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RED WAX SEALS: RECONSTRUCTION OF HISTORICAL TECHNOLOGY

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The results of a comprehensive study of red wax pendant seals attached to the Russian documents of the late 15th - early 18th centuries are presented. Seals of adjacent territories were used for comparison of dyeing technologies for Western European and Russian wax seals.
Since the seals included a variety of organic and inorganic materials according to historical recipes, the set of methods included: X-ray diffraction phase analysis, scanning electron microscopy with energy-dispersive X-ray microanalysis, inductively coupled plasma mass-spectrometry, gas chromatography, IR-spectroscopy. Experimental techniques were testing out on model samples of red seals made from modern beeswax with the use of various pigments: red lead, cinnabar and white lead.
A study of historical seals showed that beeswax, resin and cinnabar were used in the manufacture of European seals in full accordance with historical recipes. The composition of Russian seals of the 15th-17th centuries differs from the list of materials purchased for the needs of the Posolsky Prikaz (Ambassadorial Prikaz) responsible for the manufacturing of state charters. The composition for the seal of Peter the Great (a mixture of beeswax, resin, cinnabar and red lead) is consistent with the recipes for Russian seals of the early and mid-17th century. It was found that the presence of lead in the samples is not always associated with coloring pigments.
Thus, an evolution in the Russian practice of making red wax seals with some difference from synchronous European recipes was traced

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