BRVKENTHAL. ACTA MVSEI

XIX. 4

MINISTERUL CULTURII

MUZEUL NAŢIONAL BRUKENTHAL

BRVKENTHAL

ACTA MVSEI

XIX. 4

Sibiu / Hermannstadt, 2024

ISSN: 2285-9470 **ISSN-L: 1842-2691**

Muzeul Naţional Brukenthal

Editura Muzeului Naţional Brukenthal

Începând cu anul 2009, revista a fost indexată în baze de date internaţionale astfel:
2009 - INDEX COPERNICUS http://www.journals.indexcopernicus.com/karta.php?action=masterlist&id=4759
2010 - EBSCOHOST http://www.ebscohost.com/titleLists/tnh-coverage.htm
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2015 – ERIH PLUS: https://dbh.nsd.uib.no/publiseringskanaler/erihplus/periodical/info?id=484924
Începând din anul 2011, publicaţia este vizibilă şi pe platforma editorială **SCIPIO** (http://www.scipio.ro/web/brukenthal.acta-musei).

Starting with 2009, the publication is indexed in the following international date-bases:
2009 - INDEX COPERNICUS:http://www.journals.indexcopernicus.com/karta.php?action=masterlist&id=4759
2010 - EBSCOHOST:http://www.ebscohost.com/titleLists/tnh-coverage.htm
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2015 – ERIH PLUS: https://dbh.nsd.uib.no/publiseringskanaler/erihplus/periodical/info?id=484924
Starting with 2011, the publication is to be found on **SCIPIO** editorial platform (http://www.scipio.ro/web/brukenthal.acta-musei).

Orice corespondenţă referitoare la această publicaţie rugăm a se adresa la:
Muzeul Naţional Brukenthal - Muzeul de Istorie Casa Altemberger, Str. Mitropoliei, nr. 2, Sibiu, 550179. **Tel:** 004/0269/218143, **Fax:** 004/ 0269/ 211545. E-mail: iulia_m_pascu@yahoo.co.uk; Website: www.brukenthalmuseum.ro
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TABLE OF CONTENTS

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THE RESTORATION PROCESS OF THE ICONOSTASIS DOORS OF "ST. HIERARCH NICHOLAS" CHURCH FROM RIBIȚA, HUNEDOARA COUNTY

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***Abstract**: The present work brings to the experienced readers in the field of restoration and to those who are in the process of training a description of the research stages and putting into practice the knowledge acquired during my years of university study on the first large-scale site I have ever participated in.*

The rigorousness of the project and of the technical verifiers imposed from the start the drafting of qualitative materials, the correct and step-by-step documentation of the restoration interventions, the clarification of some technical processes of realization and of the occurrence of chemical and biological degradation phenomena. The most significant challenge was undoubtedly the great efforts we made in consolidating the diaconate doors so that they could be used in the liturgical act and captured in their original state by the elevated visitors. Removing them from the church and placing them in an exhibition would have meant removing these pieces from their liturgical and historical context. Naturally as you will well realize from the introduction, these four pieces are a nineteenth-century work, nowhere near approaching the much earlier origins of the frescoes or the construction. However, they do represent a historic milestone, as they have been standing on this site for more than 150 years, and saving and enhancing them has been a particular priority.

From the descriptive material written for the project I have selected a small part and exposed in the following lines to share the experience and understanding of the executed restoration. Last but not least, I exhibited a numerous explicit illustrative material, alongside tables of various wet tests performed on supports as a means of inspiration in the work of other restorers.

***Rezumat**: Lucrarea de față aduce în fața cititorilor experimentați în domeniul restaurării și a celor ce sunt în curs de formare o descriere a etapelor de cercetare și punere în practică a cunoștințelor dobândite în urma anilor de studiu universitar pe primul șantier de proporții la care am participat.*

Rigurozitatea proiectului și a verificatorilor tehnici au impus din start redactarea unor materiale calitative, documentarea corectă și etapizată a intervențiilor de restaurare, lămurirea unor procese tehnice de realizare și de asemenea a apariției unor fenomene de degradare chimice și biologice. Provocarea cea mai însemnată a fost fără incertitudine eforturile mari pe care le-am derulat în consolidarea ușilor diaconești pentru a putea fi utilizate în actul liturgic și surprinse în starea originală de vizitatorii elevați. Înlăturarea lor din lăcaș și amplasarea într-o expoziție ar fi însemnat scoaterea acestor piese din contextul liturgic și istoric. Firește că după cum bine vă veți da seama încă din

introducere, aceste patru piese sunt o producție de secol XIX, nici pe departe să se apropie de originile mult mai vechi ale frescelor sau a construcției. Cu toate acestea ele reprezintă o etapă istorică, întrucât își au veacul în acest loc de mai bine de 150 ani, iar salvarea și valorificarea lor a fost o prioritate deosebită. Din materialul descriptiv redactat pentru proiect am selectat o mică parte și expus în rândurile următoare pentru a împărtăși experiența și înțelegerea restaurării executate. Nu în ultimul rând, am expus un bogat material ilustrativ explicit, alături de tabele ale diferitelor teste umede executate pe suporturi ca mijloc de inspirație în munca altor restauratori.

Keywords *Ecclesiastical heritage, restoration project, pigment analyses, ecclesiastical sculpture, ironwork.*

Cuvinte-cheie*: Patrimoniu eclesiastic, proiect de restaurare, analize ale pigmenților, sculptura eclesiastică, feronerii.*

Recent history.

The walled church located in the village of Ribița dates back to the 14th century. The earliest mural painting dates in the 15th century, but in the course of time new mural decorations were added over the original ones[1].

This article aims to describe the restoration process of the diaconate and imperial doors fixed in the anchorings of the iconostasis openings. From the cumulative analysis of the wood species[2] and the materials of the painting layers [3] we concluded that the doors could be part of a 19th century decoration. The oldest preserved elements are the carved linden wood panels of the diaconate doors. Two later stages are the replacement of the carved panels of the imperial doors with new ones made of oak, and the addition of painted canvases (applied with glue on the plywood) in the door frames. As can be seen in the pictures before the restoration, the doors have also undergone some repair interventions such as: doubling with plywood on the back, adding some fir wood stiffeners, introducing some metal fasteners which have significantly contributed to the weakening of the linden wood panels together with the xylophagous attack of the *Annobium punctatum*. The intensity of the attack was measured by counting the holes on the outside (10/10 centimeters), and the observation of the gallery was made with the help of radiology[4]. The damage caused by this *Annobium* was so extensive that the decision to replace the doubling system with plywood and to reinforce the structure by impregnation was due to it. Its presence is frequently reported in such monuments in older studies [5]as well as in the

[1] Porumb Marius*, Pictura murală din Transilvania. Secolele XIII – XVIII., Dicționar*, Editura Academiei Române, Editura Mega, București, (Cluj-Napoca, 2023), 545.
[2] Bucșa Livia, Buda Andrei, *Buletin de analize* Nr. 26/2021.
[3] Niculescu George, *Buletin de analize XRF*, Iconostas Ribița, R5365 – R5370, 1 - 6
[4] Bălan Alexandra, Bucur Mirel Vasile, *Restoration Interventions for Wooden Icon "Madonna with Child" attributed to Gheorghe, the son of Iacov (1774)*, in "Brukenthal Acta Musei", (Sibiu, 2020), 817 - 818.
[5] Bucșa Livia, Bucșa Cornel, *Agenți de biodegradare la monumentele istorice din România. Prelevare și combatere*, Editura Alma Mater,(Sibiu, 2005).

one of recent date[6]. In order to prevent the active attack from spreading in the laboratory, it was necessary to quarantine the pieces and biocide the supports deep inside the structures.

From our research of church documents and the archives of the Diocese, we have not been able to reveal when these doors were added as decoration to the iconostasis of the wall. Also, the identity of the sculptors of those two distinct stages and the identity of the painter are still in the process of research.

We note that this church was under study between 2015 and 2020 and the restoration project was possible due to the company CREDO DESIGN SRL coordinated by the architect and engineer Aurora Târșoagă. The restoration company EURAS SRL and its partners fulfilled the project between 2021 and 2023. Thanks to this project we were able to actively participate in the restoration of ten movable pieces from the church heritage. We present below four of them, focusing on the treatment of advanced degradation of the linden wood elements, mainly caused by the combined attack of anobides and fungi through excessive humidity.

Short technical description.

The imperial and diaconate doors are made of a range of organic and inorganic materials. The inorganic materials used are: the gesso aggregate, the bolus, the pigments, the metal leaf (gold, silver and schlagmetal) and the metallic elements; while the organic materials used are: the wood (linden, spruce, oak), the canvas, the binders, the glues and the varnish.

The wooden doors are carved and pierced, and the front part is painted and polished. The painting is done in tempera on wood with reinforcing cloth between the layers of the gesso. The pigments are of various origins (earth pigments, oxides, salts, synthetics) and are inorganic in nature. The polishing is carried out in the traditional way: glue and several layers of gesso are applied to the wooden support, then the bolus is applied on top of this, followed by gold or silver leaf (depending on the area) as the outside is varnished with a natural varnish.

There are two *imperial doors* with general dimensions: 189/47.5/6 cm (right door) and 175/47.5/5 cm (left door). The painted paneling, carving, fretwork and joining of the transoms are similar. The only difference is noticed on the right door. It has a full-height doorpost with the symbol of the cross appearing at the top. The element positioned in the closing area of the two doors serves as a doorstop. The door panels are made of hardwood - oak[7]. The planks that make up the panel are glued together at the edges and have two transoms of the same wood on the reverse. They are arranged horizontally, perpendicular to the direction of the grain of the panel, are half-embedded and dove-tailed. The fretwork and carved ornaments represent plant motifs (vines, leaves, flowers), geometric motifs in the lower part and Christian-influenced motifs in the upper part (the cross). They are all framed by an undecorated outer border.

Polishing is carried out with schlagmetal leaf on the carved area and with a silver leaf on the side edges. A layer of glue is applied to the wooden support, then the medium-thickness gesso, well sanded. Between the gesso and the metal foil there is a thin layer of bolus, easily visible in worn areas and stratigraphy. The varnish has been applied over the metal sheet.

[6] Axinte Loredana, *Aspecte privind conservarea unor biserici de lemn din județul Suceava împotriva atacului insectelor xilofage dăunătoare*, Editura Karl A. Romstorfer, (Suceava, 2016).
[7] Bucșa Livia, Buda Andrei, *Buletin de analize* Nr. 26/2021, 2-3

The *Annunciation* scene is depicted centrally on each door, in small panels. On the left door is the Archangel Gabriel and on the right door the Virgin Mary. The predominant colors used to depict the iconographic scenes are: blue - for the background and vestments, brown - for the background, red - for the vestments, white - for the vestments and clouds, and a mixture of colors - for the figures.

The diaconate doors are two in number and have general dimensions: 169/41.5/4 cm (right door) and 165/43.5/4 cm (left door). The painted paneling, carving, fretwork and the joining of the transoms are similar for both the diaconate and imperial doors. The door panels are made of hardwood - linden[8]. The planks that make up the panel are joined together with glue in the corner and supplemented on the back with two crosspieces of spruce wood[9], laid horizontally (perpendicular to the direction of the fiber of the panel), half recessed and joined into the panel in a dovetail. The fretwork and carved ornaments representing plant motifs (vines, leaves, flowers) are present throughout the panel. They are framed by an undecorated outer border.

The veneer is done with gold leaf on the carved area and side borders. A coat of glue is applied to the wooden support, then the medium-thickness gesso which is well sanded. Between the primer and the metal leaf there is a thin layer of bolus, easily visible in worn areas and stratigraphy. The varnish is applied over the metal sheet.

The brush strokes are applied quite consistently. The imperial doors have the iconographic scene of the *Annunciation* (on the left door the Archangel Gabriel and on the right door the Virgin Mary and the Holy Spirit). The diaconate doors depict the Archangels (Archangel Gabriel on the left door and Archangel Michael on the right door). The biblical figures are depicted standing and their names are written above their heads.

State of conservation.

The imperial doors are in a good state of conservation, but they have been subjected to later interventions that affect both the value and the aesthetics of the piece. The wooden panel is in a good condition, with no significant loss of material or embrittlement due to the biological attack. There are metal nails piercing the panel on the reverse. There are small bumps or scratches in the side corners as a result of neglect. On the underside, on both the front and the reverse, a 27 cm long plank is visible with a 27 cm long plank notch. In the lower corner there is functional wear (due to liturgical use). Adhesive and anchored deposits are also visible on the lower part of the panel. The cross at the upper end of the doorstop is painted with bronze that was added at a later stage. The entire surface is covered with non-adherent or poorly adherent deposits.

The polish is covered by a thin layer of liquid bronze which was added later. It has an uneven and degraded appearance, representing a hydrophobic barrier to moisture that could favor the growth of microorganisms. Under recoating the original metal sheeting is slightly degraded, showing local wear, cracking to the bolus or to the gesso and various deposits. In the lower part where the panel has had contact with the ground, a rising damp has favored loss of the color layer, exfoliation or powdering, which is visible in the radiant light under repainting.

The diaconal doors are in a poor state of preservation as a result of intense biological attack. The most significant problems of the panel are the losses of the wooden material. The attack of xylophagous insects has favored the dislocation of some elements, especially from the lower part and deformations, cracks or fissures in the panel in the hinge area. In areas where the attack is intense, the

[8] Bucșa Livia, Buda Andrei, *Buletin de analize* Nr. 26/2021, 1
[9] Bucșa Livia, Buda Andrei, *Buletin de analize* Nr. 26/2021, 1-2

appearance of the wood is spongy, lacking the mechanical strength necessary to support it. Consequently, the door panels have been additionally reinforced with mechanically pinned fasteners with metal nails. The door in the worst state of preservation of the four is the diaconate door on the left. Metal nails inserted to strengthen the panel have created longitudinal cracks or fissures. The dorsal side shows both xylophagous insect flight holes and longitudinal cracks. The panel planks have become unglued at the bottom and the flatness of the two has changed, being displaced in different planes. The joints of the crossbeams in the panels have loosened and they are only partially fixed in metal nails. Adhering or non-adhering deposits (dust, cobwebs, plant debris, dead insect exoskeletons, xylophagous insect sawdust) are observed on the surface of the exposed wood, while the parts exposed to light have oxidized, the appearance of the wood is darker (brown).

The veneer does not show any repainting as in the case of the imperial doors, the gold leaf being apparent. On the underside of the doors where they have had contact with the ground, the polish and preparation have exfoliated down to the wood. In these gap areas, massive parts of anchored and adherent deposits are present on the left doorway, and on the right doorway there is a gold-orange repainting that mimics the bolus. Above the doorknob, there is an area of greasy (hand) deposits in which dust that has anchored is visible on both doors. The sheet metal is slightly eroded at the surface. Locally there are areas of scale-like flaking. There are multiple cracks in the preparation and frosting along the length of the panel. Adherent and non-adherent deposits (dust, cobwebs, xylophagous insect sawdust) appear on the varnish.

The canvas of the painting is unglued at the bottom. The canvas and the painting in the middle area are penetrated by a metal nail that was inserted from the reverse side of the panel. There are adherent deposits, cobwebs and dust on the surface of the painting.

Inadequate interventions.

Subsequent interventions are found on the reverse of the four doors - where the wooden backing has been doubled with plywood (between the transoms, above and below them). This is applied to the reverse side with animal glue and supplemented with metal nails penetrating the door panels. The plywood was necessary for the diaconate doors, which required this type of intervention, but not for the imperial doors, which are made of oak and not decayed. On top of part of this plywood the gesso is applied, reinforced between layers by a cloth. The original pigments are visible over the preparation layer. This painting is visible from the front side, centered in the fretwork. The hinges of the doors are made of industrially produced metal. They are fixed to the side of the door and to the altar walls with wood screws. The diaconate doors have bronze locks on the front and the back sides. The imperial doors have a single latch (fixed to one of the doors) which slides into a metal tongue (fixed to the other door) and locks them.

The plywood of the imperial doors is in a relatively good state of preservation, but is actively attacked by xylophagous insects. The plywood of the diaconate doors is degraded and made up of many pieces placed carelessly. In some areas, the glue has lost its adhesive properties and the plywood has detached. In other areas the nails have been ejected or where the panel has ground away, the nails no longer exert a firm mechanical hold.

The painting is in a good state of conservation. The canvas is slightly detached at the bottom, and the color layer has minor losses and small areas of flaking color scales. Anchored and non-stick deposits appear on the surface of the polychrome. In the case of the metal-leaf polychrome, repainting

interventions occur - something frequently noticed on heritage pieces in the inventory of churches[10] coming as a sanitizing or maintenance action started by the parishioners. Unfortunately, these materials are difficult to remove, and the solvents that work are toxic[11].

Metal elements have been deformed by mechanical work. In some areas the surfaces show oxides (rust) resulting from microclimate fluctuations. There are also fatty deposits on doorknobs and latches.

Restoration process.

Paneling and door painting

Prior to the restoration process, we photo-documented the pieces *in situ*, followed by the application of Japanese shellac on the surface to secure the peeling paint that could occur during transportation to the restoration lab. Since at the time of studying these pieces, we found that the xylophagous insect attack was active, a two-week quarantining period was required during which Per-xil[12] was injected into the interior of the linden wood panels in order to eliminate the decay before beginning the restoration process of the doors. The next stage involved dismantling stiffening elements such as battens, planks and pieces of plywood so that the pieces could be assembled correctly and to gain access to their reverse sides. Mechanical cleaning involved the removal of dust, soil deposits, salts migrated from the neighboring materials, and sawdust by brushing and vacuuming. More adherent deposits such as smoke were removed with alcoholized water[13]. After soaking the surface with a swab moistened in the mixture, the deposits were removed with a second, less moistened swab[14].

Because significant parts of the diaconate doors were embrittled we introduced as structural reinforcing agent - Paraloid B72[15] with a 20% concentration dissolved in ethyl acetate. The excess of the substance on the surfaces resulting from the injection into the structure was removed using acetone-soaked swabs so that the glues added in the following stages would have better adhesion to the surface.[16] The plywood added on the back of the diaconate doors, even if we consider it to be a later stage, had to be removed and replaced with a new one so that the fragmented parts would have a stable support. As the plywood is a new element, we were able to make a fretwork like the carved panel to emphasize the decoration. The fastening of the plywood teak elements was realized with animal glue[17]. In order to achieve a very good contact between the pieces, we used hand clamps to exert the necessary force. After mounting all the carved fragments on the new support, we filled in the wood losses with the same wood of the same hardness, respecting the direction of the fiber, and at the contact between the original and the filling, we inserted a 3-millimeter-thick strip of balsa wood to support any deformation of the new material. The gluing of the additions was also done with 30% bone and skin glue. As the appearance of

[10] Postolache Dana Luminița, *Restaurarea unui iconostas brâncovenesc,* in ”Caietele Restaurării 2014”, Editura ACS, (București, 2014), 109 – 111.
[11] Erminio Signorini, *Surface Cleaning of Paintings and Polychrome Objects in Italy: The Last 15 Years,* în *New Insights into the Cleaning of Paintings,* in ”Smithsonian Contributions to Museum Conservation”, (New York, 2010), 18 - 20
[12] Biocide product provided by CTS ROMANIA SRL.
[13] According to table no. 1 in the Annexes.
[14] Langa Paul Victor, *Restoration Of The Icon „Sorrowful Mother Of God” Painted By The Tămaş Family From The Făgăraş County,* in ”Brukenthal Acta Musei”, (Sibiu, 2023), 691.
[15] Structural reinforcement product provided by CTS ROMANIA SRL.
[16] Langa Paul Victor, *Restoration Of The Icon „Sorrowful Mother Of God” Painted By The Tămaş Family From The Făgăraş County*, in ”Brukenthal Acta Musei”, (Sibiu, 2023), 691.
[17] Bone glue 60% mixed with leather glue 40% - dissolved in water. The concentration obtained in the liquid was 25%.

the completions was quite optically disturbing, we applied two coats of water-based wood stain to obtain a more closely resemble of the degraded wood in the immediate vicinity.

Painted canvas

As the painted canvases inside the door frames were applied on the degraded plywood, we opted in the case of the diaconate doors to extract them and apply them on the new plywood, using a 7% concentration of leather glue in an aqueous medium.

Metallic elements

The metallic elements were treated separately. They were pickled, degreased with organic solvents and cleaned in a 20% orthophosphoric acid bath[18] using metal brushes. Protective coating was carried out by phosphating and adding a layer of boiled linseed oil. The pieces were mounted back onto the doors and into the masonry, respectively, at the end of the restoration using the same fasteners. Because of their very different appearance, we believe that these metal elements were taken from other pieces and used in the iconostasis doors. The handles and latches may well have belonged to some of the windows.

Door panels and painting

In order to ensure the strength of the gluing made on the wooden surfaces, we inserted wooden dowels in some of the supports, which pierce transversely or obliquely through the planks. The painting layer was reinforced with 5% fish glue. This was introduced by brushing under the loose paint flakes or by injection[19]. After tempering the surface, we pressed the detached paint flakes with a thermostatic spatula[20]. After this stage, we removed the Japanese sheet in order to start the stripping and cleaning stages. The removal of massive grease and wax deposits was carried out with white spirit and ethyl alcohol[21]. After stripping the subsequently added liquid bronze, cleaning of the aged varnish and its deposits was necessary to more accurately capture the original materials of the pieces. We used ethyl alcohol-based mixtures[22] to clean the adherent deposits. The best results were obtained with ethyl alcohol-based mixtures in combination with ammonium hydroxide with a 2% concentration.

Aesthetic interventions

In order to present the doors visually accessible to the general public, we decided to color-integrate the highly degraded areas and new grouting using water-based watercolors. Depending on the surface and the regime imposed by the piece, we intervened with *rittoco* or *mimetic* style integrations. For the protection of the painted surface, I added a varnish made from dammar at the end, and after 8 days of drying I added a second coat of *Regal* varnish[23] to slow down the degradation process of the dammar. Immediate lacquering of the surface is necessary, as without this indispensable protective layer, the lower layers behave differently and new degradations can occur almost instantaneously[24].

[18] Brai Ioan, *The Restoration of a Lantern Clock*, in ”Brukenthal Acta Musei”, (Sibiu, 2020), 731 – 732.
[19] Bucur Mirel-Vasile, *The Restoration of a Wooden Icon from the 18th Century Painted by Nistor from Rășinari*, in ”Brukenthal Acta Musei”, (Sibiu, 2023), 710.
[20] Ibid. 710
[21] Ibid. 710.
[22] Guttmann Márta Júlia, *Aspecte teoretice ale curățirii obiectelor din lemn,* in ”Caietele Restaurării 2013”, Editura ACS, (București, 2013), 91 - 95)
[23] Coating material provided by CTS ROMANIA SRL.
[24] Ferenc Mihály, *Repictări pe mobilier de lemn din biserici transilvănene*, in ”Caietele Restaurării 2015”, Editura ACS, (București, 2015), 46.

Valorizing the restoration.

Valorization of the theoretical documentation and the integral restoration process was achieved by exposing the information gathered at a series of national conferences, participation in scientific events with the poster of the restoration, and by making this article accessible to other researchers in the field of restoration or related fields.

The restored pieces have been made to their best use thanks to the good collaboration with the specialized designer. In this way we were able to place the doors back on the iconostasis, maintaining their functional value. The fact that the pieces are back in the place of worship and were not taken out of context and displayed elsewhere is a good omen.

With the material we were able to make an observation on the age of the pieces. We have also outlined the hypothesis of replacing the imperial doors with new ones realized in the style of the original ones in a second stage and the realization of a painted decoration in a third stage. The scientific observations on pigments reinforced by their analysis in research laboratories can be a secondary dating key, and their contribution to broader research works will be noted by tracing painting materials over time according to historical periods, styles, craftsmen and religions or denominations.

We have not ventured to apply restoration procedures that we have not mastered, and we have been careful to preserve as much of the piece's past as possible. Here we strictly refer not only to the materials from which they were made, we also preserved later stages, degradations caused by chemical, biological and anthropogenic factors, and even some untouched witness surfaces with all forms of deposits that have accumulated over time[25]. The role of the restorer is not to make decisions and apply necessary treatments to save more or less old wood, painting and metal, but to preserve cultural heritage in all its stages, prolonging the uncertain existence of an object as much as possible. Let us not forget that these doors represent a later stage in the history of the church.

The specialized studies that we carried out and with which we intervened in the restoration of the pieces in a multidisciplinary approach of understanding the historical context, the technical knowledge of realization, the materials identified through specialized analysis, all applied in the restoration process imposed by the project have resulted in the present material. The certification of the quality and correctness of certain operations was discussed in each case with specialists in the field and approved by the project coordinators.

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[25] Ibid. 46.

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LIST OF ILLUSTRATIONS

Tables

Figures

4. Ensemble with the diaconate doors after restoration. Front and back sides.
5. X-ray of the diaconate door with the representation of Saint Michael. Capturing the intensity of the xylophagous insect attack in the carved panel.
6. Injection of the biocide into the structure of the diaconate doors.
7. Injection of the consolidant into the structure of the diaconate doors.
8. Detail of the surface of the diaconate door affected by the combined attack of anobides and fungi. Surface exposed to mechanical shock.
9. Test for cleaning the smoke and dust deposits on the wooden support.
10. Cleaning the linden wood support with the selected mixture.
11. The ensemble of the reverse side of the most degraded diaconate door.
12. Detail from the back of the diaconate door with the intensity of the holes produced by the xylophagous insect attack.
13. Removal of the excess of structural reinforcement.
14. Applying the paint stripper to the repainted surface.
15. The appearance of repainting after soaking it with paint remover.
16. Salts migrated from inside the panel to the surface with the evaporation of the solvent of the structural consolidator.
17. Varnishing the painting with damar resin.

