

# Challenges of Conservation and Restoration of a Medieval Wall Painting in the Church of Saint Leonard in Mala Ligojna and the Question of Its Authorship

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——— The Church of Saint Leonard is positioned on a hill above a small village called Mala Ligojna in central Slovenia. The Baroque architecture shows elements of medieval origins. Under many secondary whitewashes, fragments of an approximately 500-year-old secco wall painting were discovered. The conservation and restoration project started in the year 2020 by removing the secondary coatings of limewash on the northern wall. During the work process, some challenges regarding the original painting were addressed and possibilities for uncovering and consolidating preserved *intonaco* and the paint layer were explored. Research on the binder, pigments, and the substrate was executed, which led to the use of a specific consolidation system. During the work process we researched the authorship of the painting. The research included the review of different Gothic stencils, brocade and border patterns, and the system of transferring the drawings and identifying the incisions. The patterns show similarities to some known Gothic wall painters in Slovenia, who inherited their knowledge from the masters of the international Gothic style. By carrying out projects like this, the church's history is being revealed and the knowledge of the medieval wall paintings in Slovenia is expanding.

*Keywords:* Gothic wall painting, conservation and restoration, secondary coating, consolidation, authorship.



1.  
Church of Saint Leonard in Mala Ligojna, municipality of Vrhnika, central Slovenia, photo by Eva Marija Fras, 2020

## Introduction

Many sacral heritage artefacts from the Gothic and Baroque eras can be found in Slovenia. All over the country there are many churches with wooden gilded altars, Baroque pulpits, rich oil paintings, and old organs, but not all of them have preserved wall paintings. Many wall paintings are still hidden underneath secondary layers and previous interventions, waiting to be uncovered and presented.

In 2005 a probe was carried out in the Church of Saint Leonard in Mala Ligojna [fig. 1] that uncovered traces of a medieval wall painting. Fifteen years later a project to uncover the entire northern wall was initiated in search for more historical evidence about the church.

Very early in the conservation-restoration process there were problems regarding the removal of secondary layers due to the instability of the paint layer. Because of possible (in)compatibility of the phases, steps in the process were adjusted. The project is ongoing and will be finalized in 2022. The main aim is to uncover and preserve all the remains of the painting and

reveal new information about the church and the painting masters of the Gothic period on Slovenian soil.

### The Church of Saint Leonard

The Church of Saint Leonard is located on a small hill above the village of Mala Ligojna in central Slovenia. Adoration of Saint Leonard spread in Slovenia in the fifteenth century, so the church may be from that period. It was supposedly built by local farmers and was first mentioned in the year 1526 as part of the defense against the Turks.<sup>1</sup> More information comes from the seventeenth century, when three altars were present in the church as they are today. No written historical evidence mentions wall paintings. There is a painted cartouche on the ceiling made by Janez Buh around the 1940s.

The main entrance to this stone-built church is through the bell tower on the western side of the church. A person enters under the choir, which stands on two massive pillars. The interior is composed of one church nave and a presbyterium with a small sacristy. The church is a small village type. The length of it, with the bell tower, measures 19 meters.

During the Baroque period, some architectural changes to the interior were carried out [fig. 2] – the choir on the western side was added as well as two pilasters on the northern and two on the southern wall. The pilasters continue into the vaulted ceiling that replaced the old, supposedly wooden coffered ceiling. These Baroque-era transformations, including the window on the northern wall, caused significant damage and loss of substance to the original painting.

Probing in year 2015 on the interior walls showed promising parts of a painting on the northern wall as well as on northern side of the presbyterium. On other sides of the presbyterium no remains of historical paintings were found. There has not yet been any probing carried out in the dome of presbyterium. Some remains of a later decorative painting were found on the southern wall, but there has been no uncovering process carried out yet.

The paintings on the southern and northern walls are from different eras and will be interesting to compare once all the walls are uncovered. As seen from the probes on the northern wall and the northern side of the

1 Matjaž Ambrožič, *Sv. Jurij in sv. Lenart v Ligojni* (Vrhnik: Župnija, 2004), 7.



2.

Northern wall with the choir; pilasters, vaulted ceiling, and window added in the Baroque period, photo by Eva Marija Fras, 2020

presbyterium, both are typical for this type of church in this region. These paintings are from the same era and only uncovering the presbyterium could reveal differences, if there are any.

### The wall painting

The painting stretches along the whole northern wall and comprises approximately 24 m<sup>2</sup> (6 meters wide by 4 meters high), minus the parts that were covered in the Baroque period. On the left side, it is interrupted by the later addition of the choir and pilasters in the central area of the wall.

