

III. PRACTICAL THEOLOGY

COLOUR IN MURAL PAINTING: VIRTUE IN CONSERVATION AND RESTORATION

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ABSTRACT. This study analyzes an essential part of the painting technology regarding the colours, their various origins and uses, critical factors in determining the final aspect of the paintings. Numerous varieties of coloured materials differ from each other in terms of brightness, mattness, transparency, covering power, etc. Thus, identifying the chemical compositions of colours by means of laboratory tests is mandatory in the restoration interventions. Only utilizing this scientific method can colouring materials be classified. Through the specialized interventions of mural painting restorers, chromatic truths are uncovered and valuable contribution is brought to the knowledge array regarding methods and colours in painting. In mural painting colour symbolizes tradition and innovation and the art of restoration ennobles and turns almost forgotten masterpieces into works of art worthy of contemplation.

Keywords: mural painting, colour, investigation, conservation, restoration, chromatic

*„If drawing is of Spirit and colour of the Senses,
you must draw first, to cultivate the spirit
and to be able to lead colour into spiritual paths”- Matisse.*

Mural painting involves a series of *technological processes* that encompass the science of methods and also the materials usage and processing means. Through restoration, no matter the technique used, the original appearance of the painting often alters. These changes can be caused by historical events, natural calamities, repainting, vandalism, incompatibility between materials,

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etc. In the process of unravelling them, historical documents and investigation methods specific to restoration are used, all with the purpose of collecting the information needed to establish the intervention methods.

Examining the wall surfaces and drawing up an intervention project in the process of conservation-restoration are preliminary steps in finding out the causes of the changes in the aesthetics of the paintings, which determine the required intervention methods. Inspecting the paint layer can reveal surprising data regarding the building of the monument or the historical events it was subject to¹.

At the same time, the *stratigraphic examination*² of mural painting uncovers the eventual need of emergency interventions meant to stop degradation and eliminate its unwanted effects. Over time, mural painting is marked by “the implacable effects of historical time”³ and the technique used to create the painting is “the first key which opens the path of action in restoration”⁴.

A natural ageing of pigments⁵ or even that of mortars (the base of the paint layer) leaves its mark on the surface of the painting. The material ageing phenomenon is inevitable and leads to irreversible degradation with undesirable effects; it can be delayed by the intervention of restorers, but it can never be stopped or eliminated. Also, through ageing, primers and binders lose their cohesion properties and thus, the colour layer becomes brittle or it exfoliates. Mural painting exposed to an aggressive microclimate⁶ is subject to extensive degradation processes in the base layer, resulting in cracks or crack networks which can reach the surface of the painting layer.

An important part of the *painting technology* is *knowing the colours*, their various origins⁷ and use, key factors in determining the final aspect of

¹ Oliviu Boldura, *Movileştii: Romanian History and Spirituality*, vol. III (Suceava: Muşatinii, 2007), 151.

² The preservation status of the ensemble can only be established by examination and by a series of investigations on the materials used, the execution technique, the identification and timely interventions, the type of degradation and its causes. The monument is to be inspected all along the intervention and in the case of paintings, any new, unpredictable issue will be analysed in order to identify the etiopathology of degradation, Corina Popa, „Restoration and Research. Case Study: Mural ensembles of Berca, Potlogi, Măldăreşti and Tg. Hurezi”, in *The Notebooks of Restoration* (Bucharest: ACS, 2014) 123.

³ Ioan Darida, “The Restoration of Mural Painting Topoloveni-Inuri”, in *The Notebooks of Restoration*, (Bucharest: ACS, 2014), 164.

⁴ Anca Bratu, *Mural Painting of Maramures: Painting Craftsmen and Stylistic Interferences* (Bucharest: ACS), 333.

⁵ C. Săndulescu-Verna, *Materials and Painting Technique* (Timișoara: Marineasa, 2000), 67.

⁶ Iulian Olteanu, Gabriela Olteanu, “National Bank of Romania”, in in *The Notebooks of Restoration*, (Bucharest: ACS, 2014), 20.

⁷ Săndulescu-Verna, *Materials and Painting Technique*, 67.

the paintings. Numerous varieties of coloured materials differ from each other in terms of brightness, mattness, transparency, covering power, etc. Thus, identifying the chemical compositions of colours by means of laboratory tests is mandatory in the restoration interventions. Only by means of this scientific method can colouring materials be classified⁸.