ILLUSTRATIONS

	Mixtures	***Components***	***Proportions***
1	Distilled water	Water	1
2	Alcoholic water	Water + Ethanol	1:1
3	Water with C2000	Water + C2000	1:5%
4	Ammoniated water	Water + Ammonia	1:10 drops
5	Alcoholic water with C2000	Water + Ethanol + C200	1:1:5%
6	Alcoholic water and Ammonia	Water + Ethanol+ Ammonia	1:1:10 drops
7	Orange oil	Orange oil	1
8	Pine oil	Pine oil	1

9	Pine oil + Ethanol + Ammonia	Pine oil + Ethanol + Ammonia	2:1: 10 drops
* The percentages refer to the amount of substance of the total mass of the mixture in 200 ml.			

Table 1. *Tested mixtures for the cleaning of the wooden surfaces.*

	Mixtures	***Components***	***Proportions***
1	Ammoniated water	Water + Ammonia	1:5%
2	Solvanol	Isopropanol+ Water + Ethyl Alcohol	9:1:1
3	Isopropanol and Ammoniated water	Isopropanol + Water + Ammonia	2:1:2
4	Ethanol and Ammonia	Ethyl Alcohol + Ammonia	1:3%
5	Orange	Water + Acetone + Ammonia + Ethanol	1:1:5%:1
6	Acetone and Toluen	Acetone + Toluen	1:1
7	Synthetic saliva	Amylase + Lipase	1:1
* The percentages refer to the amount of substance of the total mass of the mixture in 200 ml.			

Table 2. *Tested mixtures for polychromatic cleaning.*

	Mixtures	***Components***	***Proportions***
1	D	DMF	1
2	D-X	DMF + xylene	1:1
3	D-T	DMF + toluen	1:1
4	D-A	DMF + acetone	1:1
5	D-AE	DMF + ethyl acetate	1:1
6	D-Ni	DMF + paint thinner	1:1

Table 3. *Tested mixtures for the stripping of the repainted layers.*

	Mixtures	***Components***	***Proportions***
1	WS	White spirit	1
2	WS-Ethanol	White spirit + ethanol	3:1
3	WS-A	White spirit + acetone	5:1
4	DP	Denatured Petroleum	1

Table 4. *Tested mixtures for fat and wax removal.*

	Mixtures	***Components***	***Proportions***
1	Citric acid	Citric acid + water	1:4
2	Orthophosphoric acid	Orthophosphoric acid + water	1:6
3	Orthophosphoric acid	Orthophosphoric acid + water	1:4
4	Ferric chloride	Ferric chloride	1

Table 5. *Materials used in the metal dry cleaning.*

1. Ensemble with the imperial doors before restoration. Front and back sides.

2. Ensemble with the imperial doors after restoration. Front and back sides.

3. Ensemble with the diaconate doors before restoration. Front and back sides.

4. Ensemble with the diaconate doors after restoration. Front and back sides.

5. X-ray of the diaconate door with the representation of Saint Michael. Capturing the intensity of the xylophagous insect attack in the carved panel.

6.

7.

8.

6. Injection of the biocide into the structure of the diaconate doors.
7. Injection of the consolidant into the structure of the diaconate doors.
8. Detail of the surface of the diaconate door affected by the combined attack of anobides and fungi. Surface exposed to mechanical shock.


9.

10.

11.

9. Test for cleaning the smoke and dust deposits on the wooden support.
10. Cleaning the linden wood support with the selected mixture.
11. The ensemble of the reverse side of the most degraded diaconate door.


12.

13.

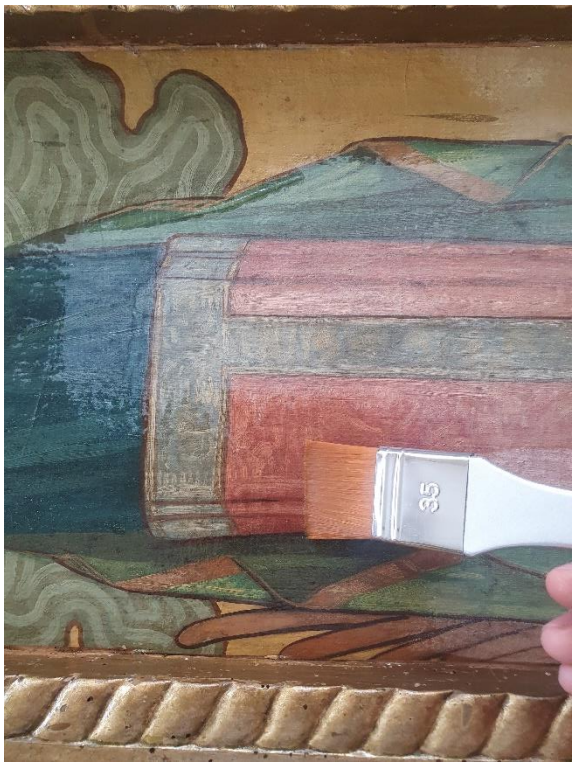
14.

12. Detail from the back of the diaconate door with the intensity of the holes produced by the xylophagous insect attack.
13. Removal of the excess of structural reinforcement.
14. Applying the paint stripper to the repainted surface.


15.

16.

15. Salts migrated from inside the panel to the surface with the evaporation of the solvent of the structural consolidator.
16. Varnishing the painting with damar resin



17. Varnishing the painting with damar resin

DISCUSSION REGARDING THE LINKS BETWEEN COLOR THEORY AND THE CHROMATIC INTEGRATION PROCESS IN PAINTING RESTORATION

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***Abstract**: The intricate relationship between color theory and the practical application of chromatic compensation in the restoration of paintings is a fascinating subject, especially considering their simultaneous emergence. However, delving deeper reveals that their trajectories did not evolve as independently as once presumed. Rather, their evolution was intricately intertwined with the burgeoning production of pigments tailored for artistic expression, a facet that warrants further exploration within this discourse. This article sheds light on the symbiotic evolution of these disciplines, highlighting their nuanced interplay and the profound impact of one on the other. Through an interdisciplinary lens, enriched by the invaluable insights of experienced restorers, this analysis delves into the intricate web of influences that have shaped both color theory and the practice of chromatic restoration.*

***Rezumat**: Relația complexă dintre teoria culorilor și practica compensației cromatice în restaurarea picturilor vechi este un subiect fascinant, mai ales având în vedere apariția lor aproximativ simultană. Cu toate acestea, explorarea mai profundă dezvăluie faptul că traiectoriile lor nu s-au dezvoltat în mod independent, așa cum se presupunea în mod tradițional. Mai degrabă, evoluția lor este una interconectată, și se află în legătură cu producția în plină expansiune a pigmenților pentru practica artistică, o fațetă care necesită explorarea mai profundă în cadrul acestui articol. El va aduce în lumină evoluția simbiotică a acestor discipline, evidențiind interacțiunea lor subtilă și impactul profund al unuia asupra celuilalt. Prin intermediul unei priviri interdisciplinare, îmbogățite cu perspective valoroase dobândite de la restauratori experimentați, această analiză se adâncește în complicata rețea de influențe care au modelat atât teoria culorilor, cât și practica integrării cromatice a picturilor.*

***Keywords** : chromatic integration, color theory, pigments*

***Cuvinte-cheie**: integrare cromatică, teoria culorii, pigmenți*

Introduction

Certainly, the process of consolidating supports or stratigraphic consolidation plays a pivotal role in the preservation of artworks, owing to their enduring nature and often definitive significance.

Following this line of reasoning, the tasks of cleaning and volumetric completion rank high in importance, as they are frequently indispensable procedures preceding chromatic integration. It is only after these initial stages that chromatic integration comes into focus. However, it is noteworthy that the success of a restoration endeavor is often judged primarily by the effectiveness of this operation - a highly visible aspect of the overall process. This final phase of restoration brings this practice closest to the realm of artistic creation, distinguishing it from mere craftsmanship. Moreover, it demands a considerable amount of innate talent to be executed effectively. Yet, despite all this, chromatic integration has been a subject of much passion, numerous controversies, and ongoing ethical debates that continue to this day.

An aspect that warrants further exploration, and one that this work aims to illuminate, is the interplay between the practice of chromatic integration and the evolution of color theory. Serving thus as a bridge between the fields of restoration and artistic creation, we can see that chromatic integration and color theory are deeply interconnected. On one hand, color theory, or chromatology, has undergone a gradual evolution over time, closely tied to the advancement of material resources for painting. Conversely, the journey of chromatic integration has been remarkable, transitioning from its historical role as a supplementary aspect of artistic practice - often involving the outright repainting of aged or damaged works - to its contemporary status as a self-reflective process of paramount importance. Rectifying the deficiencies of a painting has evolved into a pursuit guided by indisputable principles, which have, in turn, become established norms and legal requirements in the field of restoration[1].

Production of pigments

From a heritage perspective, the earliest mobile paintings trace back to the European Middle Ages, a period that started to end in the western regions of the continent around the 15th century, a period marked by the onset of the Renaissance. However, due to distinct social conditions, this era persisted until the 18th century in Romanian territories, offering a unique timeline for artistic evolution. During this epoch, the availability of pigments for painting was severely restricted. Many of the colors utilized in artworks were sourced from materials found in the apothecaries of the time and were sold for other purposes (especially the medical ones), highlighting the ingenuity of artists in utilizing the resources available to them. This scarcity of pigments not only influenced the visual aesthetics of the period but also shaped the techniques and methods employed by artists in their creative endeavors[2]. Keeping in mind that certain minerals are abundant in their surrounding environments - think mountain chalk and various ochre or brown-colored rocks - it is understandable that these hues were prominently featured in works of art. Brown tones, derived from pigments like burnt umber, burnt sienna, or Van Dyck red, held sway over the palette, both in terms of quantity and visual impact. These earthy shades dominated the surface of paintings, leaving a mark on the collective consciousness, so much so that they continue to be associated with the artistry of the 16th and 17th centuries even in contemporary times[3]. In contrast, rare and esteemed materials, when employed, tended to occupy more confined spaces within the painting, reserved primarily for prestigious commissions and serving as symbols of elevated social status. This exclusivity not only underlined the perceived value of the artwork but also reflected the patron's desire to flaunt their wealth and influence.

[1] Basil Giuseppe (Ed.), Cesare Brandi. *Restauration. Theory and Practice*, (Palermo 2015), 23-24.
[2] Stoner Joyce-Hill, Rushfield Rebecca, *Conservation of Easel Paintings*, (London and New York 2012), 190.
[3]Westphal Cristine, Knut Nicolaus, *The Restauration of Paintings*, (Cologne 1999), 269.

More to say, the utilization of such materials often came with strings attached. Artists found themselves constrained by the preferences and directives of their patrons, who wielded considerable control over the thematic content of the artwork. Instead of purely artistic pursuits, these commissions were often driven by pragmatic concerns, such as accounting and social positioning. Historical records, such as the contract preserved between Ghirlandaio and the steward of the Hospital of the Innocents in Florence, shed light on the intricate dynamics at play. They reveal the involvement of religious institutions in the allocation of various pigments for the execution of paintings, highlighting the intersection of economic and religious interests. Consequently, paintings that aligned with both economic sensibilities and religious objectives were favored, underscoring the complex interplay between art, commerce, and spirituality during this period[4]. Indeed, the focus on the strategic use of rare pigments to highlight specific elements within paintings, such as the garments of religious figures like Jesus, the Virgin Mary, or depicted saints, is a well-established and widely discussed aspect of art history.

However, it's noteworthy to highlight the limited geographic sources of these prized pigments, which further underscored their rarity and exclusivity. For instance, cinnabar, a vibrant red pigment, was primarily sourced from places like Almaden in Spain and Monte Amiata in Italy. Similarly, lapis lazuli, prized for its intense blue hue, was predominantly extracted from mines in Badakhshan, Afghanistan. Additionally, azurite, another coveted blue pigment, was sourced from various locations in Central America. By understanding the geographic origins of these rare pigments, we gain insight into the extensive trade networks and the significant value placed on these materials in the art world of bygone eras[5].

Evolution of color theory

The realm of color theory struggled to take root in these conditions, hampered by the constraints of available pigments and the absence of systematic study. Furthermore, the concept of restoration existed only in a nascent form, with the repair of old paintings often treated as an ancillary aspect of the painting process itself. Remarkably, pioneering efforts in the exploration of colors have been attributed to figures such as Orazio and Artemisia Gentileschi. However, their focus primarily revolved around the identification and characteristics of various pigments, particularly those linked to specific geographical origins. Their studies revealed intriguing nuances, highlighting how certain materials could exhibit varied tones depending on their geographic provenance. These early investigations laid the groundwork for future advancements in the understanding of pigments and their role in artistic expression[6].

While the notion of synthesizing colors might seem synonymous with modernity, historical records reveal that such methods have been employed since past times. Ancient civilizations developed ingenious techniques for color synthesis, harnessing natural processes such as corrosion, high-temperature reactions, and interactions with aqueous substances to produce vibrant hues. Undoubtedly anyhow, it was the advent of chemistry and the onset of the industrial era that ushered in a true revolution in color synthesis. The marriage of scientific knowledge with technological advancements paved the way for unprecedented innovation in the realm of pigments and dyes. With the development of synthetic compounds and industrial-scale production methods, the palette of

[4] Bourdieu Pierre, *Regulile Artei*, (București 2012), 399-403.
[5] Stoner Joyce-Hill, Rushfield Rebecca, *Conservation of Easel Paintings*, (London and New York 2012), 191.
[6] Ibid. 202

available colors expanded exponentially, transforming the landscape of artistic expression and industrial applications alike. This convergence of scientific inquiry and industrial prowess not only democratized access to a diverse array of colors but also catalyzed creative exploration across various disciplines[7]. The rapid influx of new materials into the artistic market signaled a significant turning point, introducing a plethora of colors at increasingly accessible prices. This proliferation of pigments stood in stark contrast to the arduous and intricate process of color production, which had traditionally fallen within the realm of artists' responsibilities. However, with the dawn of the industrial age, the production of pigments gradually shifted away from the hands of artists, becoming the domain of specialized manufacturers.

Among the most notable discoveries that enriched artists' palettes, several stand out for their transformative impact. Prussian blue, introduced in 1706, offered a striking hue that quickly became a staple in artistic compositions. The synthesis of chromium in 1791 opened the door to a spectrum of vibrant tones, spanning from yellow and orange to red and green. Similarly, the discovery of cadmium in 1817 and cobalt in 1735 provided artists with a versatile range of blues, violets, and other shades. Furthermore, the emergence of magenta in 1850 represented a groundbreaking addition to the color spectrum, further expanding the possibilities for artistic expression. Notably, efforts were also underway to find a safer alternative to lead white, a pigment known for its toxicity. Until the 19th century, lead white had reigned supreme as the primary white pigment on artists' palettes, underscoring its importance despite its health risks on the creators[8]. The significance of lead white in the preservation of artworks cannot be overstated. However, we also have to note its inherent drawbacks, particularly its difficulty to remove excessive repaintings, thus also posing challenges in restoration practice. It wasn't until the early 20th century that a viable alternative with similar qualities - opacity and covering power - but devoid of toxicity emerged: titanium white, a synthetic product heralded for its efficacy in painting and also in conservation efforts. All this innovations not only expanded the artistic possibilities but also facilitated more intricate color combinations and layering techniques. The proliferation of available color tones in the 19th and 20th centuries paralleled a heightened interest in color theory and the development of systems to elucidate natural optical phenomena. Chromatic systems became a focal point of inquiry, with prominent figures contributing seminal works to the field. Notable examples include Runge's color theory (1810) and the investigations of Goethe (1810) and Schopenhauer (1816) into the nature of color perception. These efforts culminated in the development of comprehensive systems such as the Munsell Color Tree (fig. 1), the Oswald Color System, and the Faber Birren Color System, which continue to shape our understanding of color theory and its practical applications in various disciplines[9].

Michel Eugène Chevreul's seminal work, first published in 1855 but originating from his extensive research dating back to 1835, stands as a cornerstone in the field of color theory. Chevreul's book synthesized a myriad of concerns related to color perception, optical phenomena, and the principles governing color interactions in an unprecedented manner. One of the pivotal aspects addressed in this work was the dispersion of sunlight into its spectral colors, a phenomenon that had been observed and studied since the groundbreaking experiments conducted by Sir Isaac Newton as early as 1676[10]. Apart from this, one of the key focal points of his research, was the phenomenon of simultaneous contrast, exerting a capital influence on the Impressionist and Post-Impressionist painters. Simultaneous contrast, as elucidated by Chevreul, refers to the distinct behavior exhibited by two adjacent colors, causing them to appear to diverge from each other in our perception. This

[7] Ibid. 201-205
[8] Westphal Cristine, Knut Nicolaus, *The Restauration of Paintings*, (Cologne1999), 266.
[9] Albers Joseph, *Interaction of Color*, (New Haven 2013), 2013, 65.
[10] Birren Faber, Itten – *The Elements of Color*, (New York 1970), 11.

phenomenon manifests not only in the optical composition of colors but also in the perceived intensity or height of their tones. Chevreul's exploration of simultaneous contrast shed light on the intricacies of human visual perception and the ways in which our brains interpret and process color information. By elucidating this phenomenon, the author provided valuable insights into the mechanisms underlying color interactions and paved the way for advancements in fields ranging from art and design to psychology and neuroscience[11]. His findings underscored the notion that our visual experience of color is often shaped by contextual factors, challenging our preconceptions and highlighting the subjective nature of color perception. They laid the groundwork for advancements in color technology, informed conservation practices in the restoration of artworks, and provided valuable insights into the integration of colors in various contexts.

Connections between the fields

As noted by the American critic Rosalind Krauss[12], exactly these concerns, initiated in the course of the 19th century, were the ones that inspired the artists of the following century, through the rectangular forms through which colors were conceptualized or analyzed (fig. 2). These tables would be the roots of a schematic, geometric, reductionist art inspired by artistic motivations for purification, in inverse proportion to the increasing availability of materials. This is nothing but abstract art, and the sometimes stringed elements are not at all foreign to chromatic integration. The practice of visually compensating the defective paintings was deeply intertwined with the artistic traditions of the past, lacking autonomy from the broader artistic endeavors of ancient times. Artists and restorers employed similar methods and materials, as the conception of art had yet to emancipate itself from the imperative of faithful representation and the creation of visually pleasing objects. As a result, the restoration of defective areas often occurred outside the scientific frameworks and ethical standards that guide contemporary restoration practices. Chromatic integration, in particular, was conducted within the context of aesthetic restoration, with the aim of enhancing the visual appeal of the artwork. However, this pursuit of "embellishment" sometimes led to the outright masking of the original painting, as restorers sought to achieve a harmonious visual unity at the expense of historical authenticity. Consequently, many artworks underwent alterations and interventions that were not always conducive to their long-term preservation or scholarly understanding.

It is only in more recent times, with the advent of modern conservation practices and the establishment of ethical guidelines, that the field of restoration has evolved into a distinct discipline with its own set of principles and methodologies. Today, restorers strive to balance the preservation of original material and artistic intent with the aesthetic considerations of presentation, ensuring that interventions are informed by rigorous scientific analysis and respect for the integrity of the artwork[13]. The need for visually completing degraded works was indeed pressing. Easel paintings, as autonomous two-dimensional visual experiences, relied heavily on the integrity of their paint layers to convey their intended impact. Degradations within these layers could significantly disrupt the intended effect of the artwork, compromising its aesthetic appeal and detracting from the viewer's engagement with the piece. Moreover, the challenge was compounded by the fact that many works by Old Masters had already been affected to varying degrees by the passage of time. Over the centuries,

[11] Chevreul Michel-Eugène, *The Principles of Harmony and Contrast of Colours and Their Application to the Arts*, (London 1855), 11-13.
[12] Krauss Epstein-Rosalind, *The Originality of the Avant-Garde and Other Modernist Myths*, (New York 1986), 15.
[13] Nicolaus Knut, Westphal Cristine, *The Restauration of Paintings*, (Cologne 1999), 370.

the vibrancy and stability of colors - aside from those containing lead white - had deteriorated, diminishing their original qualities and altering the artist's intended visual impact.

Confronted with these challenges, restorers faced the delicate task of not only addressing visible damages and losses but also restoring the visual coherence and integrity of the artwork as a whole. This necessitated careful consideration of historical context, artistic intent, and material properties, all while navigating the ethical complexities inherent in interventions on culturally significant artifacts. This required a nuanced understanding of the artwork's condition and a judicious application of restoration techniques informed by both artistic sensibility and scientific rigor[14]. The attempt to restore the initial harmony and original relationship between tones through repainting proved to be a flawed approach, primarily due to the divergent behavior of colors over time. As the original tones had already been affected by the passage of time, they followed a distinct trajectory from the repaints. These repaints, in turn, were prone to undergoing alterations themselves, such as browning and chromatic shifts, which could adversely impact the appearance of the restored works despite positive initial intentions.

Through the process of trial and error, restorers accumulated valuable experience, leading to the emergence of purist concepts rooted in trust in scientific principles, non-interventionism, and the appreciation of artworks as historical documents. These principles were later codified in restoration norms, marking a significant paradigm shift in heritage practices. However, the full realization of these principles required a technological revolution in restoration techniques. This came with the advent of varnish colors, which offered reversibility and ease of identification through the use of ultraviolet lamps. Varnish colors, specifically formulated for restoration purposes and excluding oils, emerged following the establishment of the Fratelli Maimeri factory in Italy in 1923[15], Their production mirrored the broader trend of industrializing artistic materials, providing restorers with a more effective and reliable toolset for their work. Notably, the issue of premature aging and browning of oil-based repaints had been recognized much earlier. In many cases of old paintings, retouches were made using mixtures that incorporated resin, offering the advantage of easier solubility and facilitating future restoration efforts. This historical context underscores the ongoing evolution of restoration techniques and the continual quest for innovative solutions to preserve and safeguard cultural heritage.

Let's now explore the relationship between color theory and chromatic integration. This connection is indeed primarily circumstantial, arising from the crystallization of the two domains approximately simultaneously within the general ethos of modernizing society. However, we cannot fail to notice a curious similarity between French divisionism (fig. 3) and the "ritocco" or "pointiller" method of chromatic integration (fig. 4). Instead of physically mixing pigments, they are applied in small dots, which are meant to blend in our perception when viewed from a certain distance[16]. This is consistent with the relativity of color observed in chromatology, making the treated area appear more vibrant and usually less diluted in tone. We must acknowledge that if this integration is only done within the lacuna, it entails a high degree of professionalism and represents a significant evolution from previous intentions. We also note the presence of an integration in "trateggio" (fig. 5), with thin lines in primary or secondary colors, but these do not fully cover the surface and are associated with the whitish tone of the background, thus influencing the overall chromatic appearance of the integrated area. Another practical disadvantage is that chromatic integration often needs to be done on small parts or areas with blushes, making it impossible to use this technique. When applied to large

[14] Ibid. 374
[15] https://www.maimeri.it/en/the-company.html
[16] Albers Joseph, *Interaction of Color*, (New Haven 2013), 1.

surfaces, it resembles the strange musicality of abstract paintings and is preferred, at least in our geographical area, more for integrating frescoes. Undoubtedly, we can say that this method functions as a certain intention to abstractize figurative images.

In Eastern Europe, modern chromatic integrations for visual completion of paintings are mainly done through the imitative method, influenced by a long reign of figurative options in artistic creation, as observed in this part of the continent. A mimetic integration is also preferred in Germany, a country also with a long figurative tradition, but this restoration operation has stirred the most passion in Italy, a culture that has massively contributed to the development of modern art (fig. 6). In Italy, we note the activity of the Swiss-born art historian Cesare Brandi (1906-1988), with essential contributions in the field of restoration. Parallel to the development of the abstract language of painting, a system of visible chromatic completion of defective paintings has been developed, mainly through the aforementioned "trateggio". To briefly touch on the debates that accompanied the development of this technique, we must emphasize that any chromatic integration is, in fact, a falsification, but it is necessary on aesthetic criteria to restore the unity of a work compromised over time. Any option not to integrate such areas, or to integrate them neutrally, only hinders the experience of the work as a unified aesthetic whole. Many options are permited by restauration principles, but the condition of objectivity is the one that primarily imposes itself, whatever the subjective preference towards chromatic integration technique. This must be judged according to the scale of historicity versus aesthetics, regardless of the greater preference for one or the other[17].

Conclusions

The two domains thus partially intersect, alongside their parallel evolution throughout the past century. The existence of various schools and options for visual completion has also been mentioned. It's likely that the aspect of color relativity, which brings restoration closer to chromatology, should be further developed. We already know from experience that the shade or tone of a pigment used in restoration cannot be judged on the palette alone but only once it is applied in its final place, on the surface of the painting. The initial choice remains a matter of intuition that we face, which can be easily modified later in one way or another. The reason for this lies in the relativity of color, the alteration of our perception of it due to the context in which it is viewed. As Joseph Albers has taught us, colors are almost never perceived as they are physically, but come to us in continuous flows, influenced and altered by other colors. Another aspect that brings restoration closer to the field of chromatology is the difference between additive and subtractive colors. Both variants are valid for retouching[18], but we must acknowledge that the latter is more practical and commonly used. However, aspects related to transparency as well as those related to toning versus brightness bring integration closer to the additive mixing of colors.

Regardless of the option or rather the necessity towards one technique or another of chromatic integration ("ritocco", "trattegio", mimicking neighboring colors, "glazing", etc.), this operation should be used minimally, as sparingly as possible in terms of surface area (to prolong the durability of the intervention over time) and also as objectively as possible. Discussions about wich technique of integration is more suitable will probably never cease; unfortunately, or perhaps on the contrary, the chromatic integration operation is nevertheless limited in time, a fact that offers the possibility of new future options in this regard.

