OIL PAINTING ON STONE: A CASE STUDY ON ORIGINAL TECHNIQUE AND DETERIORATION OF AN EARLY 20TH CENTURY PAINTING BY GIUSEPPE CALÌ IN MALTA

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ABSTRACT

Maltese wall paintings from the Baroque period onwards were mostly executed in oil or oil-based media applied directly to local limestone (Globigerina Limestone), which is a soft, very porous stone (porosity ~ 40%). These paintings are often found in a poor state of conservation. One such painting on a dome of a church located near the island’s harbour was chosen as a case study. Painted in 1903 and heavily restored in 1963, the painting’s advanced state of deterioration made it an excellent example to review/examine and understand the most common effects and processes of deterioration related to similar wall paintings, and thus to provide essential information for establishing a proper conservation strategy. The investigations carried out on the original materials and technique of the painting also shed light on an artistic period characterized by the use of a large number of new and often unpredictable materials.

The paintings were extensively documented graphically (ACAD) and photographically (including ultra-violet light). Samples were taken to identify both the painting materials (original and non-original) and the products of deterioration (including soluble salts). The techniques used to identify painting materials included light and electron microscopy, as well as instrumental analytical techniques, in particular XRD and GC-MS. SEM, IC and XRD were used to identify soluble salts taken from both the surface of the painting and at different depths (core sampling). Internal and external ambient temperature and relative humidity were also monitored over several months to understand the role played by the environment.

The analyses of the painting materials revealed the use of chrome-containing pigments and pigment combinations likely to be related to ready-made mixtures. The binding media were found to include both linseed oil and beeswax. Visual examination and scientific investigations have shown that the fabric of the building had already suffered severe deterioration prior to the chapel being painted by Giuseppe Calì in 1903. The main products of deterioration were identified as soluble salts, mostly sulphates and chlorides. Sulphates are related to old repair materials, pollution and infiltrating rainwater, whereas chlorides are linked to sea aerosols. The research is still ongoing and further results are expected to shed further light on the deterioration processes under way.

This research has shown how the deterioration of Calì’s painting is due to both the intrinsic properties of the constituent materials, including the very high porosity of Globigerina Limestone, and external factors, such as pollution and climate. An important role is also played by the original stratification of the painting, and the restoration materials as well as the lack of maintenance of the fabric, which caused water infiltration. This last factor leads to the
consideration that the constant and careful maintenance of the fabric, along with very close monitoring of the painting’s condition, seem to be the real and essential keys to achieve the long-lasting preservation of oil painting on Globigerina Limestone.