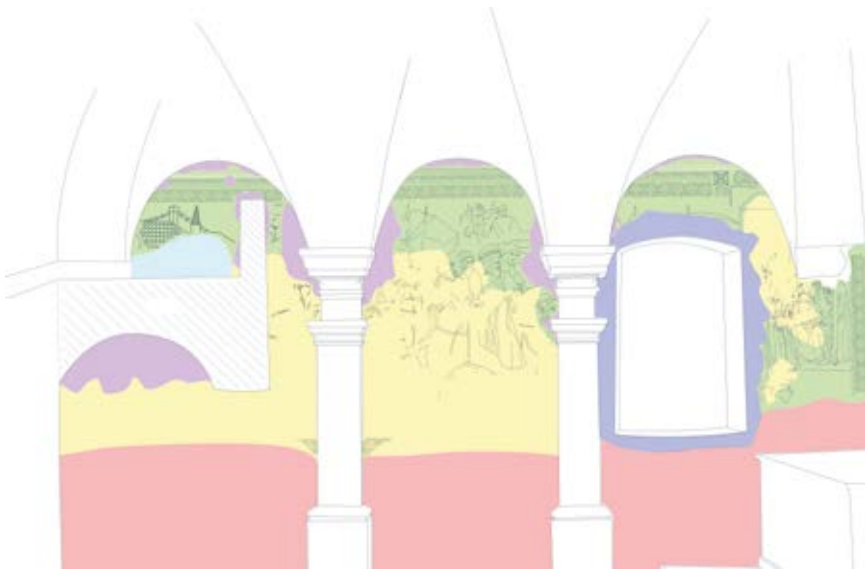
#### State of conservation

In the upper part of the wall, the paint layer is well preserved, while in the lower part, the adhesion of the paint layer and the plaster is strongly reduced due to active humidity [figs. 3, 4].

The general state of the painting is stable; it has some localized cracks and smaller craquelures. During the uncovering process, it was found that the paint layer on some parts of the wall is very well bonded with the secondary layer, and this will be problematic to remove without inflicting damage on the original.



3. Northern wall: visible gradual loss of the paint layer from the upper to the lower area, photo by Eva Marija Fras, 2020



### Legend

- Good preservation of the paint layer
- Medium preservation of the paint layer
- Minor fragments of the paint layer
- Lost carrier and paint layer
- Latter plaster
- Area lost in baroque

4. Degree of preservation of the paint layer on the northern wall in Mala Ligojna, made by Eva Marija Fras, 2020

### Problems with the work process

Conservation and restoration work is adjusted through the working process, depending on the needs and condition of the painting. During the uncovering process, we must analyze different systems for removing whitewashes and consider the interactions and compatibility of the phases in the process. Since the paint layer isn't completely stable, it is important to assess whether the removal of the whitewash is the first step or whether consolidation should be the primary procedure. In this situation all options were considered and tested.

### Removal of secondary layers

#### **Mechanical removal**

The removal of secondary whitewashes began mechanically using a scalpel, chisel, and hammer. There were approximately twenty layers of secondary whitewashes. They were mostly solid and thick. The first secondary whitewash was solid and broke from the surface in small patches. The second secondary whitewash was of a different composition than the first or any of the following in that it was an ochre hue and powdery and soft. It contained some small to medium hard ochre fragments, but mostly it was just ochre dust with weak cohesive and very strong adhesive bonds.

During the uncovering it was noticeable locally, on some larger areas, that the paint layer was already abraded and damaged before the application of the first historical whitewash. Also, in some areas the first whitewash fell off before the application of the second, ochre, whitewash. On these areas the ochre layer was bonded strongly with the paint layer [figs. 5, 6], and it presented the first problem we encountered in the process.

Due to the lack of cohesion and the strong adhesion it was not possible to remove the layer using a scalpel. The whitewash could be thinned but not completely removed. Various tests were carried out using various rubbers, sponges, and brushes, but none could break the very strong adhesion with the paint layer.

At this point, consolidation tests of the paint layer were carried out through the ochre layer.



5.  
Central part of the  
northern wall: a  
large area of ochre  
whitewash, photo by  
Eva Marija Fras, 2020



6.  
Areas with ochre whitewash on the northern wall, made by Eva Marija Fras, 2020

### **Pre-consolidation**

The aim of pre-consolidation was to stabilize the paint layer to the degree that its cohesive bonds were stronger than the adhesive bonds between the paint and the ochre whitewash. Since we know that originally lime was used as a binder, we tried to refresh and consolidate the paint layer with lime and ammonium carbonate.

Lime was used in the form of a dispersion of calcium hydroxide nanoparticles used to solidify historic porous carbonate materials. There are variations of commercial products using nano-lime, with different particle sizes, dispersed in alcohol.

The commercial product Nanorestore<sup>2</sup> was used in a solution with an isopropanol of ratio 1:1 and was applied on chosen area over Japanese paper by brush. It was left on the wall until the paint layer had absorbed the consolidant and the solvent had evaporated.

Ammonium carbonate can be used as an agent for the chemical removal of secondary layers or, since it can transform sulphates to ammonium salts, it can act as a consolidant for porous carbonate surfaces. A 10% ammonium carbonate solution in distilled water was thickened with cellulose pulp<sup>3</sup> and applied to the wall over two layers of wetted Japanese paper. After 50 minutes, the pulp, with one layer of Japanese paper, was removed. The ammonium carbonate pulp causes salts to migrate to the surface; therefore, we needed to extract them with gentle pressing of a wet sponge on the wall. To avoid any surface abrasion, the second layer of Japanese paper was left on the wall while extracting the salts.

In all trials the ochre layer absorbed the consolidant, leaving very little through to the painted surface, resulting in a slightly consolidated paint layer under an even more consolidated ochre layer. Though the paint layer was more stable, this approach was not optimal.

### **Chemical removal**

When problems regarding the removal of the ochre whitewash occurred, tests for its chemical removal were carried out.

The first test for chemical removal was performed using a cotton

<sup>2</sup> *Nanorestore UN1993* (C.T.S. S.r.l.).