[17] Basil Giuseppe (Ed.), Cesare Brandi. *Restauration. Theory and Practice*, (Palermo, 2015),19.
[18] Knut Nicolaus, Westphal Cristine, *The Restauration of Paintings*, (Cologne, 1999), 260.

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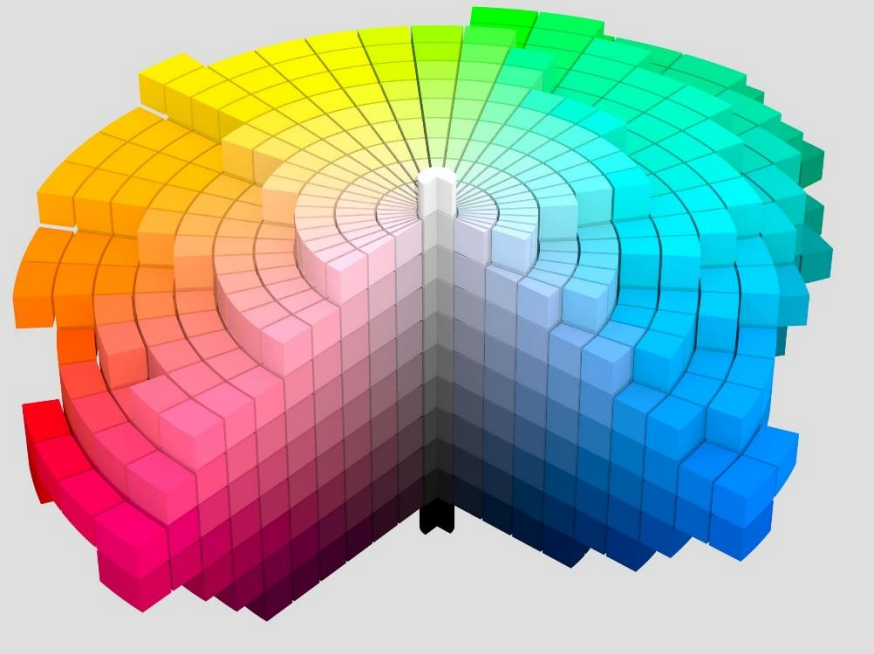
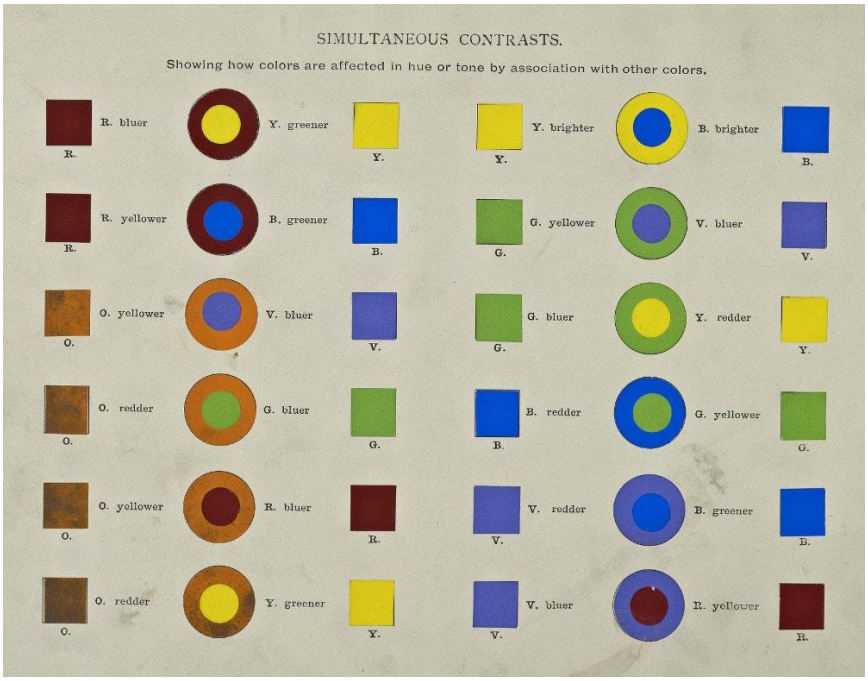
LIST OF ILLUSTRATIONS

1. Munsell Color Tree, by SharkD,
   source:
   https://upload.wikimedia.org/wikipedia/commons/1/1e/Munsell_1943_color_solid_cylindrical_coordinates_gray.png
2. Simultaneous contrasts, by Mark Maycock,
   source:
   https://publicdomainreview.org/collection/colour-wheels-charts-and-tables-through-history/
3. Hippolyte Petitjean, Le Pont Neuf,
   source:
   https://en.wikipedia.org/wiki/Divisionism#/media/File:Hippolyte_Petitjean_-_Pont_neuf.jpg
4. Ritocco integrazione,
   source:
   https://artenet.it/wp-content/uploads/2017/03/integrazione.jpg
5. Antonio Vivarini, Saint Peter,
   source:
   https://www.researchgate.net/figure/Saint-Peter-Antonio-Vivarini-Inv-20201-Avignon-Musee-du-Petit-Palais-detail-of-the_fig5_42107340
6. Ballocco Mario, Compenetrazione cromatica,
   source:
   https://museomacba.org/wp-content/uploads/2020/07/Ballocco-Mario-Compenetrazione-cromatica-1969.jpg

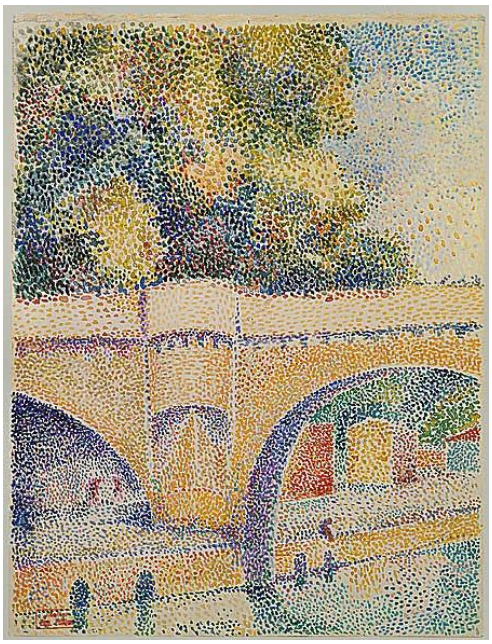
ILLUSTRATIONS



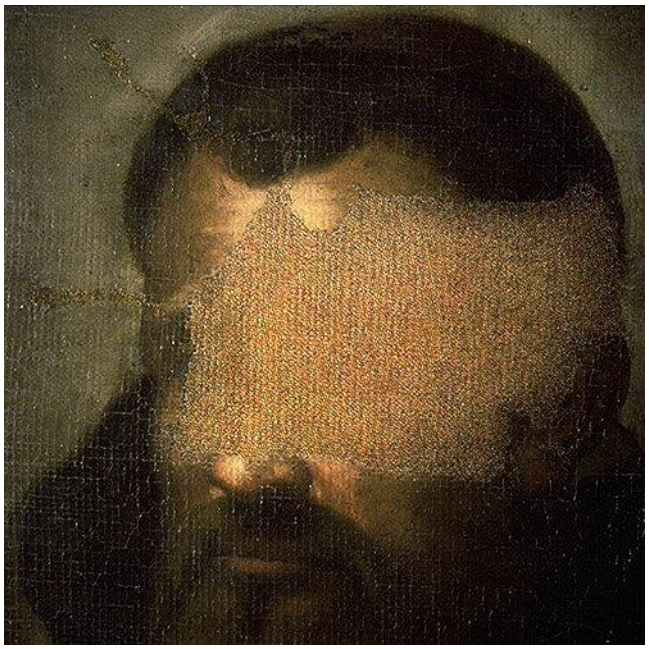
1. Munsell Color Tree, by SharkD.



2. Simultaneous contrasts, by Mark Maycock.

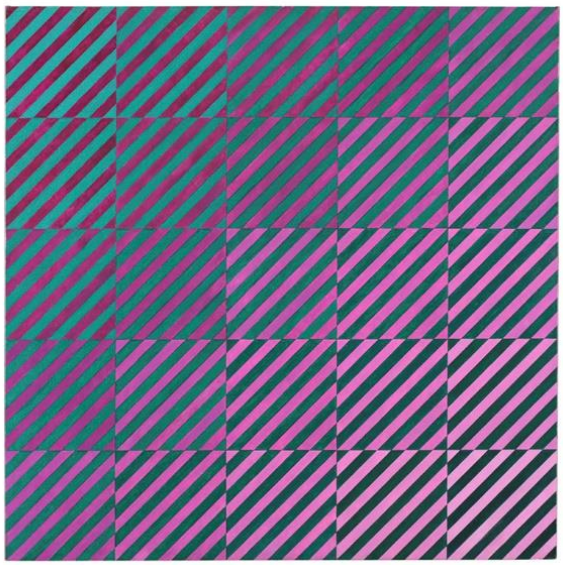


3. Hippolyte Petitjean, Le Pont Neuf.



4. Ritocco integrazione.

5. Antonio Vivarini, Saint Peter.



6. Ballocco Mario, Compenetrazione cromatica.

RESTORATION OF A 19TH-CENTURY CEREMONIAL SWORD

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Abstract*: The weapons collection of the History Museum – Altemberger House is a significant element of the Brukenthal Museum Complex in Sibiu. Due to its composition and age, this collection offers valuable insights into the evolution of weapon types used throughout the history of Transylvania. This paper focuses on the restoration process of a 19th-century ceremonial sword with a scabbard.*

Rezumat *Colecția de arme a Muzeului de Istorie- Casa Altemberger reprezintă un element important al patrimoniului Complexului Muzeal Brukenthal din Sibiu deoarece prin componența și vechimea sa oferă informații despre evoluția tipurilor de arme folosite de- a lungul istoriei Transilvaniei. Lucrarea de față se axează pe procesul de restaurare a unei săbii de paradă cu teacă din secolul al XIX lea.*

Keywords *sword, medieval, scabbard, restoration, conservation*

Cuvinte-cheie*: sabie, medieval, teacă, restaurare, conservare.*

Description of the Object

The ceremonial sword[1], catalogued under inventory number 3386, was crafted in a 19th-century Austro-Hungarian workshop[2].The main components of the sword include the following:

a) The blade is made of steel, slightly curved, and tapers to a sharp point.
b) The tang, an extension of the blade, has a rectangular cross-section and a length of 160 mm, narrowing progressively towards its end.
c) The guard is integrated with the joining arc and extends to the pommel. It is flared, perforated, and ornamented with engraved and pierced vegetal motifs, connecting seamlessly with the hilt.
d) The hilt is made of wood, covered with snake leather, and adorned with braided brass wire for decorative purposes.

[1] Vlădescu, Cristian M., Dan Popa, Carol Konig, , *Arme în muzeele din România*, București: Editura Meridiane, 1973. 53.
[2] Nițoi, Anca, *Arme și armuri în colecțiile Muzeului Brukenthal*, Altip, Sibiu- Alba Iulia, 2007 , 36.

e) The pommel, oval in shape, secures the sword's components by being threaded onto the tang's end.

The total length of the sword is 1000 mm, with the blade measuring 840 mm. The scabbard, shaped to fit the blade, is made of metal and features a suspension ring. An ornamental cord with a button is attached to the joining arc, signifying the owner's rank, role, and military achievements.

Materials Used

The sword is primarily made of steel, including the blade, scabbard, guard, and joining arc. The hilt is made of wood, covered with snake leather, and further decorated with braided brass wire.

Manufacturing Techniques

The blade was forged from steel, ground, and polished to achieve its final form. The tang was forged as an extension of the blade and mechanically finished through filing and grinding, with its end threaded to secure the pommel. The guard and joining arc were crafted as a single steel element through forging and decorated using cutting, piercing, and drilling techniques, followed by manual filing, grinding, and polishing. The hilt was carved from wood, covered with snake leather, and embellished with braided brass wire. The scabbard was made from laminated steel sheet, shaped to match the blade, and bonded at the edges using a copper alloy. The decorative cord with its button was crafted from a strip of sheep leather, onto which braided brass wire was applied, terminating in a textile-covered button.

Diagnosis

The blade and scabbard exhibited a discontinuous and uneven layer of corrosion, characterised by iron oxides, dust, and dirt embedded across the surface, alongside traces of previous protective coatings[3]. The ornamental cord with its button displayed corrosion typical of copper due to the brass wires covering it, as well as accumulated dirt and dust across its surface.

Figures 1 and 2 illustrate the sword and scabbard prior to restoration.

Restoration and Conservation

The restoration and conservation of the ceremonial sword involved a multi-step process, aimed at both preserving its historical value and ensuring its long-term stability. Initially, the sword was carefully dismantled by unscrewing the pommel, separating all components. The next step involved degreasing and washing each part to remove oils and contaminants, using acetone followed by a 1% solution of Romopal OF-10[4], a non-ionic detergent, to ensure thorough cleaning without damaging the materials.

The blade and scabbard were then subjected to mechanical cleaning with a rotary brush, effectively removing stubborn corrosion stains from the surface. This step was crucial for eliminating the oxidized layers while preserving the integrity of the metal underneath.

[3] Florescu, Radu, *Bazele muzeologiei*, București 1998. 20.
[4] Stambolov, T., *The Corrosion and Conservation of Metallic Antiquities and Works of Arts*, Amsterdam 1985, 55.

Following the cleaning process, all components were polished using felt and Autosol paste to restore their shine and smoothness, enhancing both their aesthetic appeal and functionality.

To address the remaining corrosion, the lower end of the scabbard and the inner surfaces of the guard and joining arc were treated with FerDac 1610, a rust converter that helps to neutralize rust and prevent further deterioration. This was followed by coating these areas with a 5% solution of Paraloid B-72, providing a protective layer that prevents moisture from accelerating corrosion in the future.

For final protection, the entire sword and scabbard components were coated with Balistol, a multifunctional oil that prevents rust and provides a long-lasting protective film. This final step ensured that the sword would be shielded from environmental factors, such as humidity and temperature fluctuations, which could otherwise lead to further degradation.

The ornamental cord, an important decorative element, was carefully cleaned using a fine brass brush and acetone pads to remove accumulated dirt and corrosion without damaging the delicate leather and the button fabric support. The result was a sword that not only maintained its historical significance but was also visually restored and preserved for future display.

Figures 3, 4, and 5 showcase the restored guard, joining arc, terminal pommel, hilt, and ornamental cord with its button, while Figures 6 and 7 illustrate the sword and scabbard in their final, restored form. These images highlight the careful attention to detail and the commitment to preserving the sword’s cultural and historical value.

Conclusion

The restoration of the 19th-century ceremonial sword follows a precise technological process based on evaluating its condition and specific needs. The meticulous intervention, from cleaning to final protection, ensures the sword's preservation while enhancing its historical and exhibition value. Through careful restoration, the sword becomes not only a symbol of heritage but also a valuable object for public display, providing a deeper understanding of Transylvanian history and craftsmanship for future generations. The application of professional techniques upholds both its functional and aesthetic integrity.

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LIST OF ILLUSTRATIONS

ILLUSTRATIONS

1. Sword and scabbard before restoration.

2. Sword and scabbard before restoration.

3. The guard, joining arc, and terminal pommel after restoration.

4. The sword hilt and decorative cord with button after restoration.

5. The sword decorative cord with button after restoration.

6. Sword and scabbard after restoration.

7. Sword and scabbard after restoration.

RESTORATION OF THE PAINTING "THE DEATH OF THE REVOLUTIONARY HERO PASHOPTIST ÁRON GÁBOR IN BATTLE FROM CHICHIȘ"

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***Abstract**: Abstract: This article discusses the restauration of a unique large-scale painting measuring 2.50 x 3 m titled" The Death of the Revolutionary Pashoptist Hero Áron Gábor in the battle of Chichis" The painting poses a particular challenge as it features both smooth areas and folded pictural sections. The restauration process took place at the restauration laboratory of the Brukenthal National Museum and the Székely National Museum. A notable aspect of the restauration was the creation of specially designed framework for safe transportation of the artwork.*

***Rezumat:** Articolul de față abordează tema restaurării unei lucrări inedite, cu o dimensiune relativ mare 2,50 m X 3m, intitulată: Moartea eroului revoluționar pașoptist Áron Gábor în luptă de la Chichiș" care are o problematică aparte deoarece este pictată într-o manieră lisă dar are și zone picturale împăstate. Operațiunile de restaurare s-au desfășurat în laboratorul de restaurare din Muzeul Național Brukental dar și la Muzeul Național Secuiesc. Un aspect mai deosebit a fost realizarea unui tambur pentru rularea lucrării în vederea transportului.*

***Keywords** : smooth painting, stuffed painting, Beva 371, Acrylic 33, restoration.*

***Cuvinte-cheie**: pictură lisă, pictură împăstată, Beva 371, Acril 33, restaurare.*

Conservation status

I received a request from the Székely National Museum for a large oil on canvas the restoration painting measuring, 2.50 m X 3 m. The painting, titled "The death of the revolutionary pashoptist hero Áron Gábor in the battle of Chichiș" was located in an exhibition hall that was undergoing renovation as part of the overall museum complex restauration. To ensure the preservation of the artwork, the museum staff in Sfântu Gheorghe decided to protect by placing it in on OSB Box. Due to existing cleavages, the museum conservators applied Japanese paper to the affected areas. During a visual examination, I notice scratcher gaps in the paint layer, aged varnish, and a thick layer of adhered dirt. The conservators informed us that there had been a previous restoration, but we were unable to see the back of the artwork ar determine the thickness of the paint layer at the moment. However, it was evident that certain areas exhibited a smooth color while others were heavily textured. We were able to observe parts of the frame, but the conservator confirmed that elements of the frame profile were missing.

Upon our arrival in Sibiu, we conducted an assessment in order to determine the restoration costs required materials, restoration timeline, logistics, and restoration plan. As the artwork dib not fall under the category of Treasury items, we did not need to seek approval for the restoration, proposals from the National Commission of Museums and Collections under the Ministry of Culture.

The restoration of the painting and its enhancement

The restoration project was divided into three phases. The initial phase was carried out at the Székely National Museum in Sfântu Gheorghe, where a protective layer, known as ”facing” was applied to the entire surface of the artwork. This protective layer was created using a fish glue with a concentration of 7%. Fish glue, derived from sturgeon fish since the first century, can also be obtained from skin, bones, and scales of fish, although with less purity. The fish glue used in the restoration process is known for its adhesive, elastic and colorless properties[1].

In the restoration laboratory, the artwork was delicately unrolled from transportation cylinder and positioned with the back of the painting faceing upwards onto a protective layer of bubble wrap. This allowed us to meticulously clean the back surface, removing any dust and traces of wax that were remnants of tools and equipment including scalpel blades, natural hair brushes, and a vacuum cleaner. These instruments were employed to remove wax residues and acumulated dirt restoring the artwork to its state.

Tensioning strips were created using a linen cloth with am identical thread count per square centimeter as the original cloth. In other to ensure strong adhesion between the original fabric and the doubling cloth, we selected Beva 375 gel thermoplastic adhesive. The perimeter of the cloth was second using on iron. It’s worth noting that Beva 371 is a unique adhesive in the realm of consolidation treatments. It is a multi-component mixture specifically formulated for conservation purposes, employing state-of- the-art technology available at the time. However, it is important to mention that the primary focus of our research was application as a lining adhesive. As a result, optical proprieties and stability, particulary color stability, were not thoroughly assessed, despite the potential benefits they could provide for certain conservation methods that initially recommended type of investigation. [2]

The painting required a turning operation, which involved carefully flipping it over using a specialized drum. To remove the Japanese paper, we employed damp cotton swabs soaked in lukewarm water. In order to reinforce fragile areas that may have been weakened during transportation, we applied a consolidant called Acril 33to address any cracks and enhance the adhesion of the layers. The consolidant was meticulously applied using fine, thin brushes, while deeper areas were treated with a syringe to ensure even distribution. To restore the stratigraphy to its original level, a theromosuflant was utilized, followed by applying pressure with a marble slab. Cleaning was carried out using a series of solutions for various surfaces. The selection of the cleaning solution is a complex process that considers effect within an optimal timeframe, and prioritizing the restorer’s safety by opting for solvents that are “friendlier” in terms of reduced of toxicity. Consequently, high- toxicity solvents are used sparingly, and we continuously explore alternatives with similar solubility parameters but reduced toxicity.

The varnish was easily removed using a solution of ethyl alcohol and turpentine, as well as solution consisting of acetone and White spirit. Areas with embedded dirt in the brushstrokes were

[1] Istudor, Ioan, *Noțiuni de chimia picturii*, Ed Daim publishing House, (Bucuresti, 2011), 85.
[2] Original and reformulated BEVA® 371: Composition and assessment as a consolidant for painted surfaces: Studies in Conservation: Vol 60, No 4 (tandfonline.com) accessed: 30.05.2023

meticulously cleaned with the utmost care, aided by the use of a scalpel. The lacunae were filled using a mixture of micronized mountain chalk and fish glue with a concentration of 6%. Subsequently, the filled areas werw chromatically integrated with watercolors, followed by overall retouching using varnish retouching technique. The imitative style was harmoniously integrated using Maimeri Restauro varnish colors.

The frame profiles were reconstructed using a two-component putty-Balsit. Areas that required rebuilding were filled with mountain chalk and leather glue. The filled areas were then sanded and chromatically integrated, while the profiling was enhanced with slachkmetal gilding.

The stretcher frame was custom-made at the Székely National Museum, tailored to the required size and equipped with sleepers and tensioning feathers.

After completing the restoration procedures, the painting was carefully mounted on the drum (special tube for transport) and covered with Melinex foil for protection during transportation to Sfântu Gheorghe, where it would be mounted on the new stretcher frame. The artwork required consolidation in areas with active cleavages, which was achieved by applying Acril 33 using brushing and injections techniques in the deeper areas. The painting was then mounted on a new stretcher frame, and chromatic integration was carried out only in areas where minors gaps resulting from handling and transportation were closed. The Acril 33 formulations is known for its excellent resistance to alkali and particularly recommended for use with hydraulic and non-hydraulic binders such as hydraulic lime, cement, and plaster. If can be effectively used in various conservation applications with outstanding results.[3]

Once mounted, the painting was framed and displayed on the walls protected from direct UV light.

Different lighting sources used in museums, such as natural light, fluorescent lighting and incandescent lighting, emit varying amounts of infrared (IR) and ultraviolet (UV) radiation. The source that emits the highest among of UV radiation is also the most damaging due to the higher energy of these short-wavelength rays [4]. Considering the large size and weight of the painting, it required a team of several individuals to safely left and position in the desired location.

In closing I want to mention the staff who participated in this project. From the painting restoration sector there had participated, the following expert restorers: Albișor Celestina-Florina, Cristina-Maria Fău, Ilie Mitrea, Ioan Muntean, Andrei Popa. At the moment, the painting can be viewed at the Székely National Museum, where it is displayed in the exhibition space alongside a presentation film showcasing the restoration operations. We had a great institutional collaboration, and we are thrilled to have successfully restored and highlighted on important piece of artwork for Szekler community.

Conclusion

The article provides a detailed account of the restoration process of a large-scale historical painting titled "The Death of the Revolutionary Hero Pashoptist Áron Gábor in the Battle of Chichiș", conducted in collaboration between the National Brukenthal Museum and the Székely National Museum. The project aimed to fully restore the artwork, which was affected by dirt, cracks, and traces of previous interventions, restoring its structural integrity and original aesthetics.

[3] https://www.ctseurope.com/img/cms/documentazione accessed: 30.05.2023
[4] Aurel Moldoveanu, Conservarea bunurilor culturale, (București 2003), 129.

The process included steps such as cleaning, consolidating the paint layer, refurbishing the frame, and reconstructing the stretcher. Innovative techniques were employed, including the use of specialized adhesives like Beva 371 and Acril 33, safe cleaning solutions, and chromatic reintegration of gaps using watercolors and restoration varnishes.

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LIST OF ILLUSTRATIONS

1.Drum construction (special tube for transport)
2.Application of Japanese foil to the entire surface
3.Disassembly of the work from the protective box
4.Spreading the verse
5.Running the painting on the drum (special tube for transport)
6.Protective the painting with foil
7.Removing the painting from the drum (special tube for transport)
8.Removing dirt from the back
9.Removal of traces of glue from the previous restoration
10.Preparation of doubling bands
11.Fastening of doubling strips
12.The return of the painting
13.Highlighting of fragile areas to be consolidated
14.Bringing back to stratigraphy and putting it in the press.
15.Removing aged vernis and cleaning up adherent dirt
16.Grouting of lacunar areas
17.Integration of putty areas
18.Removing the cloth from the drum
19.Consolidation of cleavage areas
20.Anchoring the work on the new chassis
21.Frame assembly
22.Fixing the work in the frame with the metal blades
23. Lifting the work on the exhibition
24.The final chromatic retouch
25.The ensemble of the final work

ILLUSTRATIONS

1. Drum construction (special tube for transport)

2. Application of Japanese foil to the entire surface

3. Disassembly of the work from the protective Box

4. Spreading the verse

5. Running the painting on the drum (special tube for transport)

6. Protective the painting with foil

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11. Fastening of doubling strips

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25. The ensemble of the final work

’COMMENTARIUS IN EVANGELIUM JOHANNIS APOSTOLI ET EVANGELISTAE’ MANUSCRIPT: CONSERVATION, ANALYSIS AND RESTORATION

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Abstract *The manuscript Commentarius in Evangelium Johannis Apostoli et Evangelistae, attributed to Rupertus Tuitiensis and transcribed by two unknown scribes in the 15th century, belongs to the medieval manuscript collection of the Brukenthal National Museum – Brukenthal Library. This paper provides a detailed description of the manuscript, its conservation state, the crafting techniques used in its creation, and the analysis of its paper, parchment, and leather components using optical microscopy. The interventions undertaken for the conservation and restoration of the manuscript are also described.*

Rezumat: *Manuscrisul, Commentarius in Evangelium Johannis apostoli et evangelistae, autor Rupertus Tuitiensi, 2 copiști necunoscuți, sec.15 , face parte din colecția de manuscrise medievale ale Muzeul Național Brukenthal- Biblioteca Brukenthal.*

In articol este prezentată descrierea cartii manuscris, starea de conservare, detaliile de realizare și studiul prin microscopie optică a suporturilor din hârtie, pergament și piele. Sunt descrise intervențiile efectuate pentru conservarea și restaurarea manuscrisului.

