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The Conservation of the Wall Paintings from the Apse of Faras Cathedral (1964–2014)

Faras

In the years 1960–64, during the course of the UNESCO-led Nubian Campaign, the Polish archaeological mission directed by Professor Kazimierz Michałowski explored the areas on the borderline of Egypt and Sudan (in the vicinity of the Second Cataract), which were planned to be flooded by the waters of Lake Nasser. The works in Faras brought the discovery of an architectural complex with a cathedral whose walls were covered with paintings. Both the quantity and quality of the murals qualified it as a unique global wonder. The accompanying inscriptions and captions, in particular the list of bishops, permitted the establishment of the chronology of consecutive stages of the painted decoration of the cathedral. It became a precious comparative reference for the researchers of Eastern painting[1] (**fig. 1**). The transfer of the entire church onto a safe site – a solution implemented in selected cases – proved impossible in Faras in the face of technical and technological problems. A decision was made to detach all the paintings from the walls and divide the collection between the Sudan National Museum in Khartoum and the National Museum in Warsaw.

The decision to transfer the paintings meant that the conservators faced the challenge of creating safe conditions for the paintings during the detachment procedure and transportation. The principles of conservation art were maintained in spite of field conditions. The polychromy was cleansed of dirt and organic residue, structurally reinforced with a weak solution of white shellac in alcohol and safeguarded with Japanese tissue with the use of a mixture based on beeswax with Venetian turpentine and colophony pressed in with a prepared iron. Moreover, layers of gauze were applied, and in the top part – strips of linen were added to adjust cords holding the paintings when they were being cut off from the walls.[2] Some of the murals were divided because of their large size, like for instance the paintings in the apse, where the entire composition was vertically divided into five parts. Their detachment required a partial dismantling of the cathedral walls and an additional safeguarding of concave surfaces (**fig. 2**). In order to perform the task, a layer of plaster was applied on the protected surface of the painting. Next, a construction of wooden slats and oakum filling the curve and protecting the paintings' face was embedded in the plaster.[3]

[1] Kazimierz Michałowski, *Faras. Malowidła ścienne w zbiorach Muzeum Narodowego w Warszawie* (Warsaw, 1974), p. 75.

[2] Ibid., p. 70.

[3] Hanna Jędrzejewska, "Konserwacja malowidła z niszy katedry w Faras," *Rocznik Muzeum Narodowego w Warszawie*, Ann. 14 (1970), p. 433. More on the rescue campaign and conservation of the paintings in an article by Agnieszka Kijowska in the current issue of the *Journal*.

Out of 169 inventoried paintings or their fragments, 120 were successfully detached and 67 of them, after being adequately safeguarded, were packed in cases and transported to Warsaw.

The Paintings from the Apse

The cathedral's beginnings date back to the 8th century, which is also the dating of its earliest paintings. The most important place in the church was the chancel's apse, where the very first depictions in the cathedral were applied, presumably for ritual reasons. They also happened to be the most frequently repainted and renewed ones.[4] The paintings were applied onto a ground of lime mortar, on a layer of whitewash. Numerous repainted areas implied that there were often two or even three painted layers upon different whitewash layers (**fig. 3**).[5]

Originally, the composition depicted Virgin Mary accompanied by the Twelve Apostles symmetrically standing on either side of Her. The top part of the paintings with the heads of the figures had regrettably been destroyed. However, the apostles' white robes have been preserved intact, even if they carry traces of repainting from the period of the first paintings on the walls in the aisles.[6] Their tunics and coats are decorated with yellow and red vertical stripes (Gr. *potamoi*) with the characteristic letters eta (H) and gamma (Γ) with which Late Antique painters adorned the apostles' robes.[7] In the early 10th century, the depiction of Virgin Mary was thoroughly repainted – as changed from Mary Enthroned to erect Mary with Christ the Child – with the figure of a king added, upon whose shoulders Mary leans Her hand in the gesture of protection. Around AD 1000, a figure of a bishop wearing liturgical vestments was added on the right verge of the composition and the figure of the ultimate apostle depicted next to him was renovated. Not earlier than in the 12th century, two figures were added on the two sides of the Virgin Mary – a figure of an official in a long robe decorated with medallions, the costume overlapping the bottom birds-in-arcades frieze[8] and a second depiction, hardly legible, which has been preserved in an extremely poor state (**fig. 4**).[9]