<sup>3</sup> *Technocel 200 and 1000* (CFF GmbH & Co. KG).



swab wetted with water. The ochre whitewash absorbed the water, and it became softer and started melting. Circular motions with the cotton swab resulted in the ochre smearing and residues left. This option was not ideal, so the water was thickened with agar-agar to control the penetration better. As mentioned before, the ochre layer was very dusty, and now it absorbed all the water from the gel. Because the gel dried out, this method was discounted. At this point it was not clear what the composition was or which kind of binder was used in the ochre layer.

The same test with cotton swab was carried out using ethanol thickened with Klucel G.<sup>4</sup> Clearly, the dusty ochre had lost a lot of moisture over time, so it was expected that the result would be the same. This gel dried out, as any other probably also would, so this overall method was discarded.

### **Solution**

After all the aforementioned tests for chemical removal and pre-consolidation were fruitless, a glass fiber brush was tried out.<sup>5</sup>

When using the brush, it was important to constantly follow the structure of the wall, since there are many bumps and peaks in the structure of the *intonaco*. The hardness of many thin glass fibers in combination with soft, even strokes resulted in a complete removal of the problematic ochre whitewash. In specific areas it was still a bit troubling, but to keep the paint layer intact, it was acceptable to leave minimal residue [figs. 7, 8].

### **Consolidation**

Since the wall painting had weakened the adhesive bonds in some areas, especially on the blue sky (strong pulverization), it was necessary to consolidate the paint layer.

### **Choosing the consolidant**

Lime has been frequently used in historical buildings as a binding material, either for a lime mortar and as a binder for pigments.

<sup>4</sup> *Klucel G*, Kremer Pigmente GmbH & Co. KG.

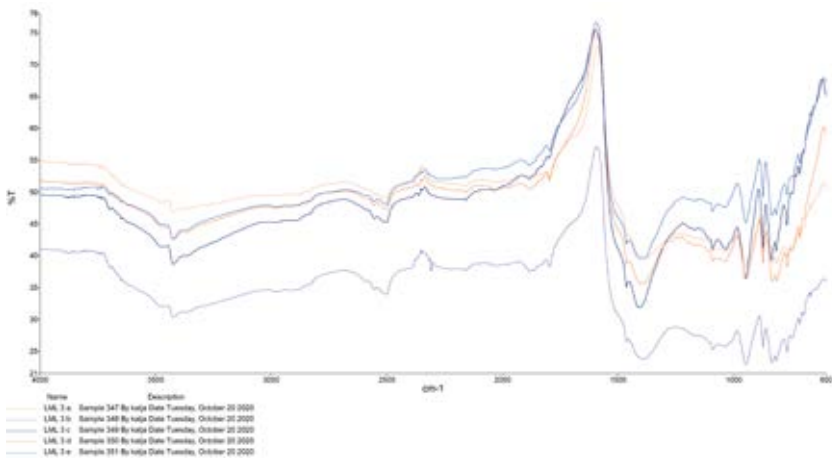
<sup>5</sup> Glass fiber brush is originally used to clean electrical circuits. Its use gradually expanded to other professions and many different purposes. The brush consists of many hard glass fibers that work like an eraser. While using the brush it is important to use protective glasses, gloves, and a mask with respirator to protect against inhalation of particulates of glass fibers.



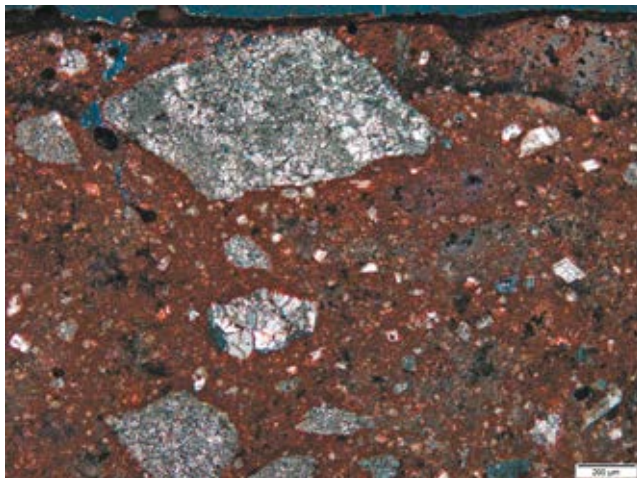
7.  
A. Thinning of the ochre layer with a scalpel; B. Removing of ochre residues with glass fiber brush, photos by Eva Marija Fras, 2020



8.  
Difference between the uncovered painting on the left and the thinned ochre whitewash residue on the right, photo by Eva Marija Fras, 2020



9.  
FTIR spectrum of the blue sample showing peaks for azurite, photo by Eva Marija Fras, 2020



10.  
Thin section of *intonaco*,  
treated with Alizarin  
Red S dye, differentiating  
dolomite from calcite,  
photo by Eva Marija Fras,  
2020

To choose a compatible consolidant, samples were taken of all the pigments as well as the plaster. Examination of the pigment samples was made by FTIR, Raman, and XRF, which revealed the presence of calcium carbonate in every sample and hematite in the red pigment, which implies the use of red earth. The results showed peaks for green earth, azurite for blue [fig. 9], and limewash for white color.<sup>6</sup>

Extraction of the binder was performed, which resulted in calcium carbonate. A thin section of the *intonaco* was stained with Alizarin Red S dye to differentiate dolomite from calcite. The aggregate stayed intact, indicating a dolomite substrate [fig. 10].

