

White, yellow and green pigments on Polish artist's palettes in the period 1838-1938

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The 19th century evolution of chemical composition of whites, yellows and other pigments was stimulated by numerous chemical discoveries. Dates of the inventions and patents are well established thanks to the preserved documents, catalogues and literature.

The survey of more than 200 hundred Polish artists' paintings from the years 1838 - 1938 proved significant shifts between the date of invention of the pigment and the moment of its implementation by artists. According to the gathered data the year opening reported period (1838) is the moment when viridian was for the first time used on the painting. A century later (1938), titanium white was implemented by Pankiewicz. Among artists examined within the research were: P. Michałowski, W. Orłowski, J. Matejko, W. Gerson, W. Kostrzewski, W. Szementowski, W. Malecki, W. Pruszkowski, J. Mehoffer, S. Wyspiański, L. Wyczółkowski, J. Chełmoński, W. Weiss, F. Pautsch, J. Malczewski. Such wide range of painters allowed to build chronological database of the dates of the first use of individual kind of pigment, period of its especially intensive exploitation and in some cases of subsequent absence of the pigment on the palette.

Portable XRF and complementary Raman spectroscopy and SEM-EDX analysis (when sampling was possible) allowed to establish some turning points like the first use by Polish artists of zinc white, cadmium yellow, zinc and barium yellow, emerald green and viridian. In the same time minor changes and the technological evolution of pigments were observed: modification of Naples yellow by zinc or tin based admixtures in the second half of the 19th century (in opposition to pure lead antimonite in its first half), or variety of additions to basic lead white changing with time (chalk, barites, zinc white, lithopone or aluminium based compounds). Innovative approach was to confront information on the evolving palette with the results of identification of fillers of the priming. When pigments and priming were recognized together, it significantly strengthened precision and accuracy of the material examination based dating and authentication.

Conducted research started to build panorama both of the turning points and more fluent changes within the practice of use of some pigments and grounds by Polish painters in the period 1838-1938. In some cases it indicated characteristic habits of individual artists.

Gathered data is a solid source for comparative studies for modern Polish paintings of unknown origin. The survey is going to be continued and broadened.

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