[4] Stefan Jakobielski, "Malowidła z Faras. Pół wieku po odkryciu," in *Sztuka Afryki w kolekcjach i badaniach polskich*, Sławomir Szafrański et al., academic eds (Szczecin, 2014), pp. 253–80. Biblioteka Naukowa Muzeum Narodowego w Szczecinie, Seria Etnologiczna.

[5] The first tests of the stratigraphy of plaster layers were performed in the 1960s in the lab directed by Dr Hanna Jędrzejewska, as a trace has been preserved in descriptions and drawings found in conservatorial diaries. Another series of tests were run in 2013 within the research grant of the National Science Centre (NCN) "Technologia malarstwa nubijskiego: historia, rodzaje, konserwacja" [The Technology of Nubian Painting: History, Types, Conservation] (NCN nr 0111/01/D/HS3/06119).

[6] Bożena Mierzejewska, "Virgin Mary with Child and Apostles, Nubian Rulers and a Bishop (Composition in the Apse)," in *The Professor Kazimierz Michałowski Faras Gallery. The Guidebook* (Warsaw, 2014), pp. 188–97.

[7] Krzysztof Babraj, "La symbolique des lettres Γ et H dans l'apside de la cathédrale de Faras et leurs liens avec l'art copte," *Nubian Lettres*, no. 4 (1985), pp. 15–19.

[8] Previously, the birds in the frieze were described as doves, while Bożena Iwaszkiewicz-Wronikowska believes these are eagles. See Bożena Iwaszkiewicz-Wronikowska, "La frise de l'abside de la première Cathédrale de Faras," *Orientalia Christiana Periodica*, Ann. 40, no. 2 (1974), pp. 377–406.

[9] I am indebted to Professor Stefan Jakobielski for His assistance with archaeological questions.

The Conservation Treatment and Tests Carried Out over the Apse Paintings in the 1960s

The paintings from the apse landed in the National Museum in Warsaw in June 1964. The conservation works were carried out at the NMW's Gallery of Ancient Art, directed in the years 1964–69 by Dr Hanna Jędrzejewska,[10] the author of an elaborate research-and-conservation programme for the Faras paintings. In the years 1970–74, Józef Gazy was in charge.[11]

Before the conservation treatment, the paintings were documented. Basing on the evidence provided by archaeologists (plans of the cathedral complete with the drawings of the apse), detailed 1 : 1 drawings were made on cardboard and tracing paper. The next stage was the actual treatment of the objects, starting with the reverse sides. The surface was cleansed of dust before the plaster began to be thinned through the wetting of its surface with alcohol. The lime plaster – very compact and grainy, with a great number of little white stones, tending to stratify towards the whitewash layer – proved hard to remove. Part of the plaster was successfully thinned, while it was not removed entirely; the material scratched was collected and the sand was washed of salt and sieved. It was later used to produce putty to fill gaps in the ground. The next step was the desalination of the structure of the paintings. The entire surface of the reverses was sprinkled with distilled water and drained off with compresses of cellulose wadding. The procedure was repeated numerous times until all salt had been extracted. The structure of the remaining plaster was reinforced with polyvinyl acetate (PVA) in methanol. Later on, it turned out that the method was inefficient since the clay contained in the original plaster retained PVA, forming a film on the surface and allowing only alcohol to penetrate the plaster. Devoid of a structural reinforcement, the plaster did not provide a stable ground for the painting layer and later caused the polychromy to stratify and crumble.[12]

