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Alfons Mucha: The Slav Epic. Technological and restoration survey

ANNOTATION

The article presents a restoration survey of twenty paintings of the Slav Epic, carried out at the end of 2016 by photographic and laboratory methods, archival research and evaluation of current knowledge. The author based his work on preparatory drawings, historical photographs and, above all, the opportunity to examine the paintings, exhibited at the Veletržní Palace in Prague. The survey compared outcomes of the optical and photographic processes with laboratory analysis of samples. Ultraviolet rays revealed various stages of repairing Mucha's work in the 20th century, and x-rays showed a gradual transition from tempera to oil painting and the increasing use of lead white. This was confirmed by chemical analysis and analytical methods in the number of samples taken from the last years of the cycle. Stratigraphy revealed a very thin undercoat as well as fine layers of the paintings.

The survey was carried out before the exhibition was de-installed and the paintings were rented to the National Art Center in Tokyo, Japan and, among other things, was to answer the Prague City Gallery's question whether the works could be rolled over and transported overseas. The present paper shows how such a technological survey can reveal the author's preparation and his contribution to future dealing with the work.

SUMMARY

Exhibiting twenty paintings of *The Slav Epic* cycle (1912–1926) by Alfons Mucha (1860–1939) at the Veletržní Palace in Prague allowed a thorough technological research of the whole work for the first time in its history, using modern scientific methods and analysis of materials. The applied methods primary examined the circumstances of the origin and the painting technique rather than mapping the damage of the works. The main aim of the research was to describe in maximum detail Mucha’s painting techniques and materials used to create such a large-scale work and how he modified them during the 16 years he worked on the *Epic* cycle. The research included X-ray imaging, ultraviolet ray survey, laboratory material research, and the acquisition of sufficient number of macrophotographs which could be carefully compared with other details of the painting. Due to the large size of the paintings and their number, only some of the works were selected for the survey, characteristic of the particular year of creation. The selection thus covers the entire period of the creation of the *Epic*. The paintings were documented in a detailed 300 dpi print quality in 1 : 1 format. Jan William Drnek photographed individual paintings by a series of 200–350 images, using a highly sophisticated and mathematically controlled method. The photographs and laboratory results can be used for further interpretations in the future.

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The paintings have traveled many times throughout their century-old history, always in a rolled-up state, as Alfons Mucha intended from the beginning. He subordinated the whole process of the creation of his life work to this purpose and meaning. The actual painting on large canvases was preceded by Mucha's broadly conceived, thourough preparation of individual themes, which even among outstanding artists is not commonly encountered. Mucha transferred the preliminary sketches to very strong canvases from Belgium, originally woven for sails. Their cross-weave is in some cases woven with double threads, which certainly supported the material strength. By choosing the canvas, Mucha clearly declared that he was well aware that any manipulation with the paintings would only take place in the rolled up state. By painting on a solid and stable surface, he ensured the durability of the work for future generations.

For the rest of his life, Mucha retained some right to store, modify and repair the paintings, finish and refine them, if circumstances required, even after the Epic was handed over to the City of Prague. He last restored the paintings in 1937.

A detailed inspection of the work revealed the way of its origins. The technique of the *Slav Epic* painting, seen

through the X-ray imaging, is not of a common nature. In contrast to the usual imaging depicting mainly substiantially seen objects, here we see weak reflections of figures and especially lines of silhouettes, outlines of individual forms and objects. X-ray radiographic research clearly showed that the author was very careful not to laminate the paint layers and to use the brightness of pigments in the thinnest layers. The whole structure of the painting is composed of two to three thin, finest layers as possible. Also, the chalk undercoat is very thin and does not exceed two tenths of a millimeter in thickness. According to a visual inspection, this undercoat is rather of a chalk character, materially identified as a mixture of chalk and predominant zinc, later lead white. The survey, already at its beginning, clarified the great turning point in painting techniques caused by the first exhibition of part of the cycle in Prague and the United States (1921), at a time when all the largest formats were painted. This fundamental turn of tempera/oil painting is evident between 1918 and 1924. In the early years of his work, Mucha used tempera techniques. Also laboratory surveys revealed mainly protein bonding agent in the painting of the first period. Starting with the tempera technique meant for Mucha the setting of a high bar, using a time-consuming technique with the necessity to deposit very thin layers. Tempera was deliberately chosen for the future scrolling of paintings for transport. Oil painting became Mucha's main artistic technique after his return from America. This is evidenced by the use of lead white, most applied in oil painting. Though Mucha dropped the tempera, he was able to adapt the oil painting to serve his intentions – using it without pasty deposits, applying rather fine glaze tones in a few layers. Compared to the tempera he achieved a more global and faster processing of the paint matter. He also made repairs to older canvases with oil paintings.