We needed to act in accordance with ethical principles for conservation-restoration procedures. The intention is to use appropriate materials and methods for each specific treatment. Professionals working in the field should act within the limits of personal competence as well as within the limits of available facilities.<sup>7</sup>

To avoid any unwanted reactions, the required properties of consolidants must be considered, such as their compatibility with the substrate, pigments and binder; their penetration and durability; the degree

<sup>6</sup> Eva Marija Fras and Katja Kavkler, "Poročilo naravoslovnih preiskav, Mala Ligojna – cerkev Sv. Lenarta", in *Investigation report: Mala Ligojna – Church of St. Leonard* (Zavod za varstvo kulturne dediščine Slovenije, 2021), 16.

<sup>7</sup> "Our code of ethics; code IV", in *The American Institute for Conservation and the Foundation for Advancement in Conservation*, accessed November 22, 2022, <https://www.culturalheritage.org/about-conservation/code-of-ethics>.

of restored cohesion; their ease of use; the compatibility of the materials; the minimum solvent content; and no color change after the consolidation.

We reviewed the most used consolidants on historical wall paintings in Slovenia and consulted this information to choose a compatible consolidant.<sup>8</sup> To follow ethical guidelines, we eliminated all synthetic organic materials (acrylic resins, polyester resins, vinyl polymers, epoxy, etc.) and focused only on the inorganic materials most appropriate for this kind of wall paintings. The most suitable treatment was chosen from the following list.

An aqueous solution of calcium hydroxide was eliminated for its low solubility. Even at high concentrations it is not suitable for consolidation, and we would have an intake of large amounts of water that could be destructive for the painting.

The barium hydroxide method was eliminated for its interaction with magnesium in the plaster, which causes highly soluble salts of magnesium sulphate to form, resulting in yellowing or darkening of the surface.

In the case of consolidants using ammonia, they could react with some pigments, for example malachite, which is chemically very similar to azurite. To avoid any color changes of the paint layer, any use of consolidants containing ammonia was discarded (ammonium carbonate, ammonium oxalate, diammonium phosphate).

The only consolidation system that met most of the requirements was alcoholic dispersions of calcium hydroxide nanoparticles, used to solidify historic porous carbonate materials. There are some commercial products based on nano-lime with different particle sizes and concentrations. Nanorestore and CaLoSil<sup>9</sup> were tested.

<sup>8</sup> Sabina Kramar, and Andreja Pondelak, "Uporaba utrjevalcev" (Use of consolidants), in *Priložnik: muzejska konzervatorska in restavratorska dejavnost* (Ljubljana: Skupnost muzejev Slovenije, 2001), chapter 5.3.3, 1–11.

<sup>9</sup> Nanorestore® (C.T.S. S.r.l.) is a commercial product of dispersion nanoparticles in 2-propanol in concentration 5 g/L with average particle size 250 nm. For optimal penetration particle size should be 10–100 times smaller than the pore size on the surface. It is important to note that multiple applications (10 times and more) of low concentration or the use of very high concentrations (50g/L) could develop whitening of the surface and that at high temperatures of the working space, the alcohol in the consolidation system could evaporate too quickly, resulting in poor penetration into the surface and whitening of the surface.

CaLoSil® (IBZ-Salzchemie GmbH & Co. KG) is an alcoholic dispersion of calcium in short chain alcohols such as ethanol, 1-propanol, and 2-propanol in concentration range 5–50 g/L, with average particle size 50–250 nm. It can be used on limestone surfaces like mortar, plaster, stone, wall paintings, marble, etc. Because of smaller particles it penetrates deeper; therefore it is more suitable for consolidation of *intonaco*.



11.  
Application of nanolime by brush over  
Japanese paper, photo by Eva Marija  
Fras, 2020

Nanorestore was used in a solution with 2-propanol in ratio 1:1. It was applied in one generous layer by brush over one coating of Japanese paper to the paint layer on the entire northern wall [fig. 11]. The consolidant was left on the wall until the solvent had evaporated and the Japanese paper fell off. The stability of the paint layer was tested before and after consolidation with wetted cotton swabs. On all pigments there was a significant enhancement of the cohesive and adhesive bonds. Consolidation on areas with blue pigment azurite, which consists of larger particles, was not yet optimal. On those areas, the second application of Nanorestore took place, which resulted in substantial stabilization of the paint layer. After the treatment there was no white veil or other changes of the paint layer visible.

CaLoSil was used on the lower parts of the wall, where the plaster was broken and cracked. It was applied in one generous layer by brush over

one coating of Japanese paper. As with Nanorestore, CaLoSil was left on the wall until the solvent had evaporated and the Japanese paper fell off. The broken parts of *intonaco* and the plaster underneath it were stabilized but required another treatment with the consolidant. After two applications, the binding of the broken areas of the lower parts of the wall was optimally restored.