In the course of the conservation works, remains of an older painted layer showed in two central paintings of the apse. A decision was made to save it, to separate the preserved fragments and transfer them onto a new ground. A "cradle" was prepared whose shape was a negative of the painting's shape. It was lined with muslin gauze in order to prevent the pieces from sliding from the curved surface. Japanese tissue was glued with gum arabic to the entire surface of the plaster of the older fragments. The plaster was then separated from the later layers by means of the strappo technique.[13] The detached fragments were arranged on a solid ground, the layer of paint facing upwards. The crumbled pieces were then fitted in and adjusted with drops of gum arabic or a solution of PVA dispersed in water, while the surface was wetted beforehand with a 5% solution of para-chloro-meta-cresol (PCMC) in alcohol. Minor loosened pieces of the painted layer were glued back with a 2% solution of PVA in alcohol. Fragments deformed as a result of gum arabic (used with the Japanese tissue) that pulled the surface too tightly were subjected to arduous treatment aimed at restoring the original curvature. Pieces

[10] Lecturer at the Chemistry Department of the University of Warsaw and later at the Academy of Fine Arts in Warsaw; she organized the Research Laboratory for the Collection of Ancient and Early Christian Art of the NMW.

[11] The conservator from the National Museum in Warsaw who was employed in the Nubian campaign, and participated in the detachment of the wall paintings in Sudan and in the conservation treatment of a portion of objects which made their way to the Sudan National Museum in Khartoum.

[12] Information concerning work on the paintings provided by Jerzy Kozłowski, the conservator from the NMW who participated in the conservation treatment of the Faras paintings.

[13] A method consisting in detaching and transferring only the layer of paint.

of the painting were placed on a cloth and transferred onto a specially prepared cradle lined with muslin gauze soaked with distilled water to make the layers of gum arabic more flexible. On the face-side of the painting, the pieces were covered with Japanese tissue and perforated foil, and then weighed down with sandbags. The process being complete, the humid muslin gauze was removed and the pieces were left under pressure until they dried up. Next, they were reinforced as the cracks on the painted side were covered with strips of Japanese tissue glued with beeswax and colophony.[14] Then they were inversed face to bottom and coated with PVA in alcohol with an admixture of chalk, while holes in the plaster were filled with putty.[15] The layers were then transferred onto a new ground.

In all five parts of the composition from the apse, gaps on the reverse sides – which pierced successive structural layers and sometimes even reached the Japanese tissue applied on the face – were filled. Used here were the PVA-based putty with the filling of both original sand and newly purchased Opoczno sand. Next, the entire surface was coated with a solution of PVA in alcohol and covered with a layer of plaster based on PVA solution in alcohol and glass cloth was glued into it. Next, cases wrapped in glass cloth fastened with polyester resin Polimal 109 were embedded. The entire construction was covered with a panel of perforated MDF. The paintings lay on the new construction face up.

The last stage of conservatorial works were focused on the painted surface. Firstly, colophony and beeswax which had safeguarded the paint were removed. In order to soften this layer, cotton wool compresses soaked in petrol were used. After the facing was removed and the surface was cleansed, gaps on the reverse side were filled with putty. Next, all parts of the apse composition were joined together along the edges by means of wooden blocks.[16] During the conservation treatment, specimens were taken for examination and observations were made under a stereo microscope for a preliminary characteristic of individual layers. The spots for specimens were marked on real-size copies of the paintings previously prepared on tracing paper. A detailed documentation was carefully drawn up based on photography, drawings and descriptions.

The Conservation Treatment and Examination of the Apse Paintings in the Years 2013–14

The fundamental rearrangement of the NMW's Faras Gallery which involved the removal of the paintings from the display provided the opportunity to thoroughly examine and check their state of preservation. In order to avoid problematic transportation, the objects were placed in the rooms of the Gallery of Ancient Art which was being prepared for refurbishing works. Gathering all objects in one room also greatly favoured the coordination of both conservatorial works and examination.

The general state of preservation of the Faras paintings was good. Minor mechanical damage was observed near the edges of the background after the installation in frames, in

[14] According to the conservatorial report *Apsyda*, no. 1 (4–5) of 1967.

[15] A series of tests were run and putties of various composition and compound proportions were prepared. In the given case, the putty was used whose composition was: 4 parts of desalinated original sand from the apse, 1 part of Opoczno sand, 0.5 part of chalk, 9 teaspoons of titanium white, 1 teaspoon of ochre. The conservatorial report *Apsyda*, no. 1 (4–5) (1967), p. 41.