Keywords: *manuscript on paper and parchment, conservation, restoration, optical microscopy.*

Cuvinte-cheie*: manuscris pe hartie si pergament, conservare, restaurare, microscopie optica.*

A. Description of the Manuscript

Three manuscripts authored by Rupertus Tuitiensi[1] were received for restoration by the Laboratory of Conservation, each differing in structure. This paper focuses on the restoration of the

[1] Rupert of Deutz (in Latin *Rupertus Tuitiensis*; c. 1075/1080 – c. 1129) was an influential Benedictine theologian, exegete, and writer on various liturgical and musical topics. He is regarded as one of the greatest

second manuscript, *Commentarius in Evangelium Johannis Apostoli et Evangelistae*. This 15th-century manuscript is part of the Brukenthal Library collection and is catalogued under inventory number Ms.x694, with the old identification number IX, Q.a.10.

The manuscript's original dimensions are 230 mm in length, 200 mm in width, and a variable thickness ranging from 65 mm at the spine to 80 mm at the outer edge (Fig.1.a.b.c.d.). The manuscript block consists of 260 manually-produced paper folios, each measuring 225 mm in length, 150 mm in width, and with a variable thickness of 1.8–2.0 mm (Fig.2. a.b.c.). The pages are numbered in Arabic numerals by a museum curator using pencil in the upper-right corner. The text is written in a single column format.

The manuscript text displays variations in its formatting:

- Pages 1–12 contain 28–29 lines of text within a text frame measuring 175 mm in length and 90 mm in width.
- Pages 12–48 also contain 28–29 lines, with text frames measuring 170 mm in length and 90–100 mm in width, filled with corrections and additions.
- Pages 48–60 feature 25 lines, with text frames of 160 mm by 100 mm.
- Pages 60 onwards return to 28–29 lines, within a text frame of 160 mm by 100 mm.

The text frames were delineated in black ink prior to writing. The text is written in Latin in black ink, with no chapter titles. Paragraphs within chapters commence three spaces inward on three separate lines. Marginal corrections and annotations are present on pages 1–49.

The covers are made of parchment with the following characteristics:

- Front cover: 210 mm by 140–145 mm, with a thickness of 0.4–0.5 mm.
- Back cover: 210 mm by 215 mm, with a thickness of 0.4–0.5 mm.
- Spine: crafted from bovine leather[2] and measuring 210 mm in length, 50 mm in width, and 3 mm in thickness.

The binding is original, using cotton cords and five ornamental raised bands. The two fastening straps have been replaced by tying cords. The endpapers are missing, except for one loose leaf (Fig.3.a.b.c.).

B. Conservation State

The manuscript is composed of paper, parchment, and leather. The evaluation of its conservation state revealed physical, chemical, and biological damage:

Paper

theologians of the early twelfth century. For further information see John Van Engen's "Rupert of Deutz" (University of California Press, 1983) provides a comprehensive study of Rupert's theological contributions and his role in 12th-century religious thought.
Eliane Poirot's "Les prophètes Élie et Élisée dans l'œuvre de Rupert de Deutz" (2017) focuses on Rupert's biblical exegesis and his interpretation of prophetic figures.
Collected works and critical editions, such as "Opera Omnia" (Latin), are available from publishers like Brepols and Cerf under the "Sources Chrétiennes" collection.

[2] Miu Lucretia, (coordinator), *Evaluarea degradării obiectelor de patrimoniu din piele si pergament*, Editura Performantica, (Iasi,2005), 23.

The manuscript folios are made from handmade paper containing a watermark (Fig.4). Observed deterioration includes dust deposits, ingrained dirt, ink and unidentified stains, moisture halos, marginal fraying, tears, perforations, folds, material loss, and general yellowing due to photochemical degradation. Biologically, foxing spots and rodent damage are present. Human handling has caused additional damage, including burnt edges on pages 1–42. The manuscript block has lost its flatness (Fig.5 a. b. c. d. e).

Parchment

The parchment covers, identified as bovine through follicle patterns observed under magnification, exhibit dust deposits, ingrained dirt, soot, ink, and unidentified stains[3]. The covers display exfoliation, scratches, tears, creases, and material loss, rendering them brittle and darkened across their surface. Defects from the original processing, such as hair follicle traces, are visible. Inactive biological damage, including mould and morphophysiological deposits, is also evident (Fig.6 a. b. c. d. e.).

Leather

The spine, made of bovine leather, shows signs of dust deposits, ingrained dirt, various stains, scratches, minor cracks, discolouration, and dehydration. The leather has become rigid and brittle.

Binding Cords

The cotton cords used in the binding are covered in ingrained dirt (Fig. 7a.b.).

C. Optical Microscopy Analysis

The surface of the book was examined using optical microscopy, including the covers, pages, and spine, to assess its conservation state. The images captured (microphotographs) at various magnifications illustrate the details of the analysed surfaces, making visible their specific characteristics.

Microphotographs of the front cover made of parchment highlight its condition: detail of the upper left corner (Fig. 8), an irregular surface (Fig. 9), a visible scuff mark (Fig. 10), stains (Fig. 11), a single stain (Fig. 12), surface roughness (Fig. 13), and a crack (Fig. 14). Additional details include a stain (Fig. 15) and further visualisations of the surface's condition (Figs. 16, 17, 18, 19, and 20).

The paper pages within the book block were also examined through optical microscopy. These studies revealed ruptures with material loss (Fig. 21), visible writing on the surface of a page (Fig. 22), a stain (Fig. 23), and the general state of the interior pages (Fig. 24). Additional details show the writing's appearance (Fig. 25), the page edges (Fig. 26), and further interior surface observations (Fig. 27). The condition of the book's pages is further illustrated in microphotographs (Figs. 28, 29, 30, and 31).

The back cover made of parchment was similarly analysed, revealing its overall state. Observations included details of its surface (Fig. 32), a stain (Fig. 33), surface roughness (Figs. 34 and 35), another stain (Fig. 36), a combination of roughness and stains (Fig. 37), and additional stains (Fig. 38). Irregularities of the surface are evident (Fig. 39), along with perforations (Fig. 40). The back cover's overall appearance is documented in further microphotographs, including scuff marks (Fig. 42) and its edges (Fig. 43).

The leather spine of the book was also subjected to optical microscopy, with the surface condition detailed in microphotographs (Figs. 44, 45, and 46).

[3] Chiriță Gh. *Tehnologia pieilor și a blănurilor* / vol. I, Editura Tehnică, (București, 1983), 62.

This thorough examination provides a detailed view of the conservation state of the book, documenting areas of deterioration, wear, and material loss across its various components.

D. Restoration Interventions

The restoration adhered to the principle of "minimal intervention."

Paper

Procedures included dry and wet cleaning, repair of tears and fragile areas, filling material losses, and reformatting .(Fig.47 a.b.). The pages with burned areas were considered to hold historical information, and interventions were limited to stabilising the paper..

Parchment

Cleaning, humidification, adhesion, consolidation, and chromatic reintegration were performed on the parchment covers (Fig.48).

Leather

The leather spine underwent dry and wet cleaning, hydration, and localised consolidation.

Materials and methods used in the restoration included specialised erasers, brushes, chemical sponges, scalpels, mini-vacuums, Japanese paper, cotton swabs, Gore-Tex membranes, distilled water, ethyl and isopropyl alcohols, carboxymethyl cellulose, polyvinyl acetate, and other appropriate conservation substances.

The restoration process was documented photographically, including before-and-after images, as well as intermediate stages. The restored manuscript was pressed to regain its flatness and stored in a custom-made conservation box.

Final Dimensions

The restored manuscript measures 230 mm in length, 165 mm in width, and 65 mm in thickness.

Storage Recommendations

The manuscript should be stored in a stable environment with a temperature of 16–18°C, relative humidity of 40–50%, light intensity below 50 lux, and an air filtration system[4]. Periodic conservation assessments should occur every three months.

E. Conclusion

The restoration of the manuscript Commentarius in Evangelium Johannis apostoli et evangelistae represents a complex and detailed process aimed at preserving both its physical condition and historical significance. Through careful examination and the application of advanced techniques, including optical microscopy, each stage of restoration—whether for the parchment, paper, or binding—was performed with utmost respect for the manuscript's integrity. The project not only contributes to safeguarding an invaluable cultural asset but also enhances its accessibility for future generations. By integrating conservation with scholarly research, the manuscript's relevance in both historical and academic contexts is further cemented.

[4] Kite Marion, Thomson Roy, *Conservation of Leather and Related Materials*, (Elsevier Ltd 2006), 209.

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LIST OF ILLUSTRATIONS

1. Pre-Restoration Condition of the Covers and Spine
    a. Front cover before restoration
    b. Back cover before restoration
    c. Spine before restoration
    d. Text block edge before restoration
2. Details of Specific Pages
    a. Detail of pages 60–61: differently sized text box
    b. Detail of page 152: text box
    c. Detail showing corrections and marks on the text margins
3. Pre-Restoration Condition of Components
    a. Back endpaper before restoration
    b. Back cover (parchment), inner side, and book block
    c. Front cover (parchment), inner side
4. Text Block Condition
    Detail showing the book block with dust and dirt deposits
5. Damage to the Book Block and Pages
    a. Detail of the book block: material loss, cracks, perforations, folds
    b. Pages 248–249: water stains, yellowing of leaves
    c. Detail showing dirt deposits, water stains, and frayed edges
    d. Detail showing material loss, cracks, perforations, folds

e. Water stains, material loss, scorched leaves, yellowing

6. Various Deterioration Issues

a. Dirt deposits, stains of unknown origin, rigid areas, waviness

b. Scratches, cracks, areas with material loss

c. Fragility and browning, zones with material loss

d. Scratches, cracks, stains of unknown origin

e. Exfoliation, scratches, cracks, dehydration, and torn areas without material loss

7. Encrustation, Stains, and Degradation

a. Adherent dirt, encrustation, various stains, scratches, small cracks

b. Discolouration, rigid areas, dehydration

Figures 8–46: Detailed Microphotographs

8. Detail of the surface of the front cover (parchment), upper left corner, microphotograph 20x.

9. Detail of the surface of the front cover (parchment), showing an irregular aspect, microphotograph 40x.

10. Detail of the surface of the front cover (parchment), showing a scuff mark, microphotograph 40x.

11. Detail of the surface of the front cover (parchment), showing stains, microphotograph 40x.

12. Detail of the surface of the front cover (parchment), showing a stain, microphotograph 20x.

13. Detail of the surface of the front cover (parchment), showing roughness, microphotograph 40x.

14. Detail of the surface of the front cover (parchment), showing a crack, microphotograph 40x

15. Detail of the surface of the front cover (parchment), showing a stain, microphotograph 40x.

16–20. Various details of the surface of the front cover (parchment), microphotograph 40x.

21. Detail of the surface of the book block, showing a tear, microphotograph 20x.

22. Detail of a page from the book, showing writing, microphotograph 40x.

23. Detail of a page from the book, showing stains, microphotograph 40x.

24. Detail of the interior of the book, showing pages, microphotograph 40x.

25. Detail of a page surface from the book, showing writing, microphotograph 40x.

26. Detail of a page surface from the book, showing the edge, microphotograph 40x.

27. Detail of the interior of the book, microphotograph 20x.

28–31. Various details of a page surface from the book, microphotograph 40x.

32. Detail of the surface of the back cover (parchment), microphotograph 40x.

33. Detail of the surface of the back cover (parchment), showing a stain, microphotograph 40x.

34–35. Details of the surface of the back cover (parchment), showing roughness, microphotograph 40x.

36. Detail of the surface of the back cover (parchment), showing a stain, microphotograph 40x.

37. Detail of the surface of the back cover (parchment), showing roughness and a stain, microphotograph 40x.

38. Detail of the surface of the back cover (parchment), showing a stain, microphotograph 40x.

39. Detail of the surface of the back cover (parchment), showing an irregular aspect, microphotograph 40x.

40. Detail of the surface of the back cover (parchment), showing perforations, microphotograph 20x.

41. Detail of the surface of the back cover (parchment), microphotograph 40x.
42. Detail of the surface of the back cover (parchment), showing a scuff mark, microphotograph 20x.
43. Detail of the edge of the back cover (parchment), microphotograph 40x.
44–46. Details of the leather spine, microphotograph 20x
47–49: Post-Restoration Details
47. a. Book block after restoration
    b. Book block after restoration
48. Detail of the parchment cover after restoration
49. a. Front cover after restoration
    b. Back cover after restoration
    c. Spine after restoration
    d. Text block edge after restoration

ILLUSTRATIONS


a.

b.

c.

d.

1.Pre-Restoration Condition of the Covers and Spine: a. Front cover before restoration; b. Back cover before restoration; c. Spine before restoration; d. Text block edge before restoration

 a.  b.  c.

2. Details of Specific Pages: a. Detail of pages 60–61: differently sized text box; b. Detail of page 152: text box; c. Detail showing corrections and marks on the text margins

 a.  b.  c.

3. Pre-Restoration Condition of Components: a. Back endpaper before restoration, b. Back cover (parchment), inner side, and book block, c. Front cover (parchment), inner side

4. Text Block Condition, Detail showing the book block with dust and dirt deposits

 a.  b.

 c.  d.  e.

5. Damage to the Book Block and Pages: a. Detail of the book block: material loss, cracks, perforations, folds; b. Pages 248–249: water stains, yellowing of leaves;c. Detail showing dirt deposits, water stains, and frayed edges; d. Detail showing material loss, cracks, perforations, folds; e. Water stains, material loss, scorched leaves, yellowing

 a.  b.  c.
 d.  e.

6. Various Deterioration Issues: a. Dirt deposits, stains of unknown origin, rigid areas, waviness; b. Scratches, cracks, areas with material loss; c. Fragility and browning, zones with material loss; d. Scratches, cracks, stains of unknown origin; e. Exfoliation, scratches, cracks, dehydration, and torn areas without material loss

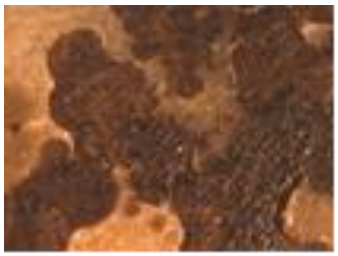
 **a.**  **b.**

7. Encrustation, Stains, and Degradation: a. Adherent dirt, encrustation, various stains, scratches, small cracks; b. Discolouration, rigid areas, dehydration

Detailed Microphotographs:

 8.  9.  10.

8. Detail of the surface of the front cover (parchment), upper left corner, microphotograph 20x.
9. Detail of the surface of the front cover (parchment), showing an irregular aspect, microphotograph 40x.
10. Detail of the surface of the front cover (parchment), showing a scuff mark, microphotograph 40x.


11.

12.

13.

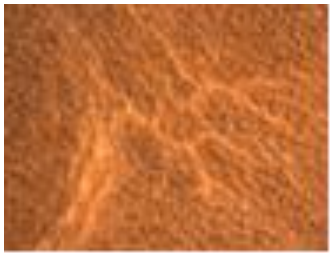
11. Detail of the surface of the front cover (parchment), showing stains, microphotograph 40x.
12. Detail of the surface of the front cover (parchment), showing a stain, microphotograph 20x.
13. Detail of the surface of the front cover (parchment), showing roughness, microphotograph 40x.


14.

15.

16.

14. Detail of the surface of the front cover (parchment), showing a crack, microphotograph 40x
15. Detail of the surface of the front cover (parchment), showing a stain, microphotograph 40x.
16. Various details of the surface of the front cover (parchment), microphotograph 40x.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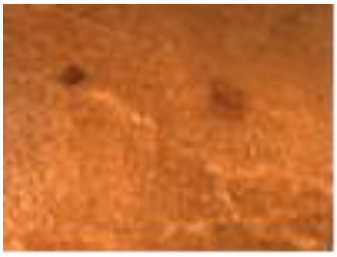
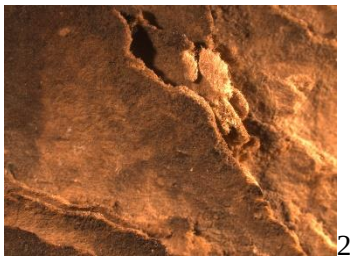
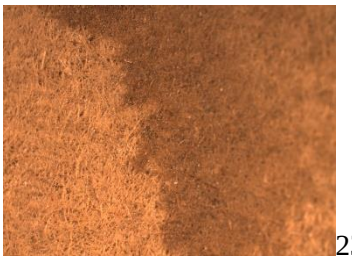

19.

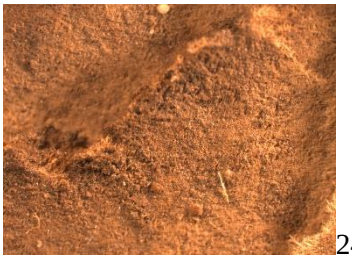
20.

17–20. Various details of the surface of the front cover (parchment), microphotograph 40x.


21.

22.

23.

21. Detail of the surface of the book block, showing a tear, microphotograph 20x.
22. Detail of a page from the book, showing writing, microphotograph 40x.
23. Detail of a page from the book, showing stains, microphotograph 40x.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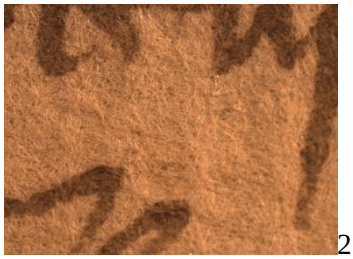

25.

26.

24. Detail of the interior of the book, showing pages, microphotograph 40x.
25. Detail of a page surface from the book, showing writing, microphotograph 40x.
26. Detail of a page surface from the book, showing the edge, microphotograph 40x.


27.

28.

29.

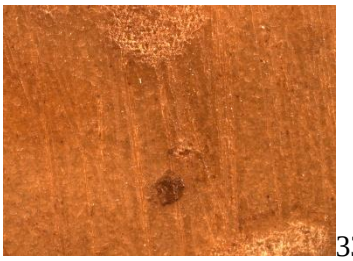
27. Detail of the interior of the book, microphotograph 20x.
28–29. Various details of a page surface from the book, microphotograph 40x.


30.

31.

32.

30–31. Various details of a page surface from the book, microphotograph 40x.
32. Detail of the surface of the back cover (parchment), microphotograph 40x.


33.

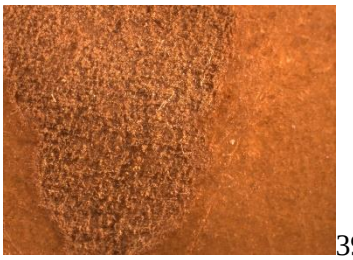
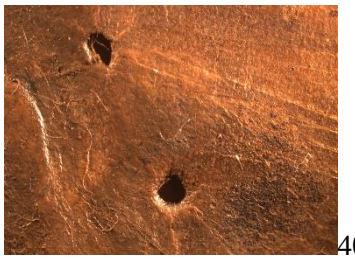
34.

35.

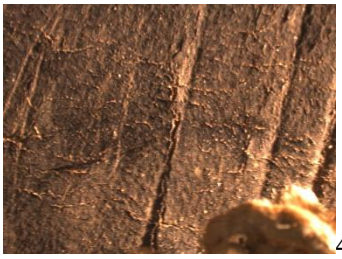
33. Detail of the surface of the back cover (parchment), showing a stain, microphotograph 40x.
34–35. Details of the surface of the back cover (parchment), showing roughness, microphotograph 40x.

 36.
 37.
 38.

36. Detail of the surface of the back cover (parchment), showing a stain, microphotograph 40x.
37. Detail of the surface of the back cover (parchment), showing roughness and a stain, microphotograph 40x.
38. Detail of the surface of the back cover (parchment), showing a stain, microphotograph 40x.

 39.
 40.
 41.

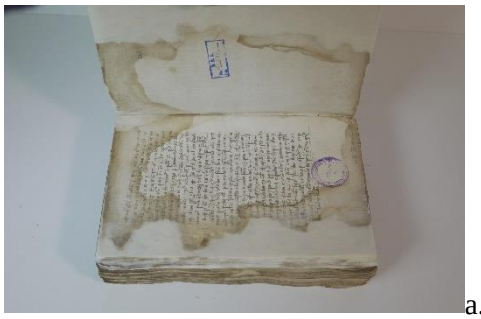
39. Detail of the surface of the back cover (parchment), showing an irregular aspect, microphotograph 40x.
40. Detail of the surface of the back cover (parchment), showing perforations, microphotograph 20x.
41. Detail of the surface of the back cover (parchment), microphotograph 40x.

 42.
 43.
 44.

42. Detail of the surface of the back cover (parchment), showing a scuff mark, microphotograph 20x.
43. Detail of the edge of the back cover (parchment), microphotograph 40x.
44. Details of the leather spine, microphotograph 20x

 45.
 46.

45–46. Details of the leather spine, microphotograph 20x


a.

b.

47. a. Book block after restoration; b. Book block after restoration

48. Detail of the parchment cover after restoration


a.

b.

c.

d.

49. a. Front cover after restoration; b. Back cover after restoration; c. Spine after restoration; d. Text block edge after restoration

RESTORATION OF THE HEARTH ICON OF *SAINT PARASKEVA* FROM THE COLLECTION OF THE ASTRA MUSEUM

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***Abstract**: The hearth icon of Saint Paraskeva, dating from the 20th century and specific to the area of Oltenia, benefitted from minimum restoration interventions within the 7th edition of the Restoration Workshop organized by the ASTRA Museum in Sibiu through the ASTRA Centre for Heritage. The restoration operations respected the principle of the minimum intervention, considering the functional wear existant at the level of the color film. Besides the chemical and biological investigations, X-ray fluorescence analyses were carried out during this event. Hearth icons used to be placed inside the chimney above the hearth and their role was to protect the home against evil spirits.*

***Rezumat**: Icoana de vatră Sfânta Paraschiva, icoană de secol XX specifică zonei Olteniei, a beneficiat de intervenții minime de restaurare în cadrul Workshop-ului de restaurare, ediția a VII-a, organizat de Muzeul ASTRA din Sibiu prin Centrul ASTRA pentru Patrimoniu. Operațiile de restaurare au respectat principiul minimei intervenții, având în vedere uzura funcțională existentă la nivelul peliculei de culoare. Pe lângă investigațiile chimice și biologice, în cadrul evenimentului s-au efectuat analize cu spectrometrul de fluorescență de raze X. Icoanele de vatră se poziționau în trecut în zona hornului de deasupra vetrei și aveau rol de protecție a casei împotriva spiritelor rele.*

***Keywords**: Ecclesiastical heritage, restoration project, pigment analyses, ecclesiastical sculpture, ironwork.*

***Cuvinte-cheie**: Sfânta Paraschiva, icoană de vatră, consolidare, restaurare, valorificare.*

Introduction

The hearth icon with the scene *Saint Paraskeva* (Fig. 1), inv. no. 8762 AL (Fig. 2), has been restored because of its precarious state of conservation. Thanks to its utility, the hearth icon displays the phenomenon of aging and browning of the painting layers. The size of the icon according to our measurements is between 24.2-24.3 x 19.2-19.7 cm.

The status of conservation of the icon before restoration was conditioned by the aging of the materials[1] and faulty conservation. The degradation factors have particularly led to the browning, wear and loss of the painting layers. The icon is incised and painted on a panel of hardwood. The panel has a crackling which has a correspondent on the face of the icon (in the lower central register), inactive attack of boring insects *Anobium punctatum*, superficial and adherent depositions. On the back of the panel the inventory number *8762* is written out. On the back, we can also read *HOREZU I*.

The physical-chemical and biological analyses carried out have supplied essential data in order to perform the restoration interventions[2].

The chemical investigations [3] consisted in macroscopic and microscopic examinations, microchemical and burning tests, solubilizations, digital microphotographs. The microchemical analysis was carried out (Fig. 3) in order to identify the red hematite pigment mixed with another red pigment (possibly cinabre red) and the existant protein binder (egg). The preparation layer cannot be distinguished. The chemical investigations were corroborated with the physical-chemica [4] determinations through the method of X-ray fluorescence[5].

Biological investigations

Following the results of the biological analyses[6] it was noted that the wood used for the panel was poplar *Populus sp*. (Fig. 4). The wood presents inactive attack of biodegradation agents and therefore did not require treatment with insecticide solution.

Description of the restoration operations

The physical-chemical and biological investigations carried out have given us essential data for the restoration operations[7] (Fig. 5-18).

Preliminary operations:

- mechanical cleaning of the painting layers with soft brushes (dusting);
- prophilactic consolidation of the painting layers with 3% fish glue solution with added preservative (0.1% acetyl-salicylic acid).

Restoration operations carried out on the metallic hanging element:

- mechanical cleaning with steel wool of the metallic nail used as hanger, situated on the upper

[1] Mirel-Vasile Bucur, *Intervenții de restaurare în cazul ușilor împărătești de la biserica de lemn din Comănești, județul Gorj.* In: *Cibinium,* (Sibiu 2015), p. 216.

