise [Fig.1]. These reactions determine a new composition of the painted films and as a consequence several changes occur in their chemical properties such as pH, conductivity and solubility.

The changing properties of painted alabaster during aging

It’s well known now that aging of film forming materials, (fillers, binders, pigments), doesn’t generates the same decomposition products on stone like generates on wood, linen or other organic supports. Moreover, it is still not known if painting materials react with alabaster in a different way than with other lithotypes such as marble, sandstone or limestone.

This research is aimed to find scientific data to confirm these changes, study the particular transformation suffered by the aging of polychrome alabaster and develop intervention methods, more specifically cleaning protocols, with respect to the nature of these layered complex structures.

To this propose, a 16th century alabaster relief of Saint Jerome from Cathedral of Salvador in Zaragoza, Spain, which has been intervened in Escuela Superior de Conservación y Restauración de Bienes Culturales de Aragón, was taken as a case study [Fig.2]. There has been also prepared mock-ups on different supports, (alabaster, glass, wood and linen), elaborated with similar film forming materials to the ones found in the case study [Fig.3 and 4]. They will subject to the artificial aging to obtain a deeper understanding of both the physicochemical properties of the constituent materials of painted alabaster and some of their aging mechanisms with analytic technics such as microscopy, Fourier transform infrared spectroscopy, x-ray diffraction, x-ray fluorescence and scanning electron microscopy.

Surface cleaning as a function of surface properties

The removal of soils and other substances deposited on the polychrome surface is one of the treatments conservators usually must deal with when treating painted alabaster. Since these treatments involve direct contact with the surface, they might have consequences that affect not only the material integrity of the sculpture but also the visual appearance of the surface. Therefore, a good understanding of both the forces of adhesion between the surface and the soils and of the environmental conditions are necessary prior their removal.

According to this, common surface cleaning methods developed for other supports might not suit well with stone and especially alabaster, since the properties that the polychrome layers acquire over time are different according to the type of support, the painting materials and the environmental conditions.

This is a preliminary step to understand and develop an approach to cleaning methods and materials for polychrome alabaster that respects and preserves the properties of such materials but, equally interesting, that guarantees the absence of toxicity for conservators.

Acknowledgements: The authors wish to thank Agar-Agar Produtos de Conservación y Restauración, Hospital Provincial Sagrado Corazón of Jesús de Huesca, Mr. Christopher Marques and Mr. Ignacio Sebastián Ruiz Hernández.

Fig. 1 - Microscopic photography of prepared mock-ups after aging.

Fig. 2 - 16th century relief of Saint Jerome located from Cathedral of Salvador in Zaragoza. (71,5 cm x 88,5 cm x 17 cm)

Fig. 3 - Mock-up with similar film forming materials on alabaster.

Fig. 4 - Microscopic photography of prepared mock-ups after aging.