### Research into the authorship of the painting

Historical wall paintings in Slovenia can be defined by styles specific to different time periods and artists. From the late thirteenth century onwards, we can see external influences from neighboring lands north of the Alps and from Italy in the west. Development of styles is seen in the fading of the late Romanesque style and the implementation of the early Gothic expressive style, maturing into the Gothic linear style. In the second half of the fourteenth century, there were more Italian influences that introduced more realism in the paintings.<sup>10</sup>

### Comparative research

Characteristics of the painting in Mala Ligojna were compared to other paintings from the same time period and region. The preparation of the surface for painting was inspected, including the composition of the plaster, pigments used, and the binder, and other characteristics typical for the creation of a classical Gothic wall painting.

In the central region of Slovenia, where the painting in Mala Ligojna is located, we find wall paintings from individual masters who had extensive workshops and many apprentices. There is the well-known Master Bolfgang and his successors: Master of St. Jacob from Ribno, Master Leonard, and a Master from Mače. Not all the masters' names are known, and they are therefore named for the location of their most known work or by initials found on the paintings.<sup>11</sup>

Similar paintings among the possible artists were compared and inspected for painting style. The border and brocade patterns used, the visible incisions in the plaster, and the formations of scenes were compared.

<sup>10</sup> Janez Balažič et al., *Gotika na Slovenskem* (Ljubljana: Narodna galerija, 1995), 221.

<sup>11</sup> Anabelle Križnar, *Slog in tehnika srednjeveškega stenskega slikarstva na Slovenskem* (Ljubljana: Založba ZRC, ZRC SAZU, 2006), 79.

### **Creation of the wall painting<sup>12</sup>**

Gothic wall paintings in Slovenia are executed in the *fresco*, lime, or *secco* technique.

In the *fresco* technique, the artist paints on fresh plaster with pigments mixed with water or lime water. Pigments must be durable in the alkaline environment. Therefore, natural earths and minerals were typically used. Lime is used as a binder in the fresh plaster and bonds pigment particles through the process of carbonatization. As the paint is applied onto a wet surface, the lime bonds with the pigment's particles and absorbs them onto the surface. This technique is very resistant to water, air, and light interactions.

The lime technique means to paint fresh layer of lime onto dry plaster. Pigments are mixed with lime milk, which gives the paint a specific pasty, white tone. Pigments must be durable in an alkaline environment, like with the *fresco* technique. The lime milk in the paint bonds pigments to the fresh lime surface. However, the binder from the pigment bonds only with the freshly applied lime layer, which is why this technique is not as permanent as the *fresco*.

In the *secco* technique, the paint is applied to dry plaster using pigments mixed mostly with organic binders. Water-soluble binders such as egg, milk, casein, starch, or animal glue were typically used in medieval wall paintings. For water-insoluble binders oils, wax, or resins can be used. With the addition of emulsifiers (animal glue, egg yolk, casein) the pigment palette becomes extensive, as the binder can be mixed with any pigment. Because there is no absorption of the paint layer into the carrier, this technique is the least permanent.

Artists often mixed different techniques, for instance painting the majority of the piece using *fresco* and later adding highlights in *secco*.

### **Plaster**

Plaster was usually applied in three to seven layers and would serve as a leveling mortar on a rugged stone wall as well as a carrier and the surface layer for the painting.

<sup>12</sup> Anabelle Križnar, *Slog in tehnika srednjeveškega stenskega slikarstva na Slovenskem* (Ljubljana: Založba ZRC SAZU, 2006), 17, 18.

In this region, plaster was typically composed of lime binder with sand as the aggregate. The aggregate was usually acquired from a local quarry. Sometimes there were additions of organic or inorganic compounds to enhance the mechanical strength and durability of the plaster or to adjust the drying speed. The creators of the painting would add inorganic materials such as crushed brick, pozzolan earths, or marble, or organic materials such as animal fur, casein, sugar, oil, or blood. Sometimes they added pigments to impart a specific tone to the working surface.

The plaster on the painting in Mala Ligojna was applied on a mostly stone support with some local clay brick inserts. As seen on severely damaged areas, there were at least three layers of plaster. Analysis on the latest layer of plaster showed lime binder with dolomite sand, with no additives.

A sample of the plaster with the pigment was inspected under a microscope, which showed very little or no penetration of the paint into the plaster. This tells us that the paint layer was applied on dry plaster.

### **Pigments**

The most frequently used pigments in Gothic wall paintings are natural earth pigments. It is best to use pigments resistant to active humidity, light, and alkaline binder. The most used pigments are red and yellow ochres, umbres, green earths, and minerals such as malachite, azurite, lapis lazuli, and cinnabar.<sup>13</sup>

On the painting in Mala Ligojna, we can find red and green earths, azurite, and yellow and red ochres. The artist used a very simple palette, mixing the same pigments for draperies and skin tones.

### **Binder**

“The choice of the type of medium used to paint the wall depends on various factors, such as the type of pigment chosen, the historical period and the geographical location. Specific chemical, physical and optical properties are required for the binder, in order to fully perform its function ...”<sup>14</sup> The binder should cohere pigment grains and allow optimal adhesion to the

<sup>13</sup> Križnar, *Slog in tehnika srednjeveškega stenskega slikarstva na Slovenskem*, 37.

<sup>14</sup> Antonella Casoli, “Research on the Organic Binders in Archaeological Wall Paintings”, *Applied Sciences* 11, 9179 (Oct. 2021): 3.



surface. The painting medium must comprise a homogeneous fluid, allowing it to be easily applied. It should dry to a solid, resistant, non-sticky, elastic layer. The binder must not react chemically with the pigments and should be resistant to photochemical and atmospheric reactions. It should be transparent with no specific color to retain the optical characteristics of the pigment.<sup>15</sup>

In light of the stratigraphic review of the penetration of the paint layer to the plaster, it is most likely the painting in Mala Ligojna was executed with the *secco* technique.