[16] As related by J. Kozłowski.

the bottom part in particular. In the frieze with birds, as well as near the right edge of the wall within the repainted areas (the figures of a bishop and an apostle), the painted layer was partially very fragile, tending to loosen and stratify (**fig. 5**). The surface was dirty and intensively overglossed as a result of being glued with crystalline PVA to protect the fragile painted layer. The surface of the reconstructed background was covered with dust. The paintings were observed not only in daylight, but also in UV light (**figs 6a–b**).[17] An evident difference in the reaction of various parts of the painting to radiation and shininess of the historical repainted areas of the top layers were observed, permitting easier observation of the outline of the robes that are much less visible in daylight.

After photographic documentation was complete, the actual conservatorial stage began. The five parts of the composition were laid on the floor, next to each other, the layer of paint facing the top. Wooden platforms were assembled and installed above the screens, forming a construction which gave access to the central parts of the depiction to conservators. Excess PVA forming a glossy layer on the surface was removed with the use of acetone and ethanol. At the same time, the polychromy was cleansed of the remaining mass of facing and dirt.

In the frieze with birds in arcades, apart from the glossy effect, the surface had also turned whitish, most probably caused by the remaining protective layer of shellac, which proved very hard to eliminate. The work was even more complicated by the fact that the paintings consisted of several layers. The worn layers of whitewash and polychromy permeated each other. Additionally, in some part of the apse the whitewash which provided background for the top layer of the paintings became transparent the moment it was being treated with solvents, revealing bottom painted layers, which rendered the painting even more illegible and blurred.

Cleansing procedures rendered several details more pronounced, like the pendants in the bottom part of the ruler's robe from the central part of the painting (**fig. 7a**), remains of vermilion robes in the centre of the composition or the outline of the robe with medallions worn by the figure to the right side of the Virgin Mary. The cleansing permitted the excavation of fragments of the dark claret-coloured robe of the Virgin Mary which may have belonged to the earliest depiction in this spot from under a layer of dirt (**figs 7b–c**).

It proved necessary to reinforce the stratifying fragments of polychromy with glue in the repainted area and around the frieze with birds. The procedures were carried out parallelly with cleansing, with the use of a 5% solution of crystalline PVA in ethanol (**fig. 8**). Next, dirt was mechanically removed from the reconstructed background by means of erasers and tiny gaps in the ground were filled. The priming used was the one employed in the previous conservation treatment and acquired from the side wall of the painting. Moreover, PVA in water dispersion was added for the sake of reinforcement.

Research Programs

Simultaneously with the conservation treatment, a research programme was conducted aimed at acquiring information on the stability of materials employed in the previous conservation treatment and the current state of preservation of the paintings as well as the original materials and techniques. In order to employ cutting-edge investigation methods, the Chemistry

[17] Photographs in UV light made within the framework of the aforemetioned research grant of the NCN (National Science Centre).

Department of the Technical University in Warsaw, the Chemistry Department of the University of Warsaw and the Jerzy Haber Institute of Catalysis and Surface Chemistry at the Polish Academy of Sciences in Krakow were contacted. Examined were both paintings and their fragments from the NMW's storeroom which had not been subject to conservation treatment before.

The first portion of tests was performed in order to acquire data on the original pigments used. Non-destructive and non-invasive methods were employed: the portable X-Ray Fluorescence (p-XRF) Spectometry and the Raman spectroscopy. The complementary methods facilitated the gaining of information on the precise chemical composition of pigments and their unequivocal identification. Among pigments containing iron compounds, ochre and umber were identified in the red and brown parts of the robe in the repainted areas of the robe folds. Kaolin proved to be present in the grey background applied onto the original depiction upon which the figure of an official was painted to the right of the Virgin Mary, and particles of Egyptian blue were found in one of the specimens.[18] The stratigraphic examination of specimens from fragments which had not been restored before confirmed the multi-layer structure of the paintings and the presence of thicker grains in the ground which proved so difficult to remove during the first conservation work of the complete paintings. The detailed analyses, complete with outcomes, will be published as part of the documentation and discussion prepared in the framework of a research grant.[19]

