

Technical and Technological Features and Analysis of Painting Specifics from the Resurrection Church of the Derevyanitsky Monastery in Veliky Novgorod (Russia)

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The Resurrection Church of the Derevyanitsky Monastery in Veliky Novgorod (Russia) is a cultural heritage site of federal significance. It was built in 1335 at the direction of Novgorod Archbishop Moses and painted in 1348. During its existence, the monument was repeatedly rebuilt, and only the main part from the 17th century has survived to this day. Currently, the church building is rapidly going to decay and urgently needs professional restoration. In 2013-2015, an archaeological expedition from St. Petersburg State University worked on the site, where a lot of fragments of wall paintings were discovered, presumably dated 1348. Within this work, 71 archaeological fragments were studied at the Laboratory of Neutron Physics of the Joint Institute for Nuclear Research. Samples were analyzed using neutron activation and X-ray fluorescence analysis, infrared and Raman spectroscopy, stratigraphy, and polarized microscopy. In addition, statistical analysis was used. As a result of the study, the set of main pigments used was revealed: yellow and red ochres, cinnabar, green earth, azurite, carbon black and lime white. The presence of blue smalt pigment was unexpected and did not correspond to the preliminarily dating all fragments to 14th century. Also the structure of the wall painting was determined. In most cases, a levelling layer was applied over the plaster. The number of color layers varied from 1 to 3. Using neutron activation analysis, it was found out that lime is the main component of the plaster bases. The statistical analysis of the mass fraction of the main macrooxides clearly separated the "lower" and "upper" plaster layers. According to infrared spectroscopy, protein was found in the color layers as a binder. Thus, it was established that the painting was made in the tempera technique.