Alfons Mucha calculated with future scrolling and relocating of the *Slav Epic*, and his invention secured the durability of this admirable work.

Fig. 1. Photographing high-resolution images by Jan William Drnek in December 2016. **All figures** in this article photo T. Berger, 2016, if not stated otherwise.

Fig. 2. Paintigs of *The Slavic Epic* cycle, the year of their origin and the applied survey. Only the images with characteristic results were selected from the total amount of images taken in the survey. **Violete** – ultraviolete survey, **blue** – macrography, **pink** – stratigraphy, **grey** – radiography, **green** – bonding analysis.

Fig. 3. Details of *The Celebration of Svantovít on Rügen* (1912). One of the first paintings of the *Epic* painted mostly by tempera technique. Faces of the characters are undoubtedly based on photographic models, the yellowish haze is made in glazingly dense paint, scarf at the **bottom** is distinctly modeled with a fine hatch in a water bonding medium.

Fig. 4. Details of *Jan Milíč of Kroměříž* (1916) painting. The draperies above are modeled by a system of small hatches creating an impression of illustration. In the detail **below**, modeling with a similar hatch would be less remarkable, and therefore the lights were reinforced with white in strokes with a semi-dry brush. The resulting material of the garment appears to be a much coarser fabric (in the painting), because the painting technique revealed the rough canvas used for the painting, originally intended for sails.

Fig. 5. Details of the painting *After the Battle of Grunwald* (1924). The **top** photo represents the unfinished part (in oil painting). On the **left** there is the modeling only in the initial form, in the **centre** the shapes of the folding system were applied over the cardboard onto the undercoat and on the **right** there is the finished part with the final modeling. **Below** is another part done also as an oil painting, as evidenced by soft gradients in the tonality of colours.

Fig. 6. Details of the only unfinished painting – *Oath of Omladina under the Slavic Linden Tree 1894* (1926). The only unfinished painting of the cycle illustrates well the master's painting technique. The author transferred a careful drawing of the composition on the base layer, with everything laid out in detail. In the first painting layer, individual details were underlined with a uniform colour. The details were added in additional layers and thus only the first composition plan was completed. The dense consistency of the colours allowed them to be mixed in one layer. As the work progressed, the author added more and more minor details. At the **bottom right**, blue is only the primary coat for never completed further layers. Oil painting.

Fig. 7. The same detail of the painting *Celebration of Svantovít on Rügen* (1912) in the visible spectrum (**above**) and ultraviolet (**below**). The detail was chosen as a good example of painting techniques, but also to present two types of restoration in recent years. Coarse strokes of light fluorescent paint (**bottom painting**) are the author's corrections from the late 1930s, done with the painter Zahel. At that time the paintings were stored in the school U Studánky, where they were damaged. Fine retouching (**black**) comes from repairs in the 1990s.

Fig. 8. Detail of the painting *Jan Milíč of Kroměříž* (1916; in visible spectrum at the **top** and ultraviolet **below**). Different illumination reveals the technique with rich modeling drawing, but also later repairs of the painting. The rough strokes in the greenish hues do not correspond to the original, but their colouring completely fits into the

painting, probably from the time when Mucha himself repaired the paintings before World War II. Evident use of oil painting and zinc white. Correction of scratches on the girl's back with a gentle retouching is later, probably from the 1990s.

Fig. 9. Detail from the painting *The Meeting at Křížky* (1916; in the visible spectrum at the **top** and ultraviolet **below**). Different illumination reveals the elaborated method of the draftsman-painter in creating a number of detailed facts in the immaterial distances of the picture composition. Ultraviolet image better illustrates the gradual layering of particular colour areas and several ways of drawing conception to create detail and space. In the visible spectrum the procedure is covered by the true colour of the painting.