Colour degradation in mural works of art can also have interactive causes such as: deficiencies in pigment manufacturing, high atmospheric humidity at the time of painting, bacteria and fungi appearing in organic binders in unventilated dark places⁹. At the same time, repainting seriously affects the integrity of the original work of art and also the usage of improper materials which cover parts adjacent to the painting results in the loss of the original painting material. The discovery of mural ensembles hidden under repainted surfaces entails the need to reconsider the value of the restoration work.

In the context of various types of degradation in terms of image alterations determined by the degree of exposure, the climatic agents can strongly influence the preservation condition of outdoor paintings. The water resulting from rain or melted snow that wash the outdoor painting, leads to severe degradation and may aggravate some construction and structure problems¹⁰.

Considerable surfaces of paintings are lost due to stationary humidity, especially in the lower parts of walls, phenomenon which leads to the maceration of the base layer, the emergence of gaps and erosion, which ultimately cause the loss of colour. Humidity caused by condensation, to which humans are contributing by using the monument, indicates the lack of proper ventilation and uniform temperatures. The degradation of the roof triggers the infiltration of humidity, which in turn determines the migration of substances from the wall mass to the surface of the painting, thus generating sometimes massive loss of the painting layer and the developing of biologic attacks¹¹.

Thus, atmospheric humidity and temperature combined with the wall humidity and temperature, atmospheric pollution and the materials used for the mural painting represent causes of the painting layer degradation. Aesthetically,

⁸ Ibid., 70-72, Colours are classified according to appearance, origin or source, i.e. natural or synthetic. They are also classified based on their chemical composition, i.e. organic or inorganics and according to the characteristic of the colouring materials: covering power, resistance, the consumption of binders, hydrophobia, toxicity, grinding and drying.

⁹ Boldura, *Movilești*, 157.

¹⁰ Oliviu Boldura, *Mural Painting in Northern Moldavia. Aesthetic Modifications and Restoration*, (Bucharest: ACS, 2013), 16.

¹¹ Florea Oprea, *Biology for the Conservation and Restoration of the Cultural Heritage* (Bucharest: Maiko, 2006), 10.

the chromatic relations undergo alterations based on often irreversible chemical effects, such as oxidation, which reduces the shine of the metal foils covering the surfaces.

The in situ analysis can highlight multiple causes, often mixed, in the development of colour layer alteration. Construction flaws lead over time to wall cracks and dislocations and therefore to colour layer deterioration. Regular cleaning cause air drafts and dust particles to move and adhere to the painting surface, whereas by wiping or washing the walls, many painted surfaces fade away, sometimes completely.

The permanent usage of a building when in poor conservation state is another factor that can weaken the integrity of the mural painting. The sources of degradation should be removed before any work of restoration is performed, but failure to observe restoration principles¹² entails additional degradation. Cleaning the mural surfaces, consolidating the painting layer and performing chromatic integration, though motivated by aesthetics, must follow some scientific principles so as to best preserve and protect the respective work of art¹³.

The intervention on mural painting with the most impacting visual effect is *the chromatic integration* of the colour layer, action that cannot be finalized without thorough examination of the support layers. In all mural paintings, no matter the tradition, an innovating concept emerges¹⁴, thus the process of chromatic integration must be performed responsibly, in line with the specific techniques used to create the painting.

There have been cases when historically and artistically valuable mural surfaces were lost in historical contexts¹⁵, or merely due to unqualified human intervention. Changing the architectural shape by oversizing the windows, building or eliminating the pulpit, changing the shape of arches, building annex spaces are just a few elements that can lead to considerable losses of painted surfaces. During these types of remodelling the colour coat degrades when exposed to whitewash unskilfully applied or construction material debris¹⁶.

Another factor with severe repercussions on the painting layer is the usage of mixed techniques and dry retouches¹⁷. Applying colour layers after the calcium hydroxide carbonation process has ended, using different types of

¹² Cesare Brandi, *The Theory of Restoration* (Bucharest: Meridiane, 1997), 109.

¹³ I. Olteanu and G. Olteanu, "National Bank of Romania", 24-25.

¹⁴ Bratu, *Mural Painting of Maramures*, 82.

¹⁵ *Ibid.*, 152.

¹⁶ Darida, "The Restoration of Mural Painting Topoloveni-Inuri", 165.

¹⁷ C. Săndulescu-Verna, *Materials and Painting Technique*, 384.

materials¹⁸ to build the walls, having uneven thicknesses of mortar or plaster not covering the surfaces homogeneously, can damage the painting due to cohesion issues. These flaws make the colour layer react differently due to physical and chemical characteristics specific to each technique and thus the conservation requires additional care.

