

The examination of paintings by Rembrandt with Neutron Autoradiography

Tuesday, 10 September 2013 09:30 (40 minutes)

The evaluation of autoradiographs of paintings by Rembrandt with a comparative study of the painting with the stereoscope leads to diverse consolidated findings for art historians and conservators.

Results of Autoradiography and scanning macro-XRF will be compared.

Summary

For over thirty years, neutron autoradiography is in use for the examination of paintings from the Gemäldegalerie, Staatliche Museen Berlin, in cooperation with the Helmholtz Zentrum Berlin. It expands the spectrum of colours by a multiple whose distribution in deeper layers of paint can be made visible. Together with the X-ray photograph and infrared reflectography a comprehensive insight into the genesis of a painting is made possible. By additional application of γ spectroscopy the darkening on the autoradiograph can be assigned to special isotopes. The use of film allows a particularly good reproduction of the brush stroke, the technique of paint application and the conservation status (condition) of the painting. Autoradiography therefore provides art historians and conservators with a wide scope of possible interpretations.

By now about 70 paintings have been examined, mainly those by Rembrandt and his circle, but also works by Vermeer, Titian, Jan Steen, Frans Hals, Rubens. The paintings by Rembrandt hold a special interest, because he is a painter who repeatedly makes changes during the creative process in search of satisfactory composition. The progress of his quest can be read on the autoradiographs. The interpretation of the achieved goal, which we see as a finished work before us is thus provable and no longer subject only to personal hypothesis.

A problem in the interpretation of determining the genesis of a painting, however, is that the darkening of the film illustrates a summation of the radiation from all layers of paint.

Difficult is the determination of the depth of the radiation within the paint layer structure and how many layers of paint are involved. It is therefore imperative for the evaluation of the autoradiographs to perform a simultaneous examination of the painting with the stereoscope.

Thanks to funding from the Andrew W. Mellon Foundation the autoradiographs will be evaluated in a wholly interdisciplinary manner. The results will then be made accessible to the broader public in digitalized format within the context of the Rembrandt Database.

In the talk, some examples will be presented of already fully examined Rembrandt paintings that prove the painter's ingenuity and creativity.

Also there will be a brief report from a test: For several years deeper layers of paint can be made visible with the help of a XRF scans. Matthias Alfeld of the University of Antwerp has scanned paintings in the Gemäldegalerie, of which there are already autoradiographs available. The goal was a direct comparison in order to determine the advantages and disadvantages of both methods.

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