Depending on the chosen binder for the *secco* technique, we define different painting techniques, commonly recognized as tempera, for example, egg tempera or casein tempera.<sup>16</sup> Vasari, Armenini, and other influential Italian art connoisseurs used the word *tempera* as equivalent to the use egg yolk.<sup>17</sup>

Spectroscopic analysis of the paint layer in Mala Ligojna showed no presence of oils, wax, resins, or any specific water-soluble binder. It is possible animal glue or casein were used since the analysis showed some weak peaks typical of the presence of protein. But since there were no strong peaks visible, the use of any of the proteins mentioned cannot be confirmed. Optical investigation of the paint layer under a microscope suggests a very diluted, watery binder was used. The paint layer is very thin, any abrasion immediately shows the plaster beneath, and the paint layer locally comes off in flakes.

### **Pontata**

On closer visual examination, using raking light, two *pontatas* are noticeable, which indicate areas of plaster applied at the same time, leaving visible seams. The two *pontatas* suggest that the plaster was applied in three rounds to cover the entire wall. On paintings created in the *fresco* technique, we find more seams which suggest that the plaster was applied in many rounds, allowing the artist to paint only on a wet surface. The two *pontatas* on the painting in Mala Ligojna indicate that the painting was executed in the *secco* technique.

<sup>15</sup> Casoli, "Research on the Organic Binders in Archaeological Wall Paintings", 4.

<sup>16</sup> Križnar, *Slog in tehnika srednjeveškega stenskega slikarstva na Slovenskem*, 18.

<sup>17</sup> *The Book of the Art of Cennino Cennini, A Contemporary Practical Treatise of Quattrocento Painting*, trans. Christiana J. Herringham (New York: Routledge, 2018), 183.

### **Incisions**

On Gothic wall paintings, artists often made straight incisions in fresh plaster, using a ruler, to indicate the borders of individual scenes or for architectural parts of the painting. Incisions were often made on parts of figures as a guide for the composition. Also, artists would incise areas to make a border between a painted area and another application, for example, gold on the halos or crowns.

Using raking light, we found direct incisions on draperies and the king's crown. The edges of the incisions are smooth rather than rough, which indicates they were made in fresh plaster.

### **Punzonatura**

*Punzonatura* is a decorative technique where an artist would press differently shaped tools into fresh plaster. It is often found on kings' crowns, halos, belts, and collars. The type most often found is straight punctured lines around the halos, indicating golden rays. *Punzonatura* in Mala Ligojna has been found on horses' bridles and on a king's crown.

### **Interpretation of the painting**

The painting in Mala Ligojna is preserved fragmentarily in large areas. The area under the choir is mostly lost, and no specific object can be identified. On the opposite side, above the choir, is an almost completely preserved part of a castle with hills and a blue sky [fig. 12]. Continuing towards the central area of the northern wall, between the choir and the first pilaster in the nave, are fragments of a small hut in the background that could be interpreted as an animal shelter. In the foreground are fragments of people's clothing. Lower down, we can distinguish some parts of horses' legs.

In the central area of the wall, between both pilasters, the scene starts in the upper lunette with an unevenly painted blue sky and continues down to light green hills with some dark accents and the lanceolate endings of two flags. A black linear drawing of the basic shapes of a castle stands on a simplified hill in the background.



12.  
The painting above the  
choir in Mala Ligojna,  
photo by Eva Marija  
Fras, 2020



13.  
Central part with  
figures and a part of  
the horse on the right  
by the pilaster, photo  
by Eva Marija Fras,  
2020



14.  
Scene on the right, Mary in blue and red clothing holding baby Jesus (only a white silhouette), photo by Eva Marija Fras, 2020

In the foreground of the lower part, at least four people are distinguishable. We can immediately identify one of the kings because he is wearing a crown and green royal brocades. The other people are younger; therefore, we can assume they are the kings' escort, the horsemen and musicians. They are all preserved only in the upper part, the head area. By the right pilaster is a very well-preserved head of a horse with a harness, which the king is riding [fig. 13].

In the middle and lower area of the central part, the paint layer is preserved only fragmentarily, indicating only areas of the same paint used. We can assume the general shape of the kings' draperies and the size of the horse. There are also some fragments of other people and draperies that cannot be assigned to any specific figure.

On the right part of the wall, the painting was partly damaged by the Baroque window, and the painted blue sky continues from the left part. On the right, by the window, we can distinguish large red and blue drapery, which was commonly used for Mary's clothing [fig. 14]. By the shape of the drapery, we can follow her silhouette and conclude that her head



15. Northern wall in the Church of St. Leonard in Mala Ligojna, after uncovering, photo by Eva Marija Fras, 2020

was unfortunately covered by the secondary ceiling. In her lap, almost all the paint layer is lost, but there is a visible silhouette of the baby Jesus. He stretches out his right hand to one of the kings, who is bowing before him, offering a gift. The king is preserved only in small fragments on the left, as the rest was destroyed by the installation of the Baroque window (see fig. 13).