To conclude, we may say that the colour layer can be affected from one or two directions. The first one refers to problems identified on the outer side of the wall, as mentioned above, which cause repercussions on the interior of the wall. The second direction refers to the inside part of the wall, the surface of the colour layer, which can be affected by superficial erosions and polishing, especially in the lower areas where furniture is placed or people rub against the walls¹⁹.

The major variances between mural painting techniques require the support layer to be handled differently, otherwise serious alterations and chromatic migration of the painting layer may occur, proof that the execution technique is flawed. Restoration carried out by unskilled people can lead to the deterioration of mural surfaces. Thus, washing areas affected by smoke with off the shelf products and then repainting those surfaces without having consolidated the pre-existing colour layer, combining mixed techniques (water based and oil based colours) result in stylistic and chromatic alterations that do not match the original.

The analysed mortars often bring information regarding the causes of mural decorations deterioration, execution methodology, constituent materials and various particularities. Slaked lime obtained from poor quality limestone, with impurities or traces of clay, low quantity or lack of hemp fibres, traces of vegetation, all lead to the degradation of the plaster layer. Materials used in this way, or in the presence of humidity, damages the colour support layer and consequently the colour deteriorates due to fissures, cracks, gaps of different depths and surfaces, macerations, erosions and friability.

Among the visible damaging of the colour layer we can mention powderiness and exfoliation, two phenomenon with complex causes which ultimately lead to the disappearing of the layer. In some cases when chromatics fade, we can still find legible traces of the drawing. Even if “the visual impact is

¹⁸ Theo Mureşan, “Mural Painting ‘a fresco’ on Stone”, in in *The Notebooks of Restoration* (Bucharest: ACS, 2014), 209, “The different reactions of stone and brick to humidity and temperature factors demand technological caution: masonry homogeneity (...) We must acknowledge the technical difficulty imposed by a stone support, by an inhomogeneous support, the placement of the homogenous areas of stone or brick, the composition characteristics, the presence or absence of preparation layers”.

¹⁹ Bratu, *Mural Painting of Maramures*, 333.

due to the brightness of the colours"²⁰ and sometimes the stratigraphic erosion allows us to see a superficial bump that contours a shape²¹, a piece of clothing or a face, reconstruction based on surfaces would go beyond the principles of restoration. Shape and colour, different from each other, are perceptual means that we can recover through specific operations, without altering the authentic appearance. Consolidating the colour layer must be done responsibly, so as to prevent the chromatic layers from accidentally and irreversibly being removed.

Aesthetic alterations of the original painting are due also to using unstable pigments in the presence of environmental factors. Samples of pigments from the affected area and compared tests²², highlighted special cases where chromatic alteration is clearly delimited. Thus, we consider that in order to preserve the colour layer over time, eliminating the sources that enable the damaging and choosing high quality materials are paramount.

Pigment alteration through physical and chemical irreversible processes appears at exposure to high temperatures and smoke, especially in areas where candles are lit or inadequate heating systems are used. When pigments turn brown or black, the original aspect of the painting is lost and the chromatic range becomes narrow. Besides various factors that change the authentic expression of image, we can identify another cause – the man himself, the one who is supposed to actually protect the work of art. We can often notice incisions, accidental or premeditated scratches, name carving, dates and messages, which degrade the painting.

Specialized restorers perform a stratigraphic examination of the mural painting, which identifies the type of materials used, the stages of the painting process and the execution techniques and methods applied. The technical

²⁰ Rudolf Arnheim, *Art and Visual Perception. A Psychology of Creative Sight*, trans. Luminița Ciocan (Iași: Polirom, 2011), 317.

²¹ Ibid. "Per se, shape is better means of identification than colour, not only because it offers a lot more types of qualitative differences, but also because the distinctive features of shapes are more resistant to environmental variations. (...) Shape is not affected by changes in brightness or colour in the environment, whereas the local colour of objects is very sensitive to them".