Fig. 10. Detail from the painting *The Slavs in Their Original Homeland* (1912; in the visible spectrum at the **top** and ultraviolet **below**). Different illumination showed the author's wide palette of the brush motion. The tempera technique is not suitable for spreading the paint into colour gradients. Here, however, Mucha demonstrates how the rich layering of blue strokes of similar colour (but of a different chemical composition) creates a grassy landscape in the night light.

Fig. 11. Detail from the painting *The Printing of the Bible of Kralice in Ivančice* (1914; in the visible spectrum at the **top** and ultraviolet **below**). Different illumination reveals how much the painting was repaired, rather improved, after being damaged by vertical leakage. In correcting the vertical line, unpleasantly affecting approximately one-third of the picture between the figures, the collar of the scholar on the right was better worked out and several new colours were added to the gloss of the boy's hat. Foliage on trees in the background was also added. The complexity and innovativeness of the restoration lead to presumption that Mucha himself carried out the repairs and additions with a later proven oil technique.

Fig. 12. Different illumination of the detail of a boy's face in *Mont Athos* (1926; visible spectrum at the **top** and ultraviolet **below**). The painting, made in the last year of creation entirely by oil painting. The vibrancy of colours in the lower image is provided by zinc white, an important colour for the faces. Spreading of colours in soft gradients completely lacks the calligraphic linearity of modeling hatches, unlikely the earliest works.

Fig. 13. Detail of a boy on the last, unfinished painting *The Oath of Omladina under the Slavic Linden Tree* 1894 (1926), photographed in two spectra, illustrates phases of the work. The background contains only the first yellow layer with a traced handwriting, while the boy's face and muscles contain modeling, greatly influenced by the original preparatory photo. The preparatory dotted lines can be seen in the detail, which Mucha transferred repeatedlyfrom the cardboard. Intense red in ultraviolet fluorescence indicates the presence of cadmium in the color.

Fig. 14. Macrograph of the X-ray image of the canvas. **A** – *The Slavs in Their Original Homeland* (1912), cross-weave with two threads; **B** – *Celebration of Svantovít on Rügen* (1912), cross-weave with two threads; **C** – *Petr Chelčický* (1918), cross-weave with two threads; **D** – *After the Battle of Grunwald* (1924), single-thread cross-weave.

Fig. 15. Detail of *The Introduction of the Slavonic Liturgy in Great Moravia* (1912) is a good example of Mucha's drawing virtuosity in painting. Both figures are created by a number of individual strokes by fine tempera layers in different shades. Individual strokes have sharp outlines, proving water dilution. The absence of colour pastes, even in extremely contrasting painting, proves Mucha's awareness of the only possible transport in a scrolled form. The economy of the design (simplicity), almost incomplet on many places of the composition, can be seen on the right (preparatory pencil strokes). Also, the ubiquitous structure of the canvas, visible on the X-ray, represents the economy of painting layering. The ginger head from the rear is, according to the X-ray image, an added detail.

Fig. 16. Detail from the painting *Celebration of Svantovít on Rügen* (1912) presents mother's hands and a baby wrapped in white drapery. Different materials are expressed in a similar way by laminating fine glazes. Thin tempera coatings leave sharp outlines, but these are often masterfully loosened in soft gradients. The intangibility of the glazes is evidenced primarily by the regular weave of the canvas, protruding on the colour image, in the X-ray shown as regular black dots. The intangibility of white glazes in the X-ray is due to their slightness and the choice of zinc white.

Fig. 17. The *Petr Chelčický* painting (1918) is painted by tempera technique, with well visible sharp interfaces between individual colours. A characteristic feature of this paintintg is the regular crackling. The X-ray shows individual strokes of thin paint, both on the surface of the body lying down and on the drapery, which alltogether create the modeling of spatial perception of the scene. The bright silhouettes of the main shapes are a good example of recording by tempera painting.