The next tests were targeted at determining the state of preservation of materials used in conservation. The crystalline PVA was analysed which served as impregnation for the original layers as well as the PVA in the form of water emulsion from the artificial background of the paintings. At the same time, model specimens of contemporary PVA were created for a comparative study. Spectroscopic techniques were employed to analyse the binders: the IR (infrared) spectroscopy and the Raman spectroscopy. The spectra of specimens from the reconstructed layers containing binders were compared with the reference specimens. No essential differences in spectral width – whose changes can imply transformation of materials – were observed, which means that the binders in non-organic material did not surrender to degradation.

Moreover, the polyester resin Polimal was examined which had been used to reinforce the construction elements of the framework and the glass fibre cloth. Optical microscopic examination did not reveal any differences in the material's continuity, and the outcomes acquired from various parts of the specimen were identical, which may prove that no changes have occurred. The use of Raman spectroscopy confirmed the outcome from the infrared analysis. On the basis of these results, a conclusion can be drawn that examined binders have not degraded. Unfortunately, one cannot unequivocally foretell the progress of this process (if any occurs), as it is also difficult to predetermine the lifespan of materials used.[20]

[18] Specimens no. 22 and 23, fragment of the apse no. 1–2; see the conservation documentation stored in the archive of the Conservation Workshop of Ancient Art and Stone Sculpture of the NMW (*Fragment absydy nr 1–2, L.521* [Fragment of the apse no. 1–2, L. 521]).

[19] Research team: Olga Syta and Dr Hab. Barbara Wagner from the Chemistry Department of the University of Warsaw. The tests were run within the aforementioned research grant of the NCN. I would like to express my gratitude to Dr Dobrochna Zielińska for the consultation and opportunity to use the research material produced in the grant.

[20] The tests and the analysis of the outcomes were performed by Dr Zofia Żukowska from the Chemistry Department of the Warsaw University of Technology.

The next stage of the examination was the analysis of the state of preservation of selected fragments of the paintings. The highly sensitive non-invasive optical methods were implemented: thermography and Digital Speckle Pattern Interferometry (DSPI). Optimal examination conditions were created (**fig. 9**). Objects were placed on custom-made boards which limited vibrations transferred through the ground, or directly on the floor, so that the reception of signals was not interfered. The bottom part of the paintings was the main focus since the increase of the height of the base of the interferometer significantly lessens its stability and decreases the quality of acquired images. The accessibility of examined areas for tests of control after the objects are installed in the new gallery was also taken into consideration.

The surface of the painting from the area of the last rosette to the right of the apse and the arcade from the frieze with birds was examined (**fig. 10**). The analysis performed with use of the DSPI method indicated the loosening of numerous minor surface spots. The spots with a diameter up to 1.5 cm were recorded at a relatively low amplitude of sound which means that they are located almost directly underneath the surface.[21] The analysed fragment of the surface of the painting possesses typical damage also observed in other fragments of the bottom part of the wall painting and can be treated as a reference area for future comparative measurements.[22]

The tests discussed above are planned to be resumed every three years. It will allow for the continuous supervision of the state of preservation of the objects and provide the possibility of preventive action in case changes should occur. Acquired results complete the description of the state of preservation and will be helpful whenever decisions will need to be made concerning the conditions of storage, conservation or the loan of the wall paintings.

I would like to express my gratitude to Mrs Barbara Lewandowska and Mr Jerzy Kozłowski, the conservators from the Ancient Art Conservation Workshop of the NMW, for their comprehensive assistance with the subject of the conservation treatment conducted in the 1960s and 1970s.

Translated by Karolina Koriat

[21] Acquired results confirm the problems (observed during conservation treatment) with the fragile and stratifying painted layer in this part of the paintings. During the conservation treatment, the spots were glued with a solution of crystalline PVA in ethanol.

[22] Michał Łukomski, Leszek Krzemień, *Badania stanu zachowania fragmentu malowideł pochodzących z Faras* (see the internal report of 2013 stored at the Conservation Workshop of Ancient Art and Stone Sculpture), pp. 6–9.