[2] Coordinator of the 7th edition of the *Restoration Workshop*, expert painting restorer, Assoc. Prof. Alina Geanina Ionescu, PhD - ULBS, director of ASTRA Centre for Heritage, ASTRA Museum Sibiu; Specialised practice Year III, Sem. I, 2022-2023, Specialization Conservation and Restoration, Departament of History, Heritage and Protestant Theology, Faculty of Social and Human Sciences, "Lucian Blaga" University Sibiu: Antonescu Ștefan, Bogoslov Elena-Andreea, Bugner Mădălina, Chiver Andreea, Ciuc Desia Serafima, Cocoșel Doris Susana, Codrea Diana Ioana, Duminică Georgiana, Ioaneș Alexandra, Jibleanu Maria, Niță Ioana Antonia, Păcurar Diana-Antonia, Vasiu Dan; Restoration and specialized assistance C.N.M. ASTRA: restorers Florin Păun, Anamaria Rotaru, Șerban Lazăr.

[3] According to Analysis Bulletin No. 831/2023 – expert chemist investigator Daniela Văcariu, C.N.M. ASTRA.

[4] Ana Maria Vlad, Gheorghe Niculescu, *Metode instrumentale de analiză în artă și arheologie*, Editura Performantica, Iași (2013), p. 52.

[5] Scientific support provided by expert chemist investigator Gheorghina Olariu.

[6] According to Analysis Bulletin No. 35/2023 – expert biologist investigator Ileana Chirtea, C.N.M. ASTRA.

[7] Coordinator of the 7th edition of the *Restoration Workshop*, expert painting restorer, Assoc. Prof. Alina Geanina Ionescu, PhD - ULBS, director of ASTRA Centre for Heritage, ASTRA Museum Sibiu; Restoration and specialized assistance: restorers Anamaria Rotaru, Florin Păun, Șerban Lazăr, Gheorghe Caraji, Ana Eugenia Mailat, Sorina Mihăescu, Ana Maria Cernica.

edge of the icon;

- coating with Paraloid B72 in 1% ethyl acetate.

Restoration operations at the layer of the wooden support:

- dusting of the back and edges of the icon with big, rough brushes, by removing the superficial depositions;
- cleaning of the adherent depositions from the back of the icon and on the edges of the panel with weak mix of solvents, ammonia water (3 drops of NH_4 in 100 ml distilled H_2O);
- chromatic integration in the areas with functional wear with water based stain, in the chromatic of the wood.

Restoration operations at the level of the painting layers:

- actual consolidation of the painting layers[8] with 6% fish glue solution, by using the warm press (electric spatula) and cold press (small bags of sand and pieces of marble), with the help of the transparent and non-adherent monosiliconated polyester film;
- removal of the Japanese foil from the surface of the consolidated painting layers with swabs dipped in warm water, the surplus of water being removed with dry cotton swabs;
- cleaning of the painting layers, following the cleaning tests, with mixtures based on isopropanol + ammonia + water (80:10:10) and (50:25:25);
- partial chromatic integration with imitative and punctiform retouching through watercolors.

Note:

We did not varnish the hearth icon, as it did not have any protection layer initially.

Storage recommendations

We recommend the hearth icon of *Saint Paraskeva* (Fig. 19-20) be stored or exhibited in an environment with relative humidity between 50-65%, temperatures between 18-20°C, without any ample or sudden fluctuations of these values and for the lighting to not exceed 180 lux.

Conclusions

With regard to the development plan of the Restoration Workshop we want to capitalize on the knowledge and skills acquired in the research activity, to extend the professional achievements and to transmit to young students, master's or graduate students in the Conservation-Restoration Specialization the courage to explore, research and train in the field of heritage conservation and restoration.

[8] Sandro Baroni, *Restauration et conservation des tableaux - manuel pratique*, Paris (1992), p. 123.

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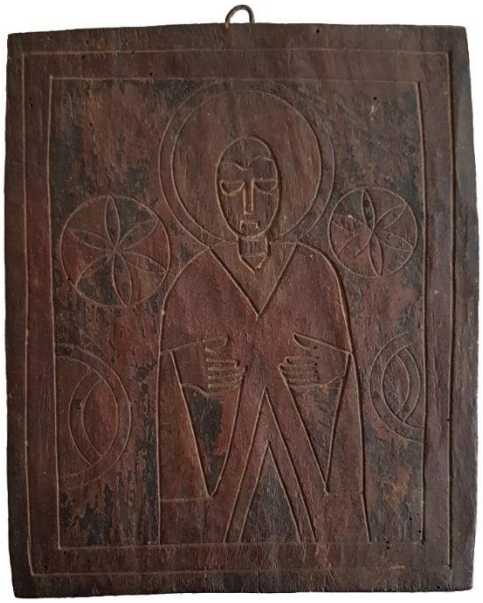
Ana Maria Vlad, Gheorghe Niculescu, *Metode instrumentale de analiză în artă și arheologie*, Editura Performantica, (Iași, 2013).

LIST OF ILLUSTRATIONS

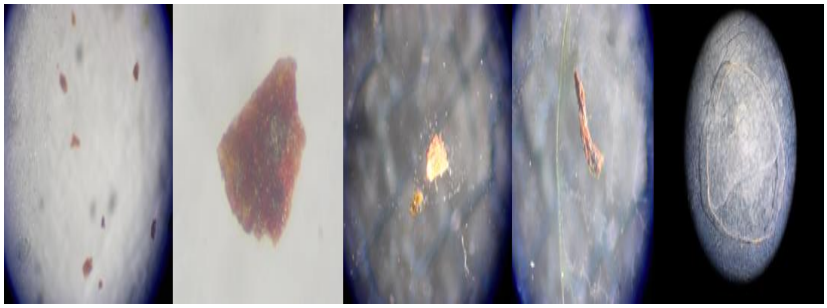
1. Front-back before restoration
2. Front-back before restoration
3. Microscopic images of the samples taken and of the microchemical tests
4. Microscopic image - poplar tree *Populus sp*.
5. During the 7th edition of the *Restoration Workshop*
6. During the 7th edition of the *Restoration Workshop*
7. During mechanical cleaning and prophilactic consolidation
8. During mechanical cleaning and prophilactic consolidation
9. During mechanical cleaning of the metallic nail used as a hanger and during the Paraloid coating
10. During mechanical cleaning of the metallic nail used as a hanger and during the Paraloid coating
11. During interventions on the wood support
12. During interventions on the wood support
13. During interventions on the wood support
14. During interventions on the painting layers
15. During interventions on the painting layers
16. During interventions on the painting layers
17. During interventions on the painting layers
18. During interventions on the painting layers
19. Front-back after restoration
20. Front-back after restoration

ILLUSTRATIONS

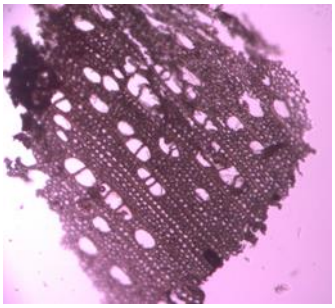


1- Front-back before restoration

2. Front-back before restoration



3. Microscopic images of the samples taken and of the microchemical tests



4. Microscopic image - poplar tree *Populus sp*.

5-6. During the 7th edition of the *Restoration Workshop*

7-8. During mechanical cleaning and prophilactic consolidation

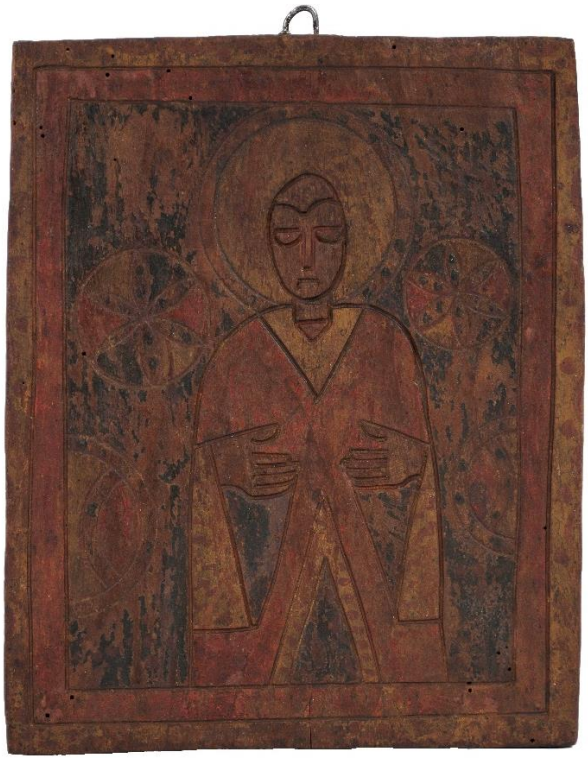
9-10. During mechanical cleaning of the metallic nail used as a hanger and during the Paraloid coating

11-13. During interventions on the wood support





14-18. During interventions on the painting layers




19-20. Front-back after restoration

CONSERVATION OF A 17TH-CENTURY ENGRAVING DEPICTING THE MARTYRDOM OF SAINT SEBASTIAN

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***Abstract**: The Saint Sebastian engraving, crafted on handmade paper, exhibited significant deterioration due to physical, photochemical, physicochemical, and biological factors, including tears, discoloration, and improper mending. The restoration process included dry cleaning, removal of paper strips, alignment and mending of tears, consolidation, pressing, and inpainting. These treatments successfully restored the artwork's structural integrity and visual continuity. A poster detailing the conservation process was presented at the "Magia Restaurării" exhibition at the Brukenthal Palace, showcasing the intricate work involved in preserving of cultural heritage.*

***Rezumat**: Gravura „Sfântul Sebastian", realizată pe hârtie manuală, a prezentat un grad semnificativ de deteriorare din cauza factorilor fizici, foto-chimici, fizico-chimici și biologici, inclusiv fisuri, decolorare și consolidări improprii. Procesul de restaurare a inclus curățarea uscată, îndepărtarea benzilor de hârtie, alinierea fisurilor, consolidarea, presare și integrare cromatică. Aceste operațiuni au restabilit integritatea structurală și continuitatea vizuală a lucrării. Un poster detaliind procesul de restaurare a fost prezentat la expoziția „Magia Restaurării" de la Palatul Brukenthal, evidențiind munca complexă implicată în conservarea patrimoniului cultural.*

***Keywords**: Saint Sebastian, engraving,* anonymous, *conservation, restoration, deterioration, dry cleaning, paper strip removal, consolidation, pressing, Magia Restaurării exhibition.*

***Cuvinte-cheie**: Sfântul Sebastian, gravură, anonym, conservare, restaurare, deteriorare, curățare uscată, îndepărtarea benzilor de hârtie, consolidare, presare, expoziția „Magia Restaurării".*

Description

The engraving represents a traditional depiction of Saint Sebastian, a prominent figure in Christian hagiography and martyrdom. Executed with meticulous detail and employing dramatic contrasts of light and shadow, the composition reflects the stylistic conventions associated with classical and Baroque artistic traditions[1].

Key Features:

[1] Giorgi, Rosa, *Secole de artă: secolul al XVII-lea*, Ed. Rao, (București, 2010), 121, 127.

In the right foreground, Saint Sebastian is shown tied to a tree, a common representation of his martyrdom.[2] His body is partially nude, revealing a muscular figure, and he appears calm and resigned, with his gaze directed upward, symbolizing his faith and acceptance of martyrdom. His pose is dynamic, with one arm stretched upward, tied to a branch, while the other arm hangs lower.

On the left, a group of soldiers and archers are depicted aiming and shooting arrows at Sebastian. Their figures are detailed, with strong musculature and dynamic postures. Some are actively shooting, while others prepare their bows or observe. This highlights the act of martyrdom in progress.

At the top center, a cherub or angel descends from the heavens, surrounded by rays of divine light. The angel carries a palm branch[3] (a symbol of martyrdom and victory over death) and a laurel wreath[4], signifying eternal glory and triumph in heaven. The divine light directed at Sebastian emphasizes his sanctity and the spiritual significance of his sacrifice.

The setting includes a lush tree framing the right side of the scene, with other trees and distant figures in the background. Soldiers and onlookers appear in the middle and background, adding depth and complexity to the composition.

Artistic Style:

The work exhibits fine linear detailing, with hatching and cross-hatching used to create shading and texture[5]. The figures are anatomically detailed, showcasing a mastery of the human form. The dramatic contrasts and emotional intensity are hallmarks of the Baroque style.

This engraving captures the tension between human suffering and divine grace[6], a recurring theme in depictions of *Saint Sebastian*. It invites reflection on faith, sacrifice, and the triumph of spirit over bodily pain.

This 17th-century engraving, based on a painting by Hans von Aachen7, depicts the martyrdom of Saint Sebastian8. Executed by an anonymous engraver, using the burin technique9, the piece showcases intricate line work, characteristic of the period's high-quality engraving methods[10]. The engraving measures 379 x 460 mm, with a paper thickness of 0.3 mm, and was printed on handmade paper[11], known for its durability.

This engraving serves as an example of 17th-century religious art, combining detailed technical execution with symbolic themes, offering insight into the spiritual and artistic practices of the time.

Condition Report

The *Saint Sebastian* engraving (Fig.1, 2) shows significant deterioration due to physical,

[2] Mimbrera, Tomás Miguel Cabrera, 'Saint Sebastian an Iconographic Study: from Painting to film', *UcoArte. Revista de Teoría e Historia del Arte*, 11, pp 223-245 UCOPRESS (Cordoba, 2022), 233, 234.
[3] Impelluso, Lucia, *Natura și simbolurile sale: plante, flori și animale,* Monitorul Oficial, (Bucharest, 2009), 24.
[4] Ibidem, 38.
[5] Salomon, Lorenza, *Saper vedere: La stampa d'aste*, Mandatori electa, (Milano, 2010), 30, 250.
[6] Corbin, Alain, Courtine, Jean-Jacques, Vigarello, Georges, *Istoria Corpului*, Vol. I, ed. Art, (Bucharest, 2008), 19.
7 Turner, Nicholas, Hendrix, Lee and Plazzotta, Carol*, European Drawings 3 Catalogue of the Collection's*, Getty Publications, (Los Angeles, 1997), 152.
8 Hans von Aachen (Cologne 1552-1615, Prague); St. Michaelskirche
9 Graham-Dixon, Andrew, *Arta o istorie ilustrată*, Ed. Litera, (Bucharest, 2019), 27.
[10] Stoicu. Florin, *Tehnici și maniere în gravură*, Polirom (Bucharest, 2010), 86-87.
[11] Schweidler, Max, *The Restoration of Engravings, Drawings, Books, and Other Works on Paper*, Getty Conservation Institute, (Los Angeles, 2014), 39-44.

photochemical, physicochemical, and biological degradation, compromising both its material integrity and aesthetic qualities.

Physical degradation is evident through the presence of fissures, tears (Fig. 3, 4), and inadequately applied reinforcements on the verso (Fig. 5, 6), where adhesive and paper strips were used. These interventions have induced stress within the paper support, and the misalignment of the tear edges has compromised the legibility of the image. Minor losses in the paper substrate and the ink layer are also observed. Embedded dirt and surface grime are evident across the engraving.

Photochemical degradation has occurred due to prolonged exposure to light, resulting in discoloration and weakening of the paper. The handmade paper has yellowed.

The 17th-century engraving of *Saint Sebastian* exhibits signs of chemical degradation, particularly through the presence of stains. These stains have caused discoloration of the paper, altering its original appearance. These stains, which lie within the fiber of the support, contribute to the overall aging and deterioration of the artwork, affecting both its visual integrity and long-term preservation.

Biological degradation is evidenced by the presence of flyspecks (Fig. 7), which suggest insect activity. These organic deposits have contributed to the further deterioration of the artifact's visual integrity, exacerbating its overall degradation.

The engraving is affixed to a handmade paper backing that bears stamps and inscriptions executed in graphite (Fig. 8). In several sections, the engraving has delaminated from its backing, reflecting vulnerabilities that may have been exacerbated by improper storage and prior restoration interventions.

This analysis highlights the urgency for a meticulous conservation approach to stabilize the artifact, mitigate ongoing deterioration, and preserve its historical and artistic significance.

The engraving Saint Sebastian, crafted on handmade paper, has undergone significant deterioration due to age, environmental exposure, and prior inadequate conservation efforts[12].

Conservation Needs

The artwork necessitates dry cleaning to eliminate surface contaminants, stabilization of tears and delamination, and the alignment of tear margins to restore the original structural integrity. Additionally, the reduction of biological contamination is essential to mitigate further deterioration. These interventions are crucial for preserving both the structural integrity and historical significance of the artifact.

Analyses[13]

Spot tests using distilled water and the 50:50 hydroalcoholic solution confirmed these solubility characteristics. These localized tests, performed in inconspicuous areas, ensured the selected cleaning and treatment methods would not harm the paper, media, or adhesives present in the artifact.

The front of the artwork reveals that the black ink used in the drawing is highly resistant to both water and hydroalcoholic solutions, ensuring stability during restoration.

[12] Salomon, Lorenza, *Saper vedere: La stampa d'aste*, Mandatori electa, (Milano, 2010), 331.
[13] Popescu, Georgeta Polixenia, *Buletin de analize* Nr. 2377/ 30.09.2019

The reverse of the artwork bears various inscriptions executed in inks and pencils of differing solubility characteristics.

Two violet ink stamps are water-soluble and slightly soluble in hydroalcoholic solutions, posing a risk of smudging or fading if exposed to moisture. The red ink inventory number is partially soluble in water and more so in hydroalcoholic solutions, requiring careful handling to prevent degradation. A pencil inscription ("inv.354") is insoluble in both water and hydroalcoholic solutions, ensuring its stability, as are additional pencil markings at the top and an ink addition on the top-left margin.

These varying solubility characteristics emphasize the need for precise and sensitive conservation techniques to protect both the artwork and its inscriptions.

Restoration Operations

This series of restoration procedures aims to address various forms of damage while preserving the integrity of the artwork.

The restoration operations performed on the *Saint Sebastian* engraving included dry cleaning, removal of paper strips from the verso (Fig. 9-11), alignment of the tear edges (Fig. 12), consolidation, pressing, and chromatic integration. These interventions were carried out to address the various types of degradation the artwork had experienced and to preserve its visual and structural integrity.

Dry cleaning was the first step, employed to remove superficial soil, dust, grime, and other surface deposits that had accumulated on the engraving over time. This mechanical cleaning technique is essential to eliminate foreign materials that could cause further deterioration of the paper, without using organic solvents. The goal was to reduce the potential for damage while improving the overall appearance of the piece.

The removal of paper strips from the verso was necessary because these strips, which had been applied during a previous restoration, were no longer serving their intended purpose and could compromise the paper's stability. Through the meticulous application of localized moisture and the precise use of scalpels, the strips were carefully detached.

The mending of the tears[14] was carried out to ensure that the design elements and tear edges were properly aligned. This operation involved confirming that the flaps along the tear edges overlapped correctly, which restored the aesthetic and physical unity of the artwork. It also helped to prevent further mechanical stress on the damaged areas. A reinforcing paper strip, consisting of Japanese paper and applied carboxymethylcellulose adhesive, was used as the mending material (Fig. 13-18). Considerations included the weight, strength, and quality of the reinforcing paper, as well as the appropriate width of the strip to ensure stability without compromising the artwork's integrity.

Consolidation was applied to stabilize any areas where the paper or media had become fragile, particularly where the engraving had delaminated or where the paper had weakened. An appropriate adhesive, carboxymethylcellulose, was introduced to secure the loose fragments and prevent further deterioration of the paper fibers.

Pressing was employed to flatten any distortions. This step aimed to remove creases and wrinkles, ensuring that the engraving remained in its original form and reducing the risk of future physical deformation.

[14] Schweidler, Max, *The Restoration of Engravings, Drawings, Books, and Other Works on Paper*, Getty Conservation Institute, (Los Angeles, 2014), 113.

Finally, inpainting was applied to address any areas of loss in the media. This step involved the careful restoration of visual continuity by matching the lost or faded ink with appropriate black pigments from different pencils, blending the mending of the tears seamlessly (Fig 19-21).

Conclusion

After undergoing detailed analysis and restoration, the *Saint Sebastian* engraving revealed significant deterioration due to age, environmental exposure, and prior restoration efforts. The artwork required a sensitive conservation approach, particularly regarding the varying solubility of inks and the fragility of the paper. Dry cleaning, removal of paper strips from the verso, tear alignment, mending with Japanese paper and carboxymethylcellulose adhesive, consolidation, pressing, and inpainting were all carefully performed to restore both its structural integrity and visual continuity.

A poster showcasing the conservation treatment was created and displayed at the *Magia Restaurării* exhibition at the Brukenthal Palace, held from August 3 to October 2, 2022. The exhibition, organized by the museum's restorers, highlighted the complex and collaborative effort behind preserving cultural heritage, providing the public with insights into the science and art of restoration. Through this exhibition, visitors gained a deeper understanding of the meticulous work involved in preserving historical pieces for future generations.

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LIST OF ILLUSTRATIONS

1. Anonymous, *Saint Sebastian*, before restoration, front side.
2. Anonymous, *Saint Sebastian*, before restoration, back side.
3. Misaligned tear.
4. Misaligned tear.
5. Improper mending paper.
6. Improper mending paper.
7. Flyspecks.
8. Graphite inscriptions.
9. Backside after removing of the mending paper.
10. Frontside after removing of the mending paper.
11. After removing of the mending paper, detail.
12. After removing of the mending paper, detail.
13. Before mending of the tear, detail.
14. During mending of the tear, detail.
15. During mending of the tear, detail.
16. Tear after removing the mending paper
17. Tear after mending
18. Tear after removing of
19. Tear after inpainting the surplus Japanese paper
20. Mended tear backside, detail
21. Detail after inpainting
22. Anonymous, *Saint Sebastian*, before restoration, front side.

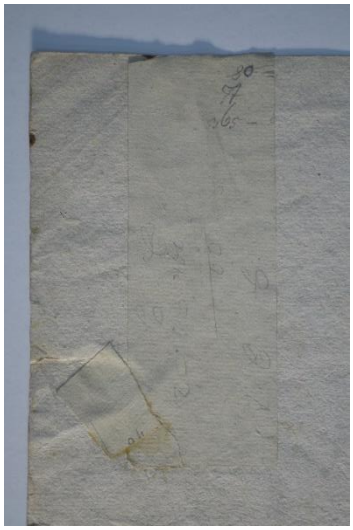
ILLUSTRATIONS


1.

2.

1. Anonymous, *Saint Sebastian*, before restoration, front side.
2. Anonymous, *Saint Sebastian*, before restoration, back side.





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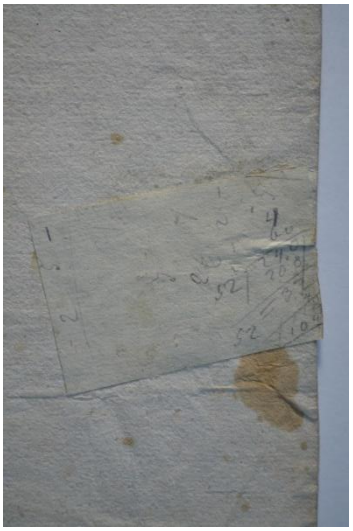
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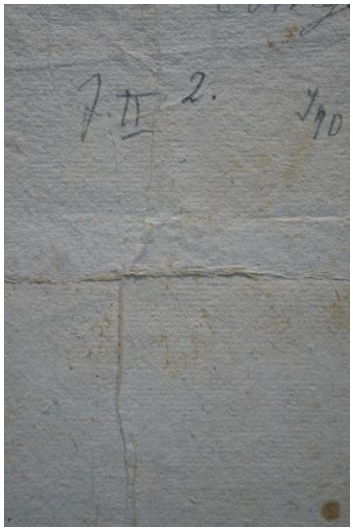
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13. Before mending of the tear, detail.

14. During mending of the tear, detail.

15. During mending of the tear, detail.

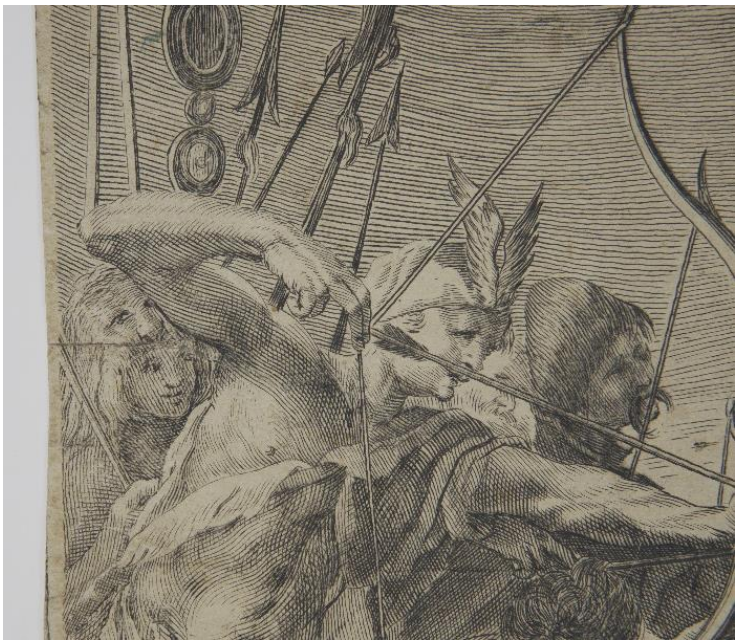
16. Tear after removing the mending paper.