Despite the extensive loss of the paint layer, all the fragments of the wall painting clearly indicate the scene of the Journey and the Adoration of the Magi [fig. 15].<sup>18</sup>

### **Border patterns**

Border patterns were usually painted along the edges of the painting and/or for the division of individual scenes. We can follow the border pattern on the entire upper edge of the wall; evidently, it marks the position of a former Gothic ceiling and thus the height of the Gothic building. The border starts in the left upper corner of the wall by the vault, is interrupted twice by two vaults, and follows the edge of the painting to the upper right corner. It continues partially on the right vertical edge of the painting, where it comes into contact with the triumphal arch wall.

<sup>18</sup> Richard Stracke, "The Adoration of the Magi", in *A Guide to Christian Iconography: Images, Symbols, and Texts*, revised November 13, 2016, accessed May 30, 2022, <https://www.christianiconography.info/magi.html>.



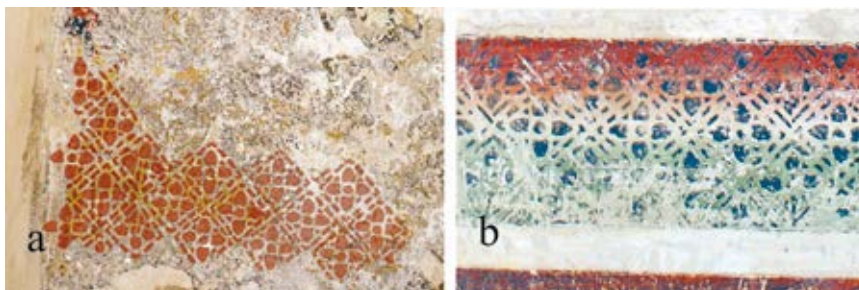
16.

A. Border pattern in Mala Ligojna; B. Border pattern in Vrzenec – Master Leonard; C. Border pattern in Krtina – Master Leonard, photos by Eva Marija Fras, 2020



17.

A. Corner element in Mala Ligojna; B. Corner element in Krašče – Master Leonard, photos by Eva Marija Fras, 2020



18.

A. Border under the choir in Mala Ligojna – a reconstruction; B. Border pattern in Krtina – Master Leonard, photos by Eva Marija Fras, 2020

The border pattern is composed of a wide red line as the external borderline and two bands of border patterns below. The first is a homogeneous red geometrical stencil pattern on a white background and the second is a black floral stencil pattern on a green, white, and red horizontally oriented background [fig. 16 A].



19.  
King with royal drapery, detail, photo by Eva Marija Fras, 2020



20.  
King's brocade pattern in Mala Ligojna, emphasized detail, made by Eva Marija Fras, 2021



21.  
Scene with Mary holding baby Jesus, with a brocade pattern underneath, photo by Eva Marija Fras, 2020



22.  
Brocade pattern in Mala Ligojna, emphasized, made by Eva Marija Fras, 2021



23.  
Textile pattern used by Master Bolfgang and his apprentices, drawing taken from: Alenka Vodnik, *Tekstilni vzorci v srednjeveškem stenskem slikarstvu na Slovenskem*, 1998, 149

Specific patterns are known to be used by individual artists and/or their apprentices. Similar border patterns to those in Mala Ligojna were used by Master Leonard in the Church of St. Kancijan in Vrzdenc [fig. 16 B] and in the Church of St. Leonard in Krtina [fig. 16 C].

The corner geometrical elements in the border patterns show similarities to those in Master Leonard's painting in the Church of St. Andrej in Dole pri Krašcah [fig. 17].

Another link to Master Leonard's border patterns is seen under the choir. A geometrical floral pattern in Mala Ligojna is red on a yellow background, while in the Church of St. Andrej in Krtina, it is black on a red, white, and green horizontal belt [fig. 18].

### **Draperies and Brocades**

One of the more recognizable features on Gothic wall paintings is brocade patterns on royal draperies [figs. 19, 20] and as a decorative border pattern [figs. 21, 22]. Since the brocade is preserved well enough to determine basic elements of the pattern, it can be compared to the collection known to be used by masters on Slovenian soil [fig. 23].<sup>19</sup>

A perfect match was found with a pomegranate pattern, where small branches have leaves and a stylized pomegranate. Above is a pointed arch, continuing to the central element with a seven-leaf rosette with a pomegranate. This pattern was used in churches in Zgornje Gorje, Mevkuž, and Mirna by Master Bolfgang, in Rudnik near Ljubljana by Master Leonard, and in Jamnik by Master Bolfgang or one of his successors.

<sup>19</sup> Alenka Vodnik, *Tekstilni vzorci srednjeveškega stenskega slikarstva na Slovenskem* (Ljubljana: Znanstveni inštitut Filozofske fakultete, 1998), 63–162.



## Templates

For the basic layout of the painting, the artist used graphic templates and transferred them onto the wall using carton cutouts. He transferred the figures by making incisions in fresh plaster. For the creation of scenes and for individual figures, mostly saints, Master Bolfgang,<sup>20</sup> Master Leonard, the Master from Mače, and others often used templates from Master E.S.<sup>21</sup> and *Biblia Pauperum*.<sup>22</sup> Master Leonard also used graphical templates from the Master of the Berlin Passion.<sup>23</sup>

Artists sometimes focused on different values they wanted to express. For example, Master Leonard rearranged individual scenes on the walls, in comparison to classical Gothic wall paintings in this region. In the painting in Krtina, he didn't follow Christological scenes chronologically and arranged scenes up to the point where apostles lose their original aspect in the formation of heavenly Jerusalem. In the Church of St. Andrej in Dole pri Krašcah, Master Leonard painted a Closed Garden on the northern wall, where the Adoration of the Magi was typically painted. This is why he is also known as Master of the Closed Garden. There are also four scenes from Christ's passion that are not in order.<sup>24</sup> Overall, we see fewer direct uses of graphical templates in Master Leonard's works.

