

THE “SCREAM” BY EDVARD MUNCH - SAME MOTIF, DIFFERENT COLOURS, DIFFERENT TECHNIQUES AND APPROACHES – A NOVEL NON-INVASIVE COMPARATIVE STUDY OF TWO OF ITS VERSIONS

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Background

Edvard Munch (1863–1944) is widely known as being the author of the “Scream”, iconic representation of despair and anxiety of humankind. He made variations of this motif in different techniques; four of which were painted/drawn on cardboard: two at the Munch Museum (MM), one in the National Museum (NM) of Art in Oslo and the fourth in a private collection in the United States. The Munch Museum also possesses six lithographs (including a hand-coloured one) and three sketches on paper. A disagreement between art historians about the dating of the two painted versions, one in National Museum of Art and the other in the Munch Museum, initiated a wide-ranging investigation which is still going on.

The most famous of the two “Scream”-versions on cardboard in the Munch Museum collection (MM, 1910?) was extensively investigated on several occasions (1974, 1992, 2004, 2009, from 2011 up now) [1-3]. These analytical approaches used mainly micro-destructive techniques (XRF, XRD, SEM-EDS, FTIR, GC-MS, and staining tests on cross-sections observed under optical microscope) [4], but also multispectral and other screening techniques (Vis, UV, IR and false colour photography, X-ray radiography). Recent analyses were performed at the Wintherthur Museum with the aim of examining the colour change in the areas painted with cadmium yellow[5]. 36 cadmium yellow paint tubes of different brands were also sampled and analyzed on this occasion.

A first comparison of two of the painted versions of the “Scream” was published in 2008 [2]. This study focused on the National Museum’s version (NM, 1893) which is believed to be Munch’s first, and the version belonging to the Munch Museum (MM, 1910?). The investigations concluded that the paint media in the NM version consist of water based tempera (casein, egg and some drying oils), with wax crayon on cardboard. The MM version is also executed in mixed media (tempera, casein, oil, glue and resins were identified) on cardboard. In the 1910 (?) version, there is a drawing beneath the paint layers,

whilst in the 1893 version, no visible underlying sketch is detectable. Munch appears to have painted directly onto unprimed supports; both paintings are unvarnished.

Aims

The MOLAB access [6] was granted in 2017 through IPERIONCH project, for the study of six versions of "Scream" belonging to the Munch Museum. Two of the analytical techniques used (macro-XRF and XRD) for this purpose, were also applied on the version from The National Museum. Thus the comparative study of the two versions of the Scream (NM, 1893 and MM, 1910?) benefited also of this non-invasive approach.

This research and access project made use of advanced analytical techniques such as macro-XRF, hyperspectral VIS and NIR imaging and other complementary non-invasive tools (UV-Vis fluorescence, XRD, Raman and reflection FTIR spectroscopies). The results summarized in this paper show the completely non-invasive approach carried out on these objects.

Major Findings

The investigations provided new and more complete data of the paint and drawing materials and the artistic techniques of the examined art works in comparison to previous studies. In particular the invisible layers beneath the surface and the way Munch applied his paint materials, the pigment choices and mixtures he made, the posterior interventions on both paintings have become clearer by employing this novel multi-technique approach.

Macro-XRF was particularly useful to map the different elements on the surface of both works of art and to illustrate the differences in the way Munch applied the colors, as for example, in the sky areas, where brush strokes of pure paints are sometimes overlapping mixture of them. The presence of specific elements in the cardboard and in the paint layers was also mapped.

In addition, Vis hyperspectral imaging integrated with X-Ray diffraction, reflection FTIR and Raman point measurements at several locations on the paint surfaces allowed to establish correlations between layers of paint and the pigments and additives present in them. Pigment maps resulted from the spectral classification provided one to one comparison between specific/mixture of pigments in both versions. Specific orange fluorescence in several areas of orange color can sometimes be attributed to the altered cadmium yellow, already known as being responsible for its fading (MM 1910?). X-ray diffraction confirmed the cadmium sulfide in orange areas. The red areas of both versions showed identical X-ray diffractograms, characteristic of vermilion (HgS). Ultramarine was also found in the blue areas of both versions, and hydrocerussite in the white areas of the NM paintings. Oxalates were also identified in several points on the MM Scream.

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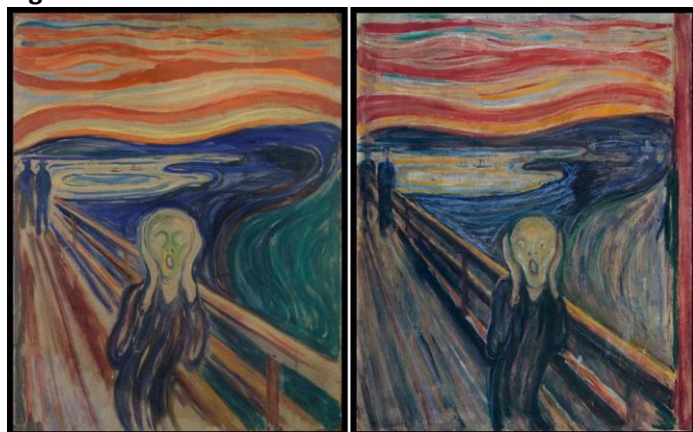
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Figures



MM Scream c. 1910
Tempera and oil on
cardboard

NM Scream 1893
Tempera and crayon on
cardboard