17. Tear after mending.

18. Tear after removing of the surplus Japanese paper.

19. Tear after inpainting.

20. Mended tear backside, detail.



21. Detail after inpainting.

22. Anonymous, *Saint Sebastian*, before restoration, front side.

RESTORATION OF THE GLASS ICON „SAINT NICHOLAS" PAINTED BY THE TĂMAŞ FAMILY

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***Abstract**: The icons painted by the Tămaș family from the Făgăraș County are divided from a compositional and stylistic point of view into three periods according to the generations of painters who worked. If the icons of the first generations are focused on the figurative, spiritual and highlight the religious character of the icon, the works of the last generation of painters of the family will bear the mark of decorativeism that eclipses the holy figures. The restored icon comes from among the works executed by Petru Tămaș-The Son who seems to have mastered the craft quite well from a technical point of view. Unfortunately, an improper conservation of the piece led to major degradations, especially at the level of the colour layer, affecting especially the faces of the characters. The spectacular part of the restoration process of this icon was that, based on the remaining contour traces and areas of colour, the painting could be fully integrated chromatically, even at the level of large gaps, reviving the almost completely lost faces of the characters.*

***Rezumat:** Icoanele pictate de familia Tămaș din Țara Făgărașului se împart din punct de vedere compozițional și stilistic în trei perioade în funcție de generațiile de zugravi care au lucrat. Dacă icoanele primelor generații sunt axate pe figurativ, spiritual și evidențiază caracterul religios al icoanei, lucrările ultimei generații de zugravi ai familiei vor purta semnul decorativismului care pune în umbră personajele sfinte. Icoana restaurată provine din rândul lucrărilor executate de Petru Tămaș-fiul care pare că încă stăpânea destul de bine meșteșugul din punct de vedere tehnic. Din nefericire, o păstrare neconformă a piesei a dus la degradări majore, în special la nivelul stratului de culoare, afectând îndeosebi chipurile personajelor. Partea spectaculoasă a procesului de restaurare a acestei icoane a fost aceea că pe baza zonelor martor de contur și culoare pictura a putut fi integrată cromatic în totalitate, chiar și la nivelul lacunelor de mari dimensiuni, reînviind chipurile aproape complet pierdute ale personajelor.*

***Keywords:** glass icon, Petru Tămaș-The Son, Tămaș family, Făgăraș County, gaps, chromatic integration, decorativeism.*

***Cuvinte-cheie**: icoană pe sticlă, Petru Tămaș-fiul, familia Tămaș, Țara Făgărașului, lacune, integrare cromatică, decorativism.*

Painting of the last members of the Tămaș family. Decorativism, expressiveness, imitation.

Considered by specialists to be a decay of icon painting on glass from Făgăraş County due to

the clumsy line and exuberant ornamentation[1], the icons painted by the last members of the family of Tămaș icon painters are at the same time an archaic breath of rural communities and their beliefs.

Looking at the icons made by the last icon painters of the family, among whom we remember Petru Tămaș-The Son and Ana Tămaș (married Deji), we notice a distance from a painting drawn up by a craftsman trained in painting workshops and from the canons of religious painting. At the same time, the filled appearance of these icons dominated by a lot of ornamental elements transposes us in a specific way into the cradle of creation of these icons, the house and household with their own environment.

If the icons of Moise Tămaș or of Petru Tămaș-The Father were dominated by the canonical aura of the mural painting in which the figure dominates the background, those of the descendants of the last generations will be penetrated by an accentuated decoration in which the fields will put the figures of the saints in the background through the numerous ornamental details. In the icons of the first two mentioned painters, the slender figures are projected on simple, sober backgrounds, in a sumptuous posture (if we think, for example, of the Mother of God with the Child on the Throne or a Deisis scene), the rich decoration being reserved only for the borders. On the other hand, the icons of Petru Tămaș-The Son and Ana Deji surprise with the multitude of elements as landscape (fields, stars), plants (leaves, flowers) and geometric forms (semicircles, wavy lines), brightly coloured (at Petru Tămaș-The Son) or in dark tonal colours (at Ana Deji), accentuated by touches of white that make the whole composition to vibrate.

These decorative elements remind us of what Lucian Blaga said about the ornamentation present in traditional art with „*free forms*", „*through its linear inventions, through the rhythm and through the colours used* [...] *viewed as a direct expression, as a confession and communication of a spirit*"[2]. In this case, the icons of Petru Tămaș-fiul and Ana Deji must be viewed from the perspective of the context in which they were conceived.

On the one hand, coming from the current of peasant iconographers, who did not have all the compositional knowledge of iconography enjoyed by those who were also among the mural painters, means that the figures or scenes represented are not exactly proportional or consistent with iconographic rules, uneducated iconographers relying especially on popular legends or books of a religious nature where the lives of saints and various parables are remembered[3].

On the other hand, the symbols and colours of the objects used in the peasant household, especially textiles, give a code of a universe in which the material world merges with the spiritual. Thus, the decorative elements present in large numbers in these icons can to some extent overshadow the spiritual character of the characters enveloped by stars, flowers, lines and dots, the viewer's eye being impressed primarily by these ornaments and only then reaching the expressed state of the figure of the saint (which somewhat balances the perception by the large unmodulated white spot of the face and the piercing black eyes).

At the same time, taking into account another reflection by which Lucian Blaga tells us that the ornamentation is the „*repository of collective secrets*" from whose elements we can „*reconstruct somewhat ‹‹graphologically›› the spirit of a population*", a flow of elements of which „*creating ornamental forms, man thinks he is indulging in a simple game*", but „*in reality this game means self-betrayal, confession, utterance, involuntary manifestation, of a secret substance*" in which there is „*a mysterious correspondence of configurations: on the one hand the human soul, on the other the*

[1]Băjenaru Elena, *Icoane și iconari din Țara Făgărașului*, (București 2012), 153.
[2]Blaga Lucian, *Opere*, vol. 9, (București 1985), 276.
[3]Băjenaru Elena, *Icoane și iconari din Țara Făgărașului*, (București 2012), 35, 39, 44-45.

ornamental invention"[4], we can associate the presence of these decorative elements and the working technique in the icons of Petru Tămaș-The Son and Ana Deji as a reflection of influences coming both from the outside (through contact with traditional ornamentation) and from the inside (as a way of relating to the icon which they executed).

From the point of view of external influences, we recognize stars (frequently found in mural painting), highly stylized plant elements that try to reproduce some plants with a certain meaning (palmettes, haulms, quadrilobate flowers), various geometric motifs (especially superimposed semicircles), adjacent strips composed of wavy lines, elements also present on textiles or traditional clothing.

From the point of view of influences coming from within, we can see how these elements are used. We certainly cannot penetrate into the soul of the painter to know really what he wanted to express, but the way in which he draws the lines, as well as the arrangement of the ornamental details, inclines us to suppose that they were not used merely for fill the space of the glass with large dimensions, as mentioned by certain researchers in the field[5], they could reflect a certain state of mind and a summing of the defining symbols for a painter who partially detaches himself from the religious character of the icon and approaches a traditional work of art resembling a table cloth or a plate richly decorated with phytomorphic or zoomorphic elements that convey a certain message through the symbol. But, as Elena Băjenaru also says, the difference in perception and the saving of these icons from the category of simple decorative images is the reverence brought by the viewer towards the people represented[6], a trait that we also consider influenced through the inner, immaterial state of that „spirit" mirrored by the material elements.

Following the analysis, we note that the icons executed by Petru Tămaș-The Son and his sister Ana, although they stereotypically imitate the icons used by their parents modified to other dimensions according to the requirements[7], are permeated by this decorative breath that, depending on how we look at the works, enriches or impoverishes them. From a religious point of view, the icons become simple copies of the previous icons, whose outline lines (essential elements for conveying a certain message in such a work) no longer have the expressive load of the first icons executed by the Tămaș family, and from from the point of view of the ornamentation, the works have a dynamic aspect, being oriented more towards the decorative, but, probably, with an intrinsic justification for the use of these elements that dominate the entire composition.

Restoration of the icon „Saint Nicholas"

The icon presented in this case study represents an image of Saint Nicholas with a double meaning. On the one hand, the appearance of the clothing gives us an image of him after he received the position of hierarch, and on the other hand, the characters painted next to the saint remind us of the miracles he performed during his life, being known as a benefactor for the people[8].

The composition is developed on several planes marked by architectural, vegetal and cosmic elements. The farthest plane is rendered by a blue background where are painted white and red stars (characteristic elements of the icons painted by the painters from the Tămas family). In the immediately following plans, similar to the compositional plans of a medieval miniature, four

[4]Blaga Lucian, *Opere*, vol. 9, (București 1985), 276.
[5]Băjenaru Elena, *Icoane și iconari din Țara Făgărașului*, (București 2012), 153.
[6]Ibid. 154.
[7]Ibid. 153.
[8]Olteanu Antoaneta, *Calendarele poporului român*, (București 2009), 377-379.

characters arranged in architectural frames flank the figure of Saint Nicholas. In the lower part of the image, a landscape element (three hills) gives depth to the two-dimensional composition, marking the distance between the saint and the people behind him.

On the left side, on the upper level of a two-story house, are painted the torsos of three young female figures with long flowing hair and long, green and red robes with collar at the base of the neck. The three girls look at the saint with joy, each holding a yellow bag. Holding the bag, the girl on the right appears to salute with her left hand in thanks for the gift.

On the right, standing as if in a tower or coming in a soul from a house behind him, a middle-aged man seems to want to say something to the saint in front. He is painted with long hair, a short round beard, dressed in a long green robe covered by another red robe. In his left hand he holds a yellow bag, and his right hand holds it open, facing Saint Nicholas.

From what has been mentioned so far, surely those initiated into the mysteries of Christian iconography and especially those who have studied the life of Saint Hierarch Nicholas recognized the representation of the miracle by which the honor of the poor father and his three daughters was saved by the bags of gold thrown at night by the saint on the window of the house[9].

In addition to the dynamic representation of this wonder reflected in this composition in vivid tones, one particular element catches our attention. The head of the male figure on the right side of the image is framed by a halo like saints. This aspect can be clearly clarified to the extent that the source from which the painter was inspired or the drawing from which he worked.[10] To clarify this particularity, we will once again refer to the miracles that happened in the life of Saint Nicholas who tell us that before his investiture as a hierarch and after he slapped Arius at the Ecumenical Synod of Nicaea, the Mother of God appeared to him carrying the omophorus in his arms and Jesus Christ giving him the Gospel[11]. Thus, in the icons where he is not painted in the context of a miracle performed by him, but only as a hierarch, on the throne or standing, to his right and left are painted Jesus Christ (right of the saint) and the Virgin Mary (left of the saint) under the guise described. Considering the fact that the icons on the glass are painted on the back and when we turn the glass the elements appear in the mirror, we can assume that was used a model where the saint was represented with the two figures side by side and was modified for the this theme. But the image of the saint is not represented in the mirror, which makes us give up this assumption. Another hypothesis that we can bring into discussion would be that the painter would have consciously painted the male character as Jesus Christ who rewards in turn Saint Nicholas for the miracle performed, but this assumption is also nullified by the simple fact that, usually, Jesus Christ or the Virgin Mary is represented in such cases in torso[12] or on clouds, holding the Gospel and the omophorus or raising their hands in glory. Finally, a third hypothesis, which we consider plausible, would be that the figure is the father of the girls, but the halo was added either because the painter was influenced by the previously mentioned iconographic composition, because the old father gave up to send his daughters to debauchery or

[9]A rich man was forced by certain circumstances to give away his wealth. Being at an advanced age he could no longer work and in order to earn a penny to support the family he decided to send his three little girls to debauchery. Saint Nicholas, hearing of this deed, went at night and threw a bag of money at the window of the house where they lived. The old man was amazed when he saw the gift in the bag and ran to see the person who threw the money and thank him for the favors. This miracle portrayed Saint Nicholas as a benefactor and protector of families and young girls who want to get married.
***, *Viețile sfinților*, 1993, 68-69.
[10]If it existed.
[11]***,*Viețile sfinților*, 1993, 73.
[12]Which in this case is not excluded from the point of view of size and appearance.

because he returned to faith and, according to legend, became a monk after marrying his three daughters and served the saint until the end of his life[13].

Saint Nicholas is painted in the central part of the composition in hierarch's robes. The face framed by the halo is white with some brown highlights in the area of the eyebrows, chin and moustache. The beard is round and divided into two parts. Beneath the miter he wears, long brown hair can be seen reaching his shoulders. The features give us a face dominated by serenity and gentleness. The red miter, insignia of the hierarch's rank, has simple decorations. Its base is formed by a yellow band with orange edges. Inside this band a sinuous line with orange spots imites a vegetable decoration. Green leaf-shaped ornaments with rounded lobes are painted above the base. The miter is divided in half by a plain yellow band with orange spots and yellow edges. On the sides of this strip are painted two green circles with a red center, like eyes. Red and green ornamental details are illuminated by white lines that accentuate the vibrancy of the present chromatic contrast. Small semi-circular yellow ornaments with orange spots are painted around the entire miter, facing outwards, similar to those in the border area. An interesting fact found during the iconographic analysis of the image is the lack of the cross at the top of the episcopal miter, usually found in other icons. We assume that the omission of this detail is the result of the reduced space between the miter and the ornamental elements of the border, which would have as a result the painting of an element disproportionate to the piece of clothing to which it belongs. Another special aspect that gives a chromatic play to the composition is the colour of the clothes. The surplice is pink underside and the sleeves are green finished with the sleeves painted in yellow and decorated with the ornamental motifs present at the base of the mitre. Above this garment is the red sackcloth with blue inner lining and a rich hem formed by an ornamental band similar to that of the sleeves, doubled by two rows of semi-circular ornaments coloured yellow and green with orange ornamental touches. Even if the epigonate and crutch are missing from the episcopal costume in this case, we have another defining element for this status, the omophorus. This garment is painted green with yellow trim. Descending from the shoulders, twisted in the chest area, the longer part passes over the middle area of the figure where the epitrachilus should also have been painted. On the green background is painted a plenty of white and black stars interspersed with red spots. The three crosses in the area of the shoulders and abdomen, usually present on the omophorus, are replaced in this case by three yellow quadrilobate flowers with an elongated lobe. The right hand of St. Nicholas is raised to the level of the chest as a sign of blessing and on the left side we have painted a Gospel which he holds with the other hand.

Nor was the book neglected from the point of view of ornamentation, the painter giving the worshiper or simple spectator the importance it has. Following the composition of the cover, we identify on the rosy background with red dots a central, red, almond-shaped medallion with three lines that are arranged in such a way as to remind us of an iconographic composition[14]. It is framed by four semi-circular ornaments painted at the corners[15] in red with white and black lines. The edges are yellow with wavy black lines and shades of black and orange (as seen on the hem decoration) imitating plant motifs. The bottom and at the top margins of the book are each doubled by a plain yellow band by which the iconographer probably wanted to reproduce the thickness of the book.

[13]Olteanu Antoaneta, *Calendarele poporului român*, (București 2009), 379.

[14]Two large lines forming a vault and a smaller line at lower right. We assume that the painter would have thought of the scene of the Savior's Descent into Hell, frequent on the metal covers of the old Gospels. The two large lines may constitute the delimitation of the mandorla of light in which Christ was enveloped when he descended into Hell and the small line at the lower right, delimiting a small fragment, may be the resurrected Adam or even those who were in Hell and were saved by the Resurrection of Jesus.

[15]Also at the metal covers of the Gospels, the central medallion is framed by the figures of the four evangelists, authors of the writings that compose these books. Also in this case, we assume that the intention was to represent these elements of the iconography of the metallic clothing that covered these books.

In this chromatically vibrant and richly ornamented image, the neat and safe line still predominates in defining the character's gestures and clothes through which the painter shows us the status that Saint Nicholas had, but above all his qualities as a guide and benefactor of the people he had conducted or helped in various needs. He is depicted with a serene face and a slightly smiling mouth, waiting at any moment to be helpful and protective in our needs. Related to the composition of which he is a part, the person of Saint Nicholas tells us that anyone who had faith was helped and offers us support not to lose hope no matter how constrained we are by circumstances.

The entire composition is framed by a border that we can associate with a threshold through which we look to another world. Perhaps for this reason, the colours consists of three tones. This difference of three representation modes can also be seen in the way the whole border is designed. On the outside, next to the wooden frame, the first register is red, consisting of two wide bands that seem to wave. If in the portion next to the fold of the frame, the segments that make up the band represented on each of them two white lines and two black lines painted inclined and alternated, on the red band that follows them, in the first register, four white lines are painted on top of each other like bars that give it quite intense movement. In the second register, consisting of a strip with the right outer edge painted in blue as a starry background behind the characters, we again encounter that alternation of black and white lines, but this time oriented in the opposite direction to those in the red register, which takes us with the thought of a change. Finally, like the flowers that adorn a precious icon on the occasion of celebrating the saint or the moment depicted in it, is painted a register consisting of semi-circular ornaments arranged in two rows. The first has blue elements inside and outside, the border with orange ornamental stripe, and the second is composed of yellow elements, with stylized floral elements in the form of three orange lines branching from the meeting points of the elements in the row below. Taking into account the painted wonder and the legend behind this icon, we can associate the three registers and their arrangement with the three states that the painted characters in this image went through: the border in red waves and the dynamics of the lines in it, the tumult, earthly life and the temptations or sacrifices to which we are subject or willing to make; the clear blue with the reoriented initial lines, the divine help, the hope obtained through it in moments of great difficulty and the return to faith; the yellow flowers, the divine grace that we bring to fruition through a decent life and that springs from the faith we show, the flowers being dedicated to the holy figure, orienting us to him, thus serving us as a model of virtue and intercessor for God who pours out His grace and gifts on us at the right time.

From a technical point of view, the icon is composed of a wooden frame, painted glass on the back and a lid, with total dimensions of 51x56 cm. The frame is simple, slightly chamfered on the inside, composed of four softwood sticks joined at 45 degrees with wooden wedges. On the front, it shows a decoration made in the fladdern technique that imitates veneer, a dark brown background with smooth lines made with a brush[16]. The middle area of the upper stick is pierced by the hook hanging system. The softwood lid is made of four boards of reduced thickness (approximately 5 mm), cut with the hatchet, fixed to the frame with the help of metal nails. The glass is a handmade glass, highlighted by its smooth appearance, reduced thickness, visible lines in the internal structure and on the surface in radiant light, as well as air bubbles from the production process. The painting is made in the tempera technique with egg emulsion, it has a naive appearance, but with a high expressiveness given by the well-controlled line, decorative touches and well-harmonized colours. Considering these technical characteristics, we assume that the icon would date from the second half of the 19th century, the author being Petru Tămaș-The Son, one of the last members of the Tămaș family of painters from

[16]The lines are slightly raised on the background, which makes us admit that they were made with a brush and not with a comb.

Făgăraș County.

The state of preservation of the icon at the entrance to the laboratory was medium to advanced degradation. The frame and the lid showed slight structural changes caused by fluctuations in humidity and temperature, but also by the cutting of elements during their manufacture. We mention curvatures of the frame sticks and distances in the area of the joint angles of the sticks. Also, in the lower area of the lid planks and the bottom stick, the loss of the wood support could be observed. After opening the lid, a small attack of fungus was found on the inside in the form of white iridescence as well as traces of red colour following the outer shape of the border which gave us the information that the colour layer in that area was not completely dry at the time of installation of the tiles. Also, the outer surfaces of the frame and lid showed dirt with poor adhesion and a greasy character, and on the rabbet of the frame and the back of the lid, dust deposits, cobwebs, insect pupae, small dead insects, sawdust marks as well as scales of colour from peeling painting and mechanical shocks. The most affected part was the colour layer which showed exfoliation, fragility, a very large number of small gaps on the entire surface of the painting and major gaps in the area of the saint's faces and hands. Following visual observations of the colour layer during the stage of prophylactic consolidation of areas with increased sensitivity, it was observed that the binder in the composition was either weak (as in the yellow area in the halos and ornaments) or was affected by fluctuations microclimate that led to the fragility of the colour layer, its exfoliation and the resulting losses.

Given the complexity of the icon's problem, microscopic observations were made before the restoration operations began to identify the contour traces left in the gaps of the colour layer. After identifying of these, they were marked on the face of the glass with a temporary marker to reconstruct the image in the chromatic integration step.

The first step in the technological flow consisted of opening the lid by extracting the metal nails with the help of pliers and a metal spatula to protect the wooden support.

In order to be able to strengthen the colour layer that showed separations or fragility, after the step of opening the lid, a removal of large deposits of dirt, dust and insect pupae was carried out with the help of soft brushes and tweezers both on the entire surface of the icon, as well as in the lacunar area with the help of small brushes, slightly moistened in water. The strengthening of fragile areas and of exfoliated colour flakes was carried out by an emulsion of egg yolk and water in a ratio of 1:2 (1 part yolk : 2 parts water) applicated local with a brush.

The local consolidation step was followed by the extraction of the glass from the frame and the restoration of the painting. The first operation was a total removal of the remaining loose deposits of dust and dirt and then a final consolidation of the colour layer with egg emulsion in the ratio 1:1 (1 part yolk: 1 part water) also intended to nourish this layer. In the areas with exfoliation or fragility, a light pressing with the help of a cotton swab was done over the non-stick film (Melinex) to fix and bring the colour layer to level. After consolidation, the adherent dirt was cleaned with an emulsion of egg and water in the ratio 1:3 (1 part yolk: 3 parts water) using small cotton pads.

The last stage of the restoration of the painting was the imitative chromatic integration of the layer gaps with the help of watercolours after cleaning and degreasing them with isopropyl alcohol.

Regarding the frame and cover, were carried out cleaning operations of the wooden support and structural strengthening. The frame was taken apart, dry cleaned on the back with steel wool and wet cleaned with a solution of water, ethyl alcohol and ammonia (90% water, 10% ethyl alcohol and 10 drops of ammonia) after which it was reglued with the original wedges and a fish glue solution of 25% concentration to restore its stability and avoid the moving of the sticks that it has acquired over time as a result of structural changes in the wood. Given the fact that the frame presented in some

areas a xylophage attack (inactive at the time of the restoration operations) and resulted in a medium-level degradation of the wooden support, in these areas was injected a solution of Paraloid B72 resin dissolved in acetate ethyl, 10% concentration. In the lacunar area of the lower stick, for aesthetic reasons, was made a filling with sawdust putty and fish glue of 5% concentration. On three-quarters of the surface of the frame fold, thin sticks of balsa wood were glued to ensure a stability of the glass when the icon is placed in the frame. The gluing was done with a 15% fish glue solution and the chromatic integration was done with water-based wood stain. The fungal attack on the back of the lid was removed with a scalpel and then the lid planks were cleaned with steel wool on both sides, preserving the traces of colour from the inside. The area of the fungal attack was cleaned with ethyl alcohol using cotton swabs. The outer face of the planks was lightly cleaned with a solution of water, alcohol and ammonia of a similar concentration to that used to clean the frame sticks. The filling of the support gaps at the bottom of the planks was made with balsa wood and sawdust putty with rabbit glue. A 25% concentration glue solution was used for gluing the additions and a 5-7% concentration glue solution for the putty. The chromatic integration of the additions was made with tempera colours.

After carrying out the restoration operations on each element, the icon was re-placed in the frame and the cover was mounted. After placing the icon in the frame, small pieces of felt were mounted in the area between the glass and the frame rabbet, as well as in the area between the glass and the lid, which prevent the glass from moving inside the frame and its contact with the the reverse side of the lid. The glueing of these pieces of material was done with a thermoplastic silicone applied using a glue gun. The fixing of the cover planks was done with small wood screws applied by screwing. Given that the ends of the marginal planks had their fixing points approximately in the vicinity of the frame rabbet, in order to avoid the contact of the wood screws with the edge of the glass, the two planks were moved closer to the edges of the frame and in the areas left free were made from poplar wood two new planks approximately equal to the dimensions of the original planks. They were chromatically integrated in tempera colours and fixed with wood screws. Thus, the glass was protected by avoiding mechanical contact in the frame rabbet, which, at the same time, did not allow a proper fixation.

Conclusions

The in-depth study of the icons on the glass always gives us details that arouse the interest of a research on them. Whether we are talking about technical details, whether we are talking about certain iconographic or iconological aspects, even a simple ornament or the arrangement in a certain way of the decorative elements of a border can lead us to hypotheses that could have been the basis of the conception of that icon.

We thus discover a world that we no longer fully encounter nowadays and that we can no longer fully perceive in the same way as the people of the past. Even though at the time icons like the one presented in this case study were treated as aesthetically inferior, time and changes in society have made them included in this material heritage that testifies in its own way to the beliefs and conceptions of a world where the man born in the rural area were guided by the inner spirit and the morality and spirituality inherited in the family or chiselled by certain legends or parables with which he got in touch.

Also, a restoration work such as the present proves once again the need for continuous training and the acquisition of the necessary skills, both technical and ethical, that a good restorer must fulfil in order to know how to make decisions favourable for the preservation of material

integrity and spiritual aspects of the object that it undertakes to recover in such a way as to ensure a stable state of preservation in order to perpetuate the values and the message transmitted by it.

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LIST OF ILLUSTRATIONS

1. Front and back icon before restoration.
2. Lid details before restoration.
3. Details of the icon before restoration.
4. Details of the icon before restoration.
5. Overview of the opened icon.
6. Opening the frame and the lid.
7. Frame and lid cleaning interventions.
8. Dry cleaning interventions on the painting.
9. Prophylactic consolidation of the painting.
10. Overview of the icon after cleaning and final consolidation
11. Overview of the front icon before and after restoration.
12. Overview of the back icon before and after restoration.

ILLUSTRATIONS

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7. Frame and lid cleaning interventions.