²² Boldura, *Movileștii*, 155. In order to understand the process of enamel alteration at, pigment samples were collected in the white chalky areas and the blue ones and were examined under a MC 5 microscope. After comparing particles of the same strength and size, a powdering phenomenon was noticed for the discoloured pigment as compared to the particles of unaltered enamel. The altered pigment does not maintain physical properties similar to the unaltered one, becoming powdery. This phenomenon is explained by the way the pigment is prepared. If the proportions of the substances composing the glass are not respected, manufacturing flaws appear. Following its interaction with water, the enamel will have a larger number of alkalis which interact with cobalt, resulting in the loss of its blue colour and in diminished resistance to attacks of environmental factors.

procedure of mural paintings is closely related to the composition of the support layer and this is the first one of the painting conservation parameters²³. Stylistic options revealed through specific restoration procedures²⁴, such as the usage of grout, drawing and colour to fill in the gap areas, ensure a unitary image of the painting.

Colour is a valuable testimony, no matter what art movement it belongs to. It transmits “the savour of time” through tones and shades. The way colour is applied is proof of the assimilation of the “local artistic inheritance which persists like a subjacent lode on which characteristics of various styles will graft over time”²⁵. The problems faced in the attempt to preserve artistic particularities and certain types of alterations, can fundamentally influence aesthetic appreciations.

Limiting chromatic interventions and carefully emphasizing the colour sophistication denote the restorer’s professionalism. He renders all the chromatic brightness of the past, ensuring the painting conservation²⁶. “All the factors favouring the degradation process, the natural ones but also unskilled human intervention, deeply influence the restorers ‘decisions’²⁷. The encounter with mural painting contributes to finding a state of mind where preserving the individuality and image quality is paramount.

Throughout history we can identify various artistic and aesthetic concepts that led to the disappearance of numerous mural paintings with rich pellicles of colour, applied using diverse techniques. Therefore, the restorers’ efforts should be invested in preserving as much *chromatic substance* as possible, in such a way that over time it can show that pigment – basis of all colours, defines the technique, completes and perfects the monument.

Without colour, we cannot speak of mural painting and the “aesthetic interpretation is determined first and foremost by the image’s ability to communicate the artistic message”²⁸. Building an edifice involves responsibility, the correct attitude when choosing building materials, observing the steps and times of execution. Failure to follow these steps renders the painting confuse in terms of chromatic quality.

²³ Pia Stinghe, “Mural painting in oil,” in *The Notebooks of Restoration* (Bucharest: ACS, 2014), 234

²⁴ *Ibid.*, 233, “One of the fundamental principles of contemporary restoration is to maintain and preserve the monuments in line with their original individuality. During restoration, materials compatible with the old ones and traditional work techniques and any intervention must be discreet and reversible, its purpose being to reconstruct the original aspect of the monument. The restorer must act like a doctor: find the causes of degradation and remove them and establish the most appropriate methods of intervention in such a way as to ensure it lasts over time”.

²⁵ Dana Jenei, *Gothic Mural Painting in Transylvania* (Bucharest: Noi Media Print, 2007), 47.

²⁶ Corina Popa, *Medieval Monuments in Oltenia* (Bucharest: ACS, 2011), 104.

²⁷ Bratu, *Mural Painting of Maramures*, 333.

²⁸ Boldura, *Mural Painting in Northern Moldavia*, 15.



Images during the mural painting at *The Summer Altar*,
Bixad Monastery, Satu-Mare County.

The restoration of mural works of art is a multidisciplinary approach. The conservation and restoration of mural paintings requires the joint efforts of a restorer, an architect, an art history specialist, a chemist, a biologist, a hydrologist, a construction engineer and last, but not least, a painter. An efficient work group will produce exact information on all the painting characteristics and this way, the final intervention –*chromatic integration*, will shape visual harmony. The actions of the restorers are conditioned by *the methodology* of each mural painting and support technique.

The conservation and restoration of mural paintings that embellish in a unique way, by means of stylistic and technical elements, buildings, churches, chapels, libraries or palaces, contribute as witnesses of the human creative value. “Once restored, the painted decoration reveals the true artistic and historic significance and highlights the authenticity of the entire architectural ensemble”.²⁹

²⁹ Bratu, *Mural Painting of Maramures*, 337.

These ensembles are impressive through their monumentality, style, proportions, chosen themes or other elements, but the artistic particularity is reached the most when they are emphasized by chromatic congruence.

Through the specialized interventions of mural painting restorers, chromatic truths are uncovered and valuable contribution is brought to the knowledge array regarding methods and colours in painting. We conclude that for the final presentation of each work of art, the decorative purpose of the painting must be taken into consideration, in such a way that the chromatic integration grasps the authentic image. In mural painting colour symbolizes tradition and innovation and *the art of restoration* ennobles and turns almost forgotten masterpieces into works of art worthy of contemplation.

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