Fig. 18. The radiograph shows the boy's head in the foreground of the scene from *The Oath of Omladina Under the*

Slavic Linden Tree 1894 (1926). Although this is the only unfinished painting in the cycle, the boy's head has all the attributes of finished painting, as we know it, for example, from *Mont Athos* (1926). Incompleteness is a unique opportunity to look into the gradual layering of painting. Especially in the upper part there are only the first touches of colours on the cream-white undercoat. It is an oil painting – soft gradual gradients of body colour can be seen on the boy's face. Plasticity of the painting is done in the finest layers, not captured by the X-ray. Mainly the silhouettes of figures are apparent, the basis of Mucha's work. The radiograph showed that the boy could have a light coloured shirt with a high collar in the first version of the painting.

Fig. 19. Two comparative X-ray images of white draperies record a diametrical difference in the tempera painting technique (*Petr Chelčický* **above**, 1918) and oil painting (Af*ter the Battle of Grunwald*, 1924 **below**). Above, sharp gradients between the individual colours are obvious, where the zinc white in particular creates a black and white picture of the painting. Its layer is very fine and records the structure of the canvas. In the painting below, the author modeled the drapery by semi-dry strokes, choosing soft gradients, and finally changed the draping completely. This is the only painting where the author's changes – the pentiments – were discovered. The compact layer in the shape of the silhouette as the face undercoat Mucha applied in a monumental way.

Fig. 20. Comparison of radiographs of paintings contemporary with *The Slavic Epic*. Different painting hand and layering of the paint mass appears by Jan Preisler (**A** – *Bathing at a Lake*, oil painting on cardboard, around 1909, private collection) and Jože Uprka (**B** – *Feather*, oil painting on canvas, around 1912, private collection), both oil paintings on white undercoat. The lower row shows oil paintings by Alfons Mucha. Layring of the paint is different in the first case (**C**), which is part of *The Slavic Epic – The Meeting of the Youth* (portrait of the artist's son), the second portrait (**D** – *Mother with a Child*, oil painting on canvas, around 1934, private collection), painted by Mucha later, is built in a different way.

Fig. 21. The sample no. 11 – a light on a ship (*Celebration of Svantovít in Rügen*, 1912) – identified zinc white, cadmium yellow, red ocher, Prussian blue, chromoxide, synthetic ultramarine and black in various proportions in the painting layers. Beige undercoat is missing. One scale field represents 0.01 mm (microphoto Markéta Pávová, photo SEM – Institute of Geology AS CR). Identification of elements and compounds in individual layers was performed by electron microscope analysis (SEM/BRUKER) in the laboratory of the Institute of Geology AS CR. The results are shown in the table below.

Fig. 22. The sample no. 4 – yellow drapery in the background (*Mont Athos*, 1926) identified zinc and lead white, synthetic ultramarine, red and yellow ochre in different proportions in the painting layers. The white undercoat is done by lead white only. One scale field represents 0.01 mm (microphoto: Markéta Pávová, photo SEM – Institute of Geology AS CR). Identification of elements and compounds in individual layers was performed by electron microscope analysis (SEM/BRUKER) in the laboratory of the Institute of Geology AS CR. The results are shown in the table below.

Fig. 23. The sample no. 13 – light on the reeds (*Slavs in Their Original Homeland*, 1912) identified zinc white and synthetic ultramarine in different proportions in the painting layers. The beige underecoat is a mixture of calcium carbonate and zinc white. One scale field represents 0.01 mm (microphoto: Markéta Pávová, photo SEM – Institute of Geology AS CR). Identification of elements and compounds in individual layers was performed by electron microscope analysis (SEM/BRUKER) in the laboratory of the Institute of Geology of the Academy of Sciences. The results are shown in the table below.

Fig. 24. The sample no. 19 – pink strap (*After the Battle of Grunwald*, 1924) identified zinc and lead white, Prussian blue and chrome red in the painting layers. The beige undercoat is a mixture of calcium carbonate, lead and barite white. One scale field is 0.01 mm (microphoto: Markéta Pávová, photo SEM – Institute of Geology AS CR). Identification of elements and compounds in individual layers was performed by electron microscope analysis (SEM/BRUKER) in the laboratory of the Institute of Geology of the Academy of Sciences. The results are shown in the table below.

Fig. 25. Termination of the *Slav Epic* exhibition in the Veletržní Palace in early January 2017.

Translation by Linda Foster