8. Dry cleaning interventions on the painting.

9. Prophylactic consolidation of the painting.

10. Overview of the icon after cleaning and final consolidation

11. Overview of the front icon before and after restoration.

12. Overview of the back icon before and after restoration.

RESTORATION OF THE WORK "LANDSCAPE FROM BAIA MARE" BY HERMANN MORRES

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***Abstract**: The work "Landscape from Baia Mare" by painter Hermann Morres from Braşov is an acquisition of particular documentary importance for the patrimony of The Braşov Art Museum. The article aims to scientifically valorize the restoration documentation regarding information on the type and sequence of methodological stages of oil painting restoration on textile support, in order to adopt modern standards in the Restoration Laboratory of the Braşov Art Museum.*

***Rezumat:** Lucrarea „Peisaj din Baia Mare" a pictorului braşovean Hermann Morres, este o achiziţie de o importanţă documentară deosebită, realizată de Muzeul de Artă Braşov în anul 2016. Articolul urmăreşte valorificarea ştiinţifică a documentaţiei de restaurare, a informaţiilor ce ţin de tipul şi succesiunea etapelor metodologice ale restaurării picturii în ulei pe suport textil, în scopul adoptării unor standarde moderne de restaurare în cadrul activităţii laboratorului de restaurare al Muzeului de Artă Braşov.*

Keywords: *restoration, oil painting, textile picture supports, the picture layer, separation of the picture layers, flaking.*

***Cuvinte-cheie**: restaurare, pictură în ulei, suport pictural textil, stratul pictural, separări ale stratului pictural, exfolieri.*

Hermann Morres - a short biography

Hermann Morres (1885-1971) was born in Braşov and studied in Budapest with Székely Bertalan and Révész Imre. He was a drawing teacher at the German School for Girls in Braşov (1908-1948). Hermann Morres worked in the artistic milieu of Braşov for over six decades, becoming one of its most important representatives in the 20th century. His creation evolved from naturalism (realism) to post-impressionism, but also experienced the moderate influence of expressionism. He favoured landscaping, frequently resorting to watercolour.

Hermann Morres' work gravitated towards the post-impressionist influence. The artist described his artistic development in 1930 as follows: "I come from naturalism. At first, copying nature in its various forms without any particular contribution of my own was enough for me. Later I associated myself with a moderate impressionism, in which the emphasis was still on the 'outdoor atmosphere' and the rendering, albeit more ephemeral, of natural lightness and tonal values. The fact that I did not follow it to the last consequence of abandoning form is due perhaps to my musical sense of form."

Extremely active in the interwar period in Braşov, Hermann Morres was primarily a landscape painter, approaching nature as the main subject of his works, both in oil and watercolour. During the 1920s, in the landscapes painted in Braşov and in the series of landscapes from Bramante, he developed his own style characterised by the rhythmic structuring of shapes and colours, the simplification of forms, a decorative colouring and the construction of space.

In the catalogue of the 1970 retrospective exhibition, the artist spoke about the influence that music had on his creation: "I created my most beautiful works when I discovered that fine art can also mean RYTHM, as well as poetry and music, and I have always worked towards this in my work." Hermann Morres mentions among the characteristics of his pictorial method: the tendency towards monumentality", "the broad, stylized treatment of large surfaces of forms", "the subtle harmonization of coloured surfaces, their accentuated delineation by appropriate contours", resulting in "an amplification of natural forms, a heightened expressive force" and "the vibrant rhythm of forms". Summing up the goal of his painting, the artist states that "The painting is a surface - even if it seems to have the dimension of depth - and it must be conceived, constructed starting from this surface by means of surface expression such as lines, chromatic forms that intersect, intertwine, combine, support and condition each other harmoniously and rhythmically. Yet with me this does not happen with abstract, cubic forms, but the forms of nature are integrated in a totally concrete, stylized way...".

After 1930, Hermann Morres turned to themes reminiscent of "new classicism" painting. He painted a series of monumental works with mythological and biblical subjects (Danaides, The Apple of Paris and Adam and Eve). Also dating from these years are compositions of feminine nudes in landscape, reflecting his conviction that "the nude man is timeless, it is practically the man himself". This trend away from a strict naturalism continues in later years. In 1934 he produced "The Four Seasons" cycle, in which one can see the formal reception of expressionist elements.

In 1918, the artist had written a diatribe against expressionism, but later he is re-evaluating his opinion, arguing for an integration of the spiritual element in painting: "Today, simple reproductions are no longer demanded, but only individual remodelling depiction of the representation from nature, intensification of the living world, if not total abstraction. I haven't gone that far yet, but who knows, if my path will take me to that point." However, despite these judgements, he would not turn to abstract painting, on another occasion stating decisively, "Nature must always be the mother ground of painting."

Even if he explores new paths in oil painting, the artist does not give up naturalism in the watercolours of this period, faithfully evoking his native lands. In the landscapes dedicated to his home town, Hermann Morres often resorts to a similar cut-out and compositional structure, contrasting the idyllic nature in the foreground with the cityscape dominated by the fortress walls and the massive silhouette of the Black Church looming in the distance.[1]

The description of the painting

Hermann Morres was one of the few artists in Braşov who frequented the artistic colony of Baia Mare during the interwar period. This painting powerfully evokes The Baia Mare Painting School's characteristics and the unique features of local geography. It is an exceptional artistic achievement, a peak in Hermann Morres's creation. The characteristics of his painting - the rhythmic arrangement of shapes and colours, the simplicity of forms, the decorative colouring and the rigorous structuring.[2]

The work "Landscape of Baia Mare" (Foto. 1, 2) by painter Hermann Morres, from Braşov, is an acquisition of great documentary importance, made by the Braşov Art Museum in 2016 from engineer Doru Neguț, famous teacher of the Andrei Saguna High School in Braşov, a great lover and collector of art and an impressive connoisseur.

[1] Radu Popica, *Arta braşoveană interbelică* (Braşov: Editura Muzeului de Artă Braşov, 2016), 32-33.
[2] Radu Popica, *Braşov – 6 Secole de pictură în 28 de capodopere (sec. XV-XX) / Braşov – 6 Centuries of Painting in 28 Masterpieces (XV-XXth. C.)* (Braşov: Editura Muzeului de Artă Braşov, 2020), 44.

The restored work is currently part of the Permanent Exhibition of the Braşov Art Museum.

Remarks on the work's state of preservation

The wedged stretching frame (Foto. 3) is made of Fir wood, with retracting slope, tongue-and-groove joints with tensioning wedges. It showed adherent, clogged dirt, paint splashes (Foto. 4), mechanical wear, dents, nail holes. The size of the stretcher bars is 4.4 cm wide x 1.7 cm deep.

The canvas (warp 15 / weft 17) is of fine-grained industrial craftsmanship (Foto. 5); it was oxidized, and showed slight deformation, tensional deformation in the cloth structure, unravelled string edges, knots, adhering dirt, impregnations of the preparation layer and haloes of blue paint, in the background. The upper edge of the chassis was missing 3 anchoring nails (Foto. 6); the existing nails were oxidized.

The primer was adherent, applied in a relatively thin layer by brushing; it penetrated the canvas towards the back. The colour layer has alternating impasto (Foto. 7) – both thin and coarse, with a network of cracks and migration creases (Foto. 8, 9), redness, scratches and gaps. The painted surface was covered with adhering/anchored dirt (Foto. 10), splashes of dirt, insect droppings (Foto. 11). The painting did not have a protective varnish over the picture layer.

The paint layer's stability between the ground and the paint is affected not only by its own physical and chemical composition, but also by changes in the adjacent layers. If the ground cracks, the paint layer will also suffer over time.[3]

In regard to Hermann Morres's work, the most significant damage was the tendency of layer separation and isolated loss of paint layer (Foto. 12). The separation of layers in textile painting is mainly limited to individual paint flakes. In most cases, the separation of the layers takes the form of 'lifting'. In the case of textile-backed paintings, the stresses on the painting layer caused by climatic effects are particularly significant, as there can be a direct exchange of moisture between the front and back of the painting. In addition, each layer of an old painting on a textile support will show a greater or lesser degree of age-related cracking. The exchange of moisture between the front and back of the painting occurs mainly through these cracks. Any change in the relative humidity of the air will cause moisture exchange through the cracks. As the entire cross section of the paint layer is subject to this moisture diffusion in the area of the ageing crack, this water can accumulate between the paint layer and/or the substrate. This can lead to surface tensions, lifting and separation of the layers.[4]

Water can accumulate in the micropores of the imaging layer by both capillary condensation and osmotic processes. The swelling of an image layer depends on its properties, its thickness, the length of time it has been exposed to water and its temperature. During swelling, the polymer molecules of the image layer absorb moisture uniformly.[5]

The case study. Methodology

The process of restoration initiated with a gentle dusting of the work with a soft brush and simultaneous low-pressure vacuuming (Foto. 13) then followed by the reinforcement of areas with loss of paint layer by applying a 'facing' of Japanese paper and a solution of distilled water and sturgeon glue, 7% in concentration (Foto. 14). For some areas with fine-crazed thicker impasto, the consolidant was applied directly, by using a thin brush (Foto. 15). The removal of the oxidized nails anchoring the canvas to the stretcher was done with care, in order to prevent any damage to the edges of the textile support (Foto. 16).

[3] International Council of Museums, *Manual on the Conservation of Paintings* (Dorset: Archetype Publications,1997), 145.
[4] Knut Nicolaus, *The Restoration of Paintings* (Cologne: Konemann Verlagsgesellschaft GmbH, 1999), 194.
[5] Nicolaus, *The Restoration of Paintings*, 196.

After removal of the canvas from its stretcher, the back dirt was vacuumed (Foto. 17); it became apparent that a substantial 'dirt pocket' has built up behind the bottom bar. Dust and dirt on the back of paintings act as a compress, accelerating the deterioration of the canvas.

For thorough dirt removal, a dry cleanup followed, done with a 'Wishab' dry cleaning sponge (Foto. 18, 19). These soft dry cleaning pads are used on paintings, murals, frescoes, paper and other surfaces. They easily and effectively remove dust, soot and other common soils from surfaces. The sponge is rubbed onto the soiled area and then removed with a brush or vacuum cleaner. The sponge surface is constantly re-covered as the crumbs on the pad break off and take the dirt with them, providing a cleaning action that doesn't leave streaks, stains or smudges. Surfaces to be cleaned must be completely dry. It leaves no residue. The dry cleaning pad consists of a blue handling body onto which an orange active layer is poured. In this instance the orange side of the sponge was used because it was designed for cleaning painted surfaces.[6]

When the canvas was removed from the stretcher, it was found that the preparation layer - the primer - had penetrated the canvas interstices and the accumulated residue had transferred and hardened on the top side bar and one mullion of the stretcher (Foto. 20), effectively bonding the canvas to the chassis. To remove the residues, mechanical cleaning was carried out, using abrasive paper and additional cleaning was done with ethanol.

The next step was the removal of loose threads, which was carried out using tweezers and scissors (Foto. 21). This was done both for aesthetic reasons and to avoid further unraveling of the canvas edges. The canvas was then restretched and anchored wit stainless steel nails.

Further on, cleaning tests followed (Foto. 22, 23). Because initial cleaning tests revealed a thin, dark-yellowish layer of polymerised oil beneath the layer of dirt, the cleaning was carried out in two stages: 1). The removal of the anchored dirt, done with a solution of both ammonium hydroxide (5%) and distilled water (95%); 2) The removal of the thin, darkened, polymerised oil layer with a solution of acetone (50%) and white spirit (50%).

Thereafter 'filling' was carried out into the deffective areas (Foto. 24, 25), consisting of sturgeon glue (10%) and chalk filling putty. After drying, the excess was removed then the glue filler was leveled and structured (Foto. 26). By 'structuring' it must be understood that the structure of the original painting's surface is recreated in or on the filler.[7]

After filling and structuring, the retouching was applied with gouache paints (Foto. 27, 28). Gouache retouching allows to imitate not only the colour and shape, but also the texture of the paint layers.[8] A synthetic retouching varnish (containing cyclohexanone and white spirit) was then brushed out for reviving sunken-in (matt) areas, and for providing temporary protection of the painting (Foto. 29). The final retouching was then completed with mastic resin based restoration paints (Foto. 30).

A final varnishing was done with an aerosol synthetic resin (a solution of acrylic resin in white spirit and turpentine oil), to ensure durable protection.

The protective film must have plasticity qualities, i.e. it must be able to deform, if necessary, without then tending to return to the conditions prior to deformation. It is obvious that these are conflicting needs to which a single paint can hardly adapt. It is therefore necessary, on a case-by-case basis, to identify which need predominates and this, in the current situation, is not an easy solution. In this respect, a thorough knowledge of the chemical and physical characteristics of the binders that make up paints is very useful.[9] The reversibility of the protective layer is also paramount, therefore this type of resin was chosen thanks to the unchallenging removal of the resin coats with white spirit or turpentine.

According to the applicable law, among other regulations, the following operations must be carried out when a cultural good enters the patrimony of a public institution: the object must be assigned

[6] Archival Survival, Copyright © 2024, https://www.archivalsurvival.com.au/collections/wishab-sponges.
[7] Nicolaus, *The Restoration of Paintings*, 244.
[8] Nicolaus, *The Restoration of Paintings*, 278.
[9] Vincenzo, Massa and Giovanna C., Scicolone, *Le vernici per il restauro I leganti* (Firenze: Nardini Editore, 2004), 41.

an appropriate inventory number; the inventory number has to be marked on the object.[10] Therefore the inscription was done by using an institutional approved format stencil and resin based restoration paint (Foto. 31).

Finally, the edges of the work were protected with a fabric strip and the painting was framed (Foto. 32, 33), and anchored with stainless steel fixing plates. The frame was fitted a two-point anchoring system.

Once placed in the base exhibition, the back of the painting was protected with non-woven Netex fabric.

Conclusions

The restoration of heritage objects in museum collections is of crucial importance to maintain and enhance their value. Many objects are vulnerable to deterioration due to the passage of time, exposure to light, humidity and other environmental conditions.

Through restoration, heritage objects are preserved for future generations and can regain their authentic appearance condition, which was lost over time. This is most important, in order to properly understand and appreciate the history and culture of which these objects are part of. The restoration work allows cultural objects to be properly exhibited and studied, contributing to public education and knowledge about their cultural and historical past. Ultimately a significant economic impact can be benefited of by increasing tourist attraction and income from cultural tourism.

Restoration of heritage assets contributes to preserving and promoting the cultural identity of a community or nation by preserving objects that represent unique values and traditions.

As far as the restoration log and documentation are concerned, they are extremely important, for several reasons:

- Documenting progress: the log and documentation serve as a detailed record of the restoration process and all decisions made during it; this is crucial for tracking the progress of the work and understanding the evolution of the restored object over time.

- Resources for future reference: the diaries and documentation provide insight into the methods and techniques used in the restoration process, which can be particularly useful for similar future projects.

- Evaluation and improvement of the methods applied: by analysing the journals and documentation, conservators and researchers can evaluate the effectiveness of the methods and techniques used in the restoration process; this can lead to continuous improvement of restoration practices.

- Contribution to scientific knowledge - restoration documentation can provide information about the materials used in restored objects, the technologies involved and their evolution over time.

- Conservation and protection of cultural heritage: journals and documentation provide a permanent record of conservation and restoration efforts of cultural heritage; this information is essential for the protection and preservation of cultural heritage for future generations.

[10] Ministerul Justiției. Copyright © 2024, https://legislatie.just.ro/Public/DetaliiDocument/24401.

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LIST OF ILLUSTRATIONS

1. The work "Landscape of Baia Mare", general view, before restoration - the front of the painting.
2. The work "Landscape of Baia Mare", general view, before restoration - the back of the painting.
3. The wedged stretching frame – detail.
4. Paint splashes on the stretcher.
5. The canvas – detail.
6. The missing anchoring nails.
7. The Impasto – detail.
8. Aging cracks.
9. Migration creases.
10. Adhering dirt.
11. Insect droppings.
12. Loss of paint layer.
13. The dusting.
14. The facing.
15. Applying the consolidant.
16. Removal of the oxidized old nails.
17. Vacuum cleaning the back of the painting.
18. The dry clean-up - The 'Wishab' dry cleaning sponge.
19. The dry clean-up - before and after – detail.
20. The penetrating preparation layer.
21. Removal of loose threads.

22. Cleaning test.
23. Cleaning test.
24. The filling.
25. The filling.
26. Structured filling.
27. The watercolour retouching.
28. The watercolour retouching.
29. Applying the retouching varnish.
30. The final retouching.
31. The frame anchoring.
32. General view after restoration - the front.
33. General view after restoration - the back.

ILLUSTRATIONS

1. The work "Landscape of Baia Mare", general view, before restoration - the front of the painting.

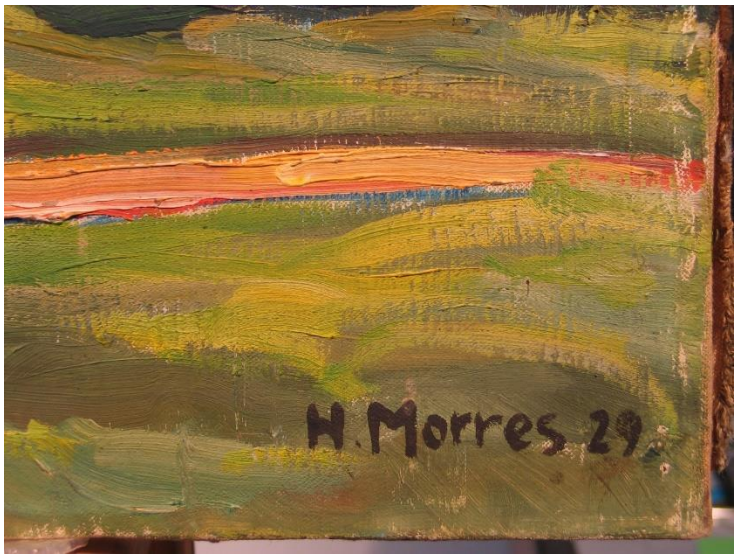
2. The work "Landscape of Baia Mare", general view, before restoration - the back of the painting.

3. The wedged stretching frame – detail.

4. Paint splashes on the stretcher.

5. The canvas – detail.

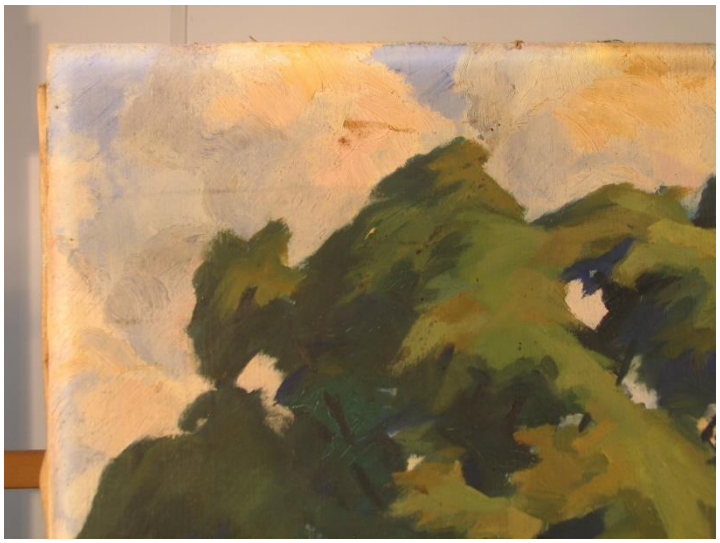
6. The missing anchoring nails.



7. The Impasto – detail.

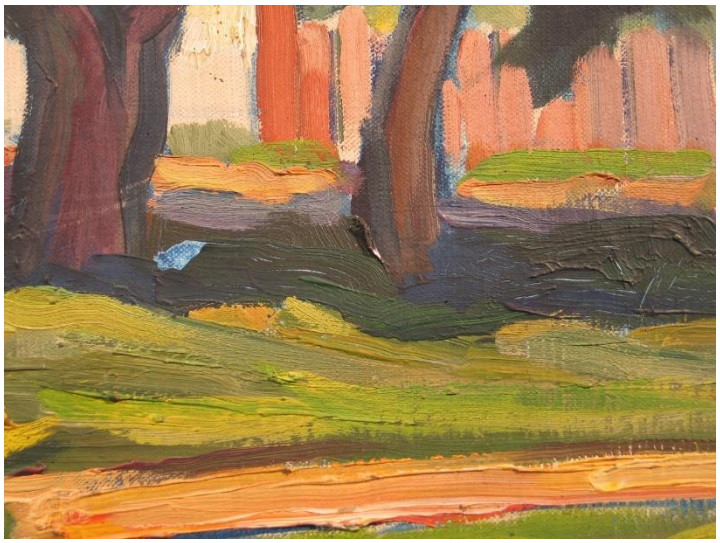
8. Aging cracks.

9. Migration creases.

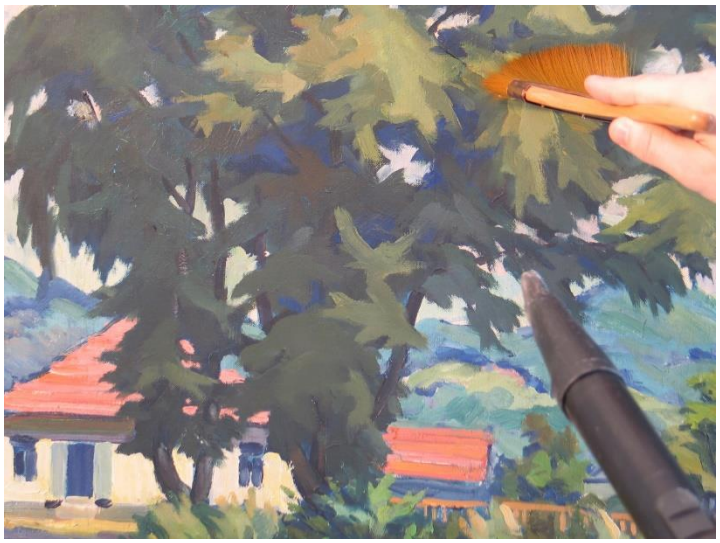


10. Adhering dirt.

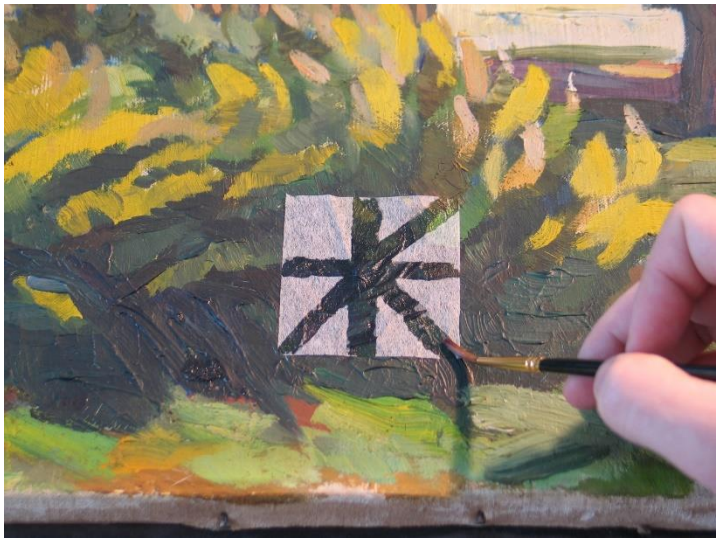
11. Insect droppings.



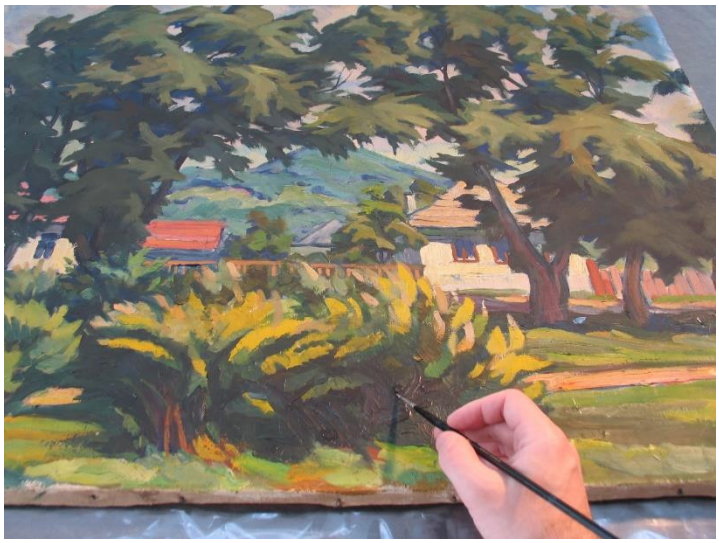
12. Loss of paint layer.



13. The dusting.



14. The facing.



15. Applying the consolidant.

16. Removal of the oxidized old nails.

17. Vacuum cleaning the back of the painting.

18. The dry clean-up - The 'Wishab' dry cleaning sponge.

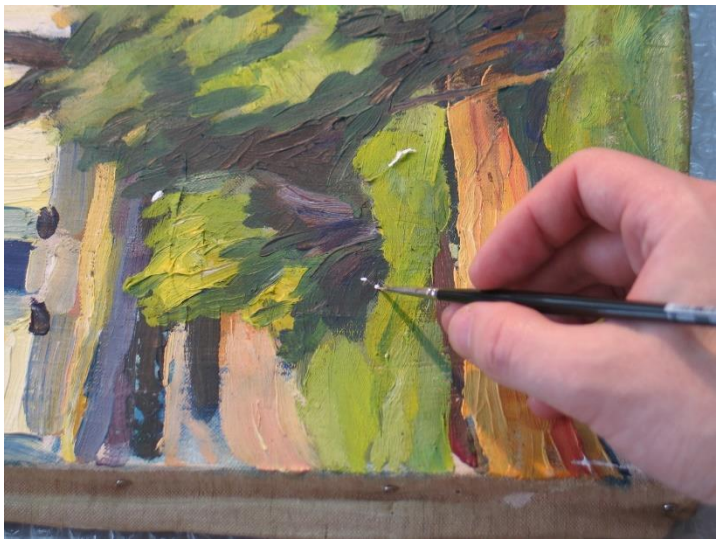
19. The dry clean-up - before and after – detail.

20. The penetrating preparation layer.

21. Removal of loose threads.

22. Cleaning test.

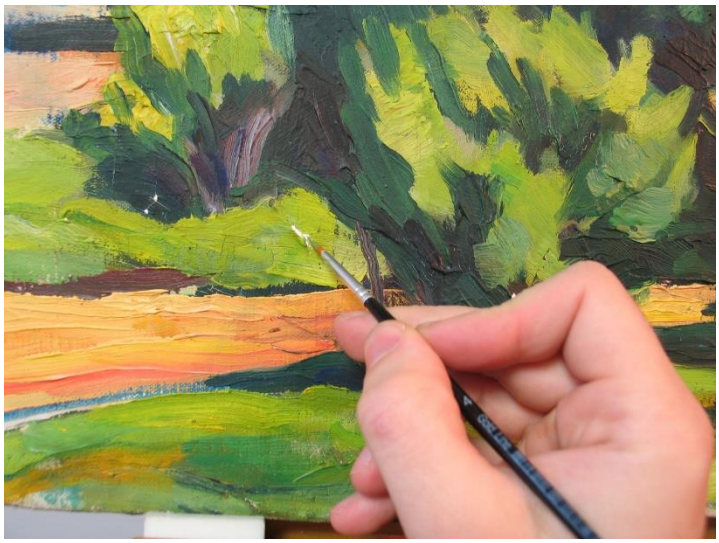
23. Cleaning test.



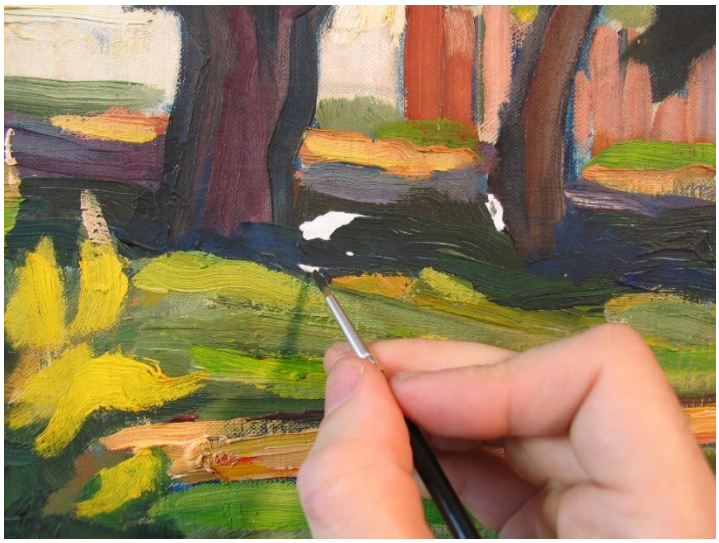
24. The filling.

25. The filling.

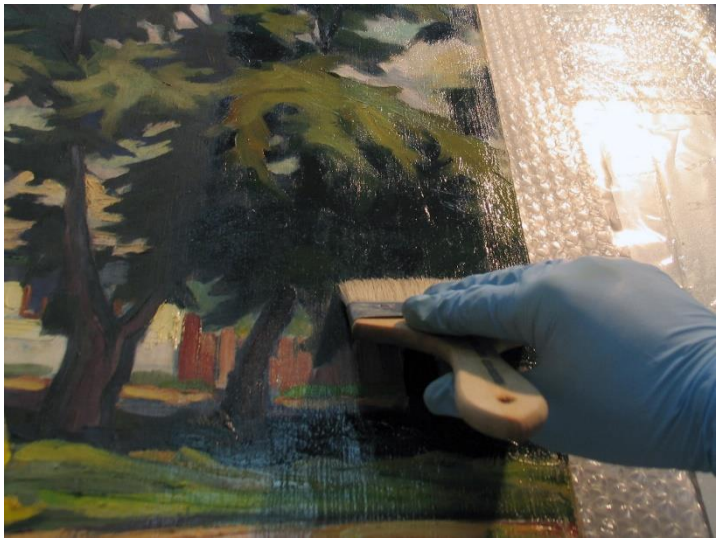
26. Structured filling.



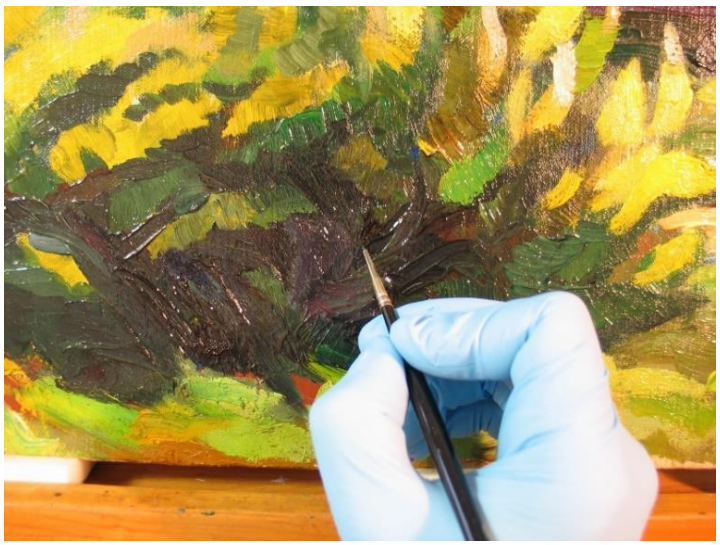
27. The watercolour retouching.



28. The watercolour retouching.



29. Applying the retouching varnish.



30. The final retouching.

31. The frame anchoring.

32. General view after restoration - the front.

33. General view after restoration - the back.

RESTORATION OF AN ICON ON GLASS "THE CRUCIFIXION OF JESUS"

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***Abstract**: This study describes the restoration process of an icon painted on glass, part of a collection that was acquired by the Mureș County Museum in 2003. The icon, which was painted in the 19th century in Nicula, depicts the Crucifixion of Jesus and is part of a collection of 42 glass icons. It is important both historically and artistically, and its state of preservation required careful restoration work to return its physical and visual integrity.*

***Rezumat**: Acest studiu descrie procesul de restaurare a unei icoane pictate pe sticlă, parte dintr-o colecție care a fost achiziționată de Muzeul Județean Mureș în 2003. Icoana, care a fost pictată în secolul al XIX-lea la Nicula, înfățișează Răstignirea lui Iisus și face parte dintr-o colecție de 42 de icoane din sticlă. Este importantă atât din punct de vedere istoric, cât și artistic, iar starea sa de conservare a necesitat lucrări de restaurare atente pentru a-i reda integritatea fizică și vizuală.*

***Keywords**: glass icon, Nicula, restoration, consolidation, chromatic integration.*

Cuvinte-cheie **:** *icoană pe sticlă, Nicula, restaurare, consolidare, integrare cromatică.*

The Mureş County Museum, through its activities of research, preservation, and valorization of cultural heritage, is constantly enriching its collections. In 2003, the icon collection of Dr. Silviu Petru Olariu was purchased. The collection includes 42 glass icons from the main centers of icon painting in Transylvania: Nicula, Ţara Bârsei, Şcheii Braşovului, Țara Făgărașului, Țara Oltului, and Mărginimea Sibiului, which have enriched the museum's collections, specifically those of the Ethnographic Folk Art Department.

The collector, Dr. Silviu Petru Olariu, was born on May 5, 1930, in the village of Sălişte, as the son of Petru Olariu, known as Petrea Dascălu. From an early age, he developed a passion for tradition, collecting ethnographic objects from surrounding villages (Orlat, Sibiel, Răşinari), including glass icons. In 1949, he graduated from the "Gheorghe Lazăr" High School in Sibiu, and between 1949 and 1959, he studied at the Faculty of Medicine in Cluj. During this time, he collected icons from Nicula. After completing his studies, he was assigned to Hunedoara and later to Târgu Mureş, where he continued to expand his collection with new pieces discovered in these areas.

Fluent in Hungarian, German, French, and English, Dr. Olariu also amassed a substantial bibliographic collection on glass icons. Due to his profession as a gynaecologist and university professor, as well as his position within the World Health Organization (where he worked for over 10 years in African countries), he collected traditional objects and African statuettes. He also pursued interests in graphic arts and painting, capturing the places he visited and the objects he cherished. For a time, he served as president of the "Liviu Rebreanu" literary council and published prose. Throughout his life, he collected over 100 glass and wooden icons.

After his death, his collection of icons was divided between his two children: Şerban, who settled in Canada, and Ruxandra, who moved to the USA. Only the part of the collection inherited by his daughter was purchased by the Ethnography Section, through the Ilarie Gh. Opriș. The other part was dispersed across Cluj and Suceava, with no records available for the icons.

The icon currently in question is part of Dr. Olariu's collection and is registered in the Inventory Register under position 2504 in the record of the Ethnography and Folk Art Department of the Mureş County Museum. Due to its poor state of preservation, it requires restoration.

In this icon on glass, painted at Nicula in the century. XIX, Jesus is represented on a red-orange cross on which there is the inscription on the left side [RĂ]STINCNI on the arm of the cross, and on the right side the REA LUI H[RISTOS]. The composition features Jesus crucified on the cross, with Saint John to the right and Saint Mary to the left (Fig. 1).

The icon is painted on a golden ochre background in a flat, uninterrupted manner. Jesus' body is outlined in a simple black line, with intersections marking the arm, forearm, deltoid, and wrist. His body and legs are also drawn in a simplified manner, with the sternum, ribs, and navel outlined. His head is tilted toward his right shoulder, with long locks of hair flowing down to his chest. The face is a slightly elongated oval, with dark brown hair outlined near the left ear. The eyes and eyebrows are slanted, with the outer ends of the eyebrows pointing downward. The nose and right eyebrow are drawn as a single wavy black line, positioned near the left nostril. The lips curve downward, with a mustache accentuating the curvature, reflecting sadness, as do the eyes. His short beard is indicated with parallel lines, slightly separated at the tip. The face and body of Jesus, as well as the figures of the two saints, are coloured with a white ochre, slightly greyed where the lines meet.

On the left side, we identify the woman with a green robe as the Mother of God. She is represented standing up to the level of the knee and having her hands on her chest together in prayer and her head is bent towards Jesus. His face is oval and rounded, his eyebrows are slightly arched and his eyes are marked with black on the upper eyelid and with grey shadow on the lower eyelid. The character is rendered with his face in semi-profile to the left and the right eye is joined to the right nostril by a curved line marking the cheek, the same with Jesus. The noses of all the characters are quite long and strongly wavy at the tip. The line of the lips is also wavy downwards in the middle, being drawn from two semicircles held in the middle (like wings) expressing sadness. The hands are drawn much simplified and with straight fingers with nails marked here and there. All in black line drawing. In the same way, the vestments and the recesses of the folds are drawn in black and the top of the folds, the lights are drawn in white, the so-called flashes by the iconographers. The halos of the three characters are drawn in black and made of gold leaf. The same leaf also appears in the upper part of the Savior's arms, between the arms and the cross.

The frame of the icon is original, made of resin slats and has three longitudinal channels on the face made with a chisel. The middle channel is deeper and thinner and the two lateral ones shallower and wider. Also made of fir wood was the back (the back of the icon) or the folder, as it was called in Nicula, of this protective panel, which in the case of this icon is missing, being replaced by a paper. The slats of the frame are cut at 45º and joined with wedges.

The icon is strikingly similar to the homonymous icon from the Ciobanu collection published as early as 1975 by the Dancu spouses on Plate 19 (Fig. 3). The technique of the icons on the glass shows the simplification of the means used by the peasant painters, like those of the potters or those

used to paint eggs, a fact that highlights even more the talent and artistic sense of the peasant craftsmen who created these works[1].

The old glass, used by icon painters at the beginning of glass painting, was obtained in manufactures (glaziers) spread throughout Transylvania. First by pressing on a slab and cutting on the edge of the support being small. Later it was made by blowing in the form of cylinders, which were cut and then ironed.

At the end of the century in the 19th century, industrial glass was already being used, thicker and greener, which softens the brightness of the colours. It is known that the properties of the glass, such as the composition, colour, thickness and appearance (with bubbles and smooth surface, or on the contrary, perfectly flat) are important arguments in the dating of the icons. The support of the "Crucifixion" icon is made of manufactured glass, a fact proven by its small thickness (it is thin) and its irregular appearance. An advantage of glass is the transparency, luminosity and brilliance it offers to colours. The disadvantage lies in the fact that glass is a fragile and non-absorbent support, hence the limited adherence of colours over time.

State of preservation

The support is uneven, also the glass is broken and some fragments are lost. On the unpainted side, the glass shows agglomerated dirt, especially around the frame. The dimensions of the icon are: 16 x 21.5 cm.

The colour layer of the icons on the glass consists of the drawing lines, the colour accents and the local tone superimposed on them[2].

A decisive role in weakening the resistance of the colour film is played by the organic binder, which through aging changes its adhesive-cohesive properties, becoming powdery or taking the form of scales that come off at the slightest movement of the glass in relation to the frame, thus we can observe: blind detachments (incipient), are those detachments manifested by the loss of adhesion to the support due to the aging of the binder. These are evolutionary degradations that will become free detachments, and finally we reach gaps in the colour layer.

At a simple direct observation, several types of dirt can be seen, distributed over the entire surface of the painting layer: superficial dirt (dust), which is removed mechanically, with the help of a brush with soft hair, adherent dirt (fixed on the colour layer), encrusted dirt.

The frame shows the fragility of the joints, due to the aging of the organic glue and, therefore, the loss of its adhesive-cohesive properties. We notice in the horizontal battens two cracks along the fibre determined by the wooden nails with which the original cover was fixed in the beginning.

A minor, inactive attack by xylophagous insects is observed, with several flight holes visible on the sides of the frame. The biological attack did not weaken the wood.

After visual examination, with the unaided eye in direct light and radiant light, photographs were taken in both direct light and radiant light - from different angles.

Tests were carried out on the pictorial layer, on the face of the glass, as well as on the frame, in order to determine the degree of compatibility between the materials to be used and the constitutive ones.

Diagnostic

The icon is in a poor state of preservation due to faulty handling and environmental factors. On the surface of the glazing and the frame there are deposits of superficial dirt adhering or encrusted.

[1] Irimie, Cornel, Focşa, Marcela, *Icoane pe sticlă* (Bucureşti, 1971), 23.
[2] Dancu, Iuliana, Dancu, Dumitru, *Pictura ţărănească pe sticlă* (Bucureşti, 1975), 58.

Fragmentation of the glass holder into several pieces due to faulty handling (and the protective glass added later is broken). Adherent dirt is present on both the surface of the icon and the pictorial layer. It is found that the pictorial layer is affected and as a result of inadequate interventions, the paper stuck on the surface of the colour layer with collagen-based glue caused the hardening and detachment of some colour scales.

Fluctuations in humidity, the nature of the pigments and the working technique also contributed to the appearance of cracks, blind detachments and in the form of free scales and lacunar areas on significant areas of approximately 5-10% of the icon's surface.

The main problem is the aging of the binders, which over time have lost their adhesive-cohesive properties and the dirt that has settled on the painting layer.

The frame and cover become fragile with the passage of time, but also due to improper storage conditions, inadequate handling or biological attack. Sometimes they even show losses of some component elements (corners, battens, boards). In our case, the original cover was lost and replaced by two pieces of thicker paper (thin cardboard) superimposed on the colour layer.

Degradation processes are evolutionary. Due to the aging of the binder, the pictorial layer loses its adhesion to the support, thus forming blind detachments. Then, these blind detachments, inevitably followed by free detachments where the scales of the pictorial layer have raised edges and, if not intervened by consolidation, will be lost, thus forming gaps.

Restoration interventions

The cardboard stuck to the frame was removed by sectioning along the fold with a scalpel. This was followed by the careful removal of the painted glass fragments from the frame (Fig. 4-5).

The mechanical cleaning of the color layer, aimed at removing superficial dirt (dust, insects, cobwebs), was carried out with a soft-haired brush, also assisted by a scalpel and tweezers when necessary.

Consolidation of the color layer was achieved by brushing it with an egg yolk emulsion at a concentration of 1:2 (one part egg yolk to two parts distilled water), along with salicylic acid, which serves as a preservative[3].

The egg yolk serves a dual purpose: it enhances the adhesion of the pictorial layers to the support in areas where the painting has exfoliated and, simultaneously, increases the cohesion of the pictorial layers weakened by the disaggregation of the binder or the abrasive action of the cover in the case of powdery paint. After softening the color layer, I gently pressed the color scales with my finger (this provides a level of sensitivity that no other tool can replicate), using a transparent, non-adherent foil (Melinex type) to facilitate the operation. This reduces the risk of damaging the color film and allows for permanent control of fixation[4].

Consolidation of the colour film is the most important step in restoring glass icons, as the health of the icon and the stability of the colour layer depend on its success. Consolidation and cleaning of the pictorial layer from adhering dirt were achieved with cotton pads soaked in egg yolk emulsion (1:3).

The fragments were reattached using two-component epoxy resin (Bison brand). Before gluing the shards, the contact surfaces degreased with alcohol and acetone. The adhesive components were mixed in a 1:1 ratio in small quantities, as the setting process is rapid. A small amount of glue was

[3] Alina Geanina Ionescu, *"Coordonarea procesului de restaurare a 6 icoane în cadrul Workshopului de restaurare icoane pe sticlă desfăşurat la Muzeul Judeţean Mureş"*, in *RESTITUTIO. Buletin de conservare-restaurare*, Nr. 7, (București, 2013), 45.

[4] Olimpia Coman-Sipeanu, *"Conservarea şi restaurarea icoanelor pe sticlă"*, în „Studii şi comunicări de etnologie", Tomul XVI, (Sibiu, 2002), 227 – 234; Mirel Bucur, *"Restaurarea icoanei pe sticlă „Sfânta Treime" de la Schitul Sub Piatră, comuna Sălciua, judeţul Alba"*, in *Conservarea şi restaurarea patrimoniului cultural*, vol. VII, Editura Trinitas, (Iaşi, 2007), 286

applied to the contact surface to avoid migration onto the color film. The fragments were placed face down on a non-stick, transparent polyester film placed on the work surface. A foil was placed over the fixed fragments, and a marble press was applied for 12–24 hours, which is the time required for the adhesive to reach its maximum strength. Excess adhesive was carefully removed with a scalpel (Fig. 22–23).

Chromatic integration was achieved through an imitative technique using watercolours, based on the preserved chromatic elements, ensuring a relatively symmetrical composition that naturally continued the form. Chromatic integration is usually a reserved, limited intervention. It is important to note that this intervention is reversible and was applied almost exclusively to areas meant to complete the support.

After degreasing the lacunar areas with a solution of alcohol and water (1:1), chromatic integration was achieved by imitative touch-ups using watercolours and egg yolk emulsion (1:3).

Frame restoration

Mechanical cleaning of dirt from the inner face of the frame was carried out with rough brushes. The frame rods were glued by inserting a thin blade into the socket, using more concentrated rabbit glue, which is more elastic than bone glue and has higher adhesiveness (20%).

The inside of the frame was cleaned with a weak mixture of solvents. The feathers and ends of the frame rods were cleaned of old glue using a scalpel, aided by rubbing with ethyl alcohol.

The inside of the frame was cleaned with a scalpel and a solution of ethyl alcohol, water, and a few drops of ammonia. The outside of the frame was cleaned with a solution from the Russian school, which contains in a liter of mixture: 500 ml water, 390 ml turpentine essence, 100 ml ethyl alcohol, 10 ml raw linseed oil, and 5–10 drops of ammonia.

Chromatic integration of the frame. On the cracks, Covidez RLP mixed with pigment was introduced, the excess was thinned with white spirit[5]

The installation of the icon in the frame was carried out with small pieces of synthetic felt glued to the fold of the frame with transparent thermal adhesive and the installation of the cover was carried out with new metal wood screws. This type of mounting is semi-rigid, limiting the play of the icon in the frame, without creating high tensions, with the potential danger of fragmenting the support.

For protection, a new cover adapted to the dimensions of the frame was made. Fixing the cover to the frame was done with wood screws. No hangers were installed because we propose to display the piece in the showcase on the support.

Storage recommendations and conclusion

It is recommended to keep the piece in optimal microclimate conditions, at a temperature of 18 – 22° C and a relative humidity (U.R) between 50 – 65 %, away from heat sources and direct light, in low-intensity incandescent lighting, exposed in equilibrium position.

The environmental conditions in which restored art objects are kept have a direct influence on their preservation over time. The conservation norms applied in museums and collections of art objects, provide for a correct monitoring of the following parameters: temperature, relative air humidity, lighting, air purity. Compliance with these parameters is useful and must be done strictly, both by museum curators and by private collections.

The environment chosen for storing the piece must be stable and constant from all points of view. Lower temperatures are recommended for warehouses because they slow down some degradation phenomena such as chemical and biological ones. A constant temperature is recommended for wooden

[5] Raluca Marilena Dumitrescu, ”*Restaurarea a trei icoane pe sticlă provenind din centrele de la Nicula şi Gherla, judeţul Cluj, România”*, in *ISIS*, nr. 10, (Székelyudvarhely, 2010), 166

objects. The recommended lighting level depends on the light resistance of the materials that make up the objects, in the case of the icon on the glass, it is stipulated that the lighting should not exceed 180 lux. The space where it will be stored must be well ventilated and free of dust.

The restoration preserved the original aesthetic of the icon and the work was done meticulously, with particular attention paid to maintaining the icon's historical value and ensuring that any interventions were reversible.

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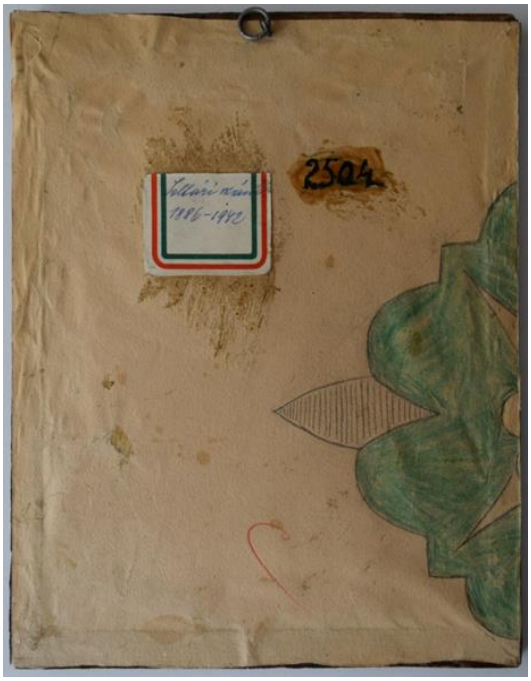
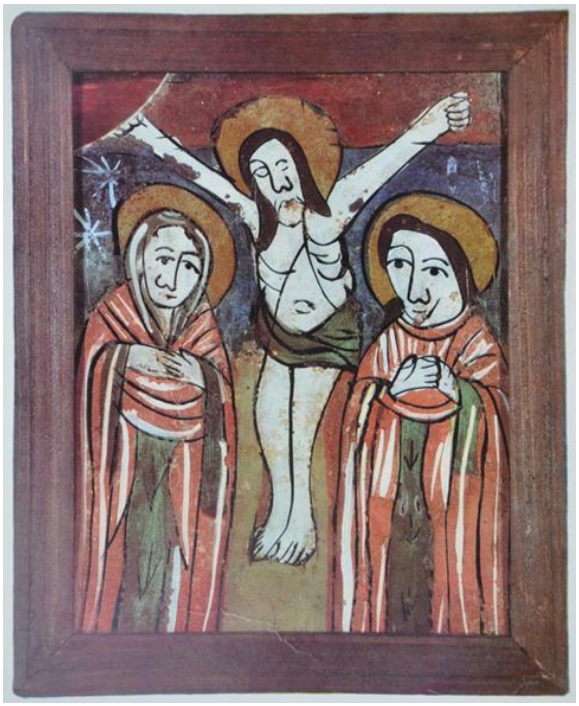
LIST OF ILLUSTRATIONS

1. *Crucifixion of Jesus*, front and back assembly before restoration
2. *Crucifixion of Jesus*, back assembly before restoration
3. *Crucifixion*, Nicula, Ciobanu Collection (After Dancu 1975, plate 19)
4. Extracting fragments from the frame
5. Extracting fragments from the frame
6. Fragments pasted on cardboard
7. Fragments after recovery
8. Appearance during the consolidation of the colour film
9. Sticking the fragments
10. Reverse aspect after planting the extracted colour scales
11. Details during paper thinning/removal
12. Details during paper thinning/removal
13. After chromatic integration
14. Installing the glass in the frame
15. Image to front assemble after restoration

ILLUSTRATIONS

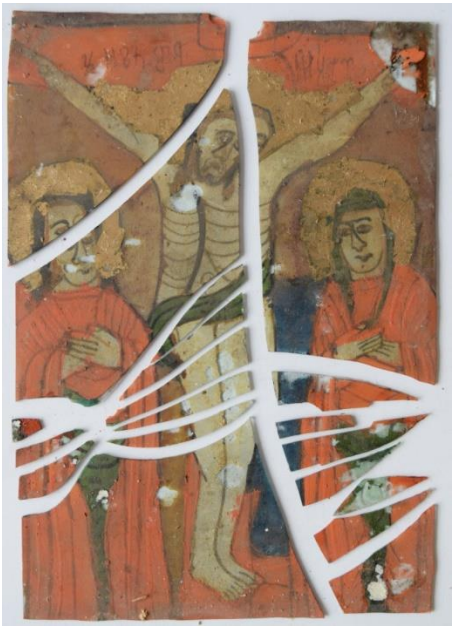
1-2. Crucifixion of Jesus, front and back assembly before restoration



3. Crucifixion, Nicula, Ciobanu Collection (After Dancu 1975, plate 19)


4-5. Extracting fragments from the frame

6. Fragments pasted on cardboard



7. Fragments after recovery

8. Appearance during the consolidation of the colour film

9. Sticking the fragments

10. Reverse aspect after planting the extracted colour scales

11-12. Details during paper thinning/removal

13. After chromatic integration

14. Installing the glass in the frame

15. Image to front assemble after restoration