In the process of documentation, a linear reconstruction based on incisions took place [fig. 24]. Recognizable lines and shapes were added and compared to Master E.S.'s engravings. A close match was found to his copperplate Nr. 27 [figs. 25, 26]. The template mirrored vertically shows the same basic positions of main persons and architecture. This template is the possible guideline for the motif where a king pays homage to baby Jesus.

20 Simona Kermavnar, "Bolfgangus de...cz... (med 1400 in 1450–po 1465)", in *Slovenska biografija* (Slovenska akademija znanosti in umetnosti, Znanstvenoraziskovalni center SAZU, 2013), accessed May 30, 2022, <http://www.slovenska-biografija.si/oseba/sbi1019760/#novi-slovenski-biografski-leksikon>.

21 Master E.S. is one of the most important engravers of the second half of the 15th century in Germany and the North. His name is not known. The earliest engravings are dated in the beginning of the 1450's and bear a relation to late gothic sculpture of mid-fifteenth century in Germany. He left behind over 314 engravings, due to popularity of the prints in the past, are all rare. Master E.S. created much more engravings; some are preserved only in copies by Israhel Van Meckenem.

22 Janez Höfler, *Umetnost srednjega veka na Slovenskem, Slikarstvo* (Ljubljana: Oddelek za umetnostno zgodovino Filozofske fakultete v Ljubljani, 2000), 22.

23 Janez Höfler, "Leonard – mojster fresk v cerkvi sv. Andreja pri Krašcah", in *Zbornik za umetnostno zgodovino*, letnik 27, številka 27 (1991): 59.

24 Janez Höfler, "Leonard – mojster fresk v cerkvi sv. Andreja pri Krašcah", 55.



24.  
Central part of the wall  
with emphasized lines and  
incisions, made by Eva  
Marija Fras, 2021



25.  
Master E.S., copperplate No. 27, image taken  
from: Janez Höfler, *Der Meister E.s.: Ein Kapitel  
europäischer Kunst Des 15. Jahrhunderts*, 2007



26.  
Emphasized lines and incisions, Mary holding baby  
Jesus, made by Eva Marija Fras, 2021

Some parts of the drapery are formed differently, but that is a minor change often seen in Leonard's works. The formation of the drapery changes in the development of different gothic styles and later in development when artists used more variety in the formation, adding more folds and volume to the drapery.

### **Formation of figures**

Even though the artist used templates for the painting, there is still a significant personal touch noticeable in the painting in Mala Ligojna. The templates were a basic guideline for the composition and formation of figures and draperies.

The personal touch of the individual artist is one of the most diverse aspects to investigate and study. Each artist has a slightly different perception of a figure and will paint it with their own personal touch. Even just a small difference in the intensity of the paint or the stratigraphy of dark and light tones can make a big change in the overall feeling of the painting.

The qualities of faces can be compared in paintings attributed to Master Bolfgang with those in Mala Ligojna, and his light, thin strokes with barely visible eyes, noses, and lips are recognized [fig. 27 C]. The skin tone is very subtle and gentle with no specific highlights. The formation of faces is often recognized as a feature of a single artist. It is significant that Master Bolfgang's proportions and lines don't match the dark tones around the eyes and a specific worried expression on the forehead on paintings in Krtina and in Mala Ligojna. In Bolfgang's paintings, the shape of the eyes and eyebrows is very subtle and gentle, while in Master Leonard's paintings, we can notice more humble, blissful expressions, with darker accents and more overall plasticity in the faces [fig. 27 B]. Comparing the two, we can see a very similar formation of faces in Master Leonard's paintings and in Mala Ligojna [figs. 27 A, B, 28].

Master Leonard's brush strokes for individual hairs are gentle and thin, following the logical movement of the curls. For younger men, brown pigments were used, while for more important figures he used grey and brown mixtures with the addition of white.



27.

A. Comparison of the king on the painting in Mala Ligojna; B. A man in Krtina – Master Leonard;  
C. St. Gregory in Mirna – Master Bolfgang, photos by Eva Marija Fras, 2020



28.

A. Comparison of musicians in Mala Ligojna; B. A musician in Dole pri Krašcah – Master Leonard, photos by  
Eva Marija Fras, 2020

There are also a lot of similarities to the painting in Mače painted by the Master from Mače, Leonard's associate. [fig. 29]. The layout for the scene was formatted using graphical templates similar to those in Mala Ligojna [fig. 30]. The figures are very gentle, with soft transitions from dark to light. A closer look reveals that the faces show more similarities to those in the church in Mirna, painted by Master Bolfgang. This shows the influence of Master Bolfgang's heritage on his successor, the Master from Mače.

The uncovered painting on the northern wall is preserved fragmentarily and will be reintegrated into the whole after the conservation process. Areas of complete loss will be stabilized and filled with new plaster of the same composition as the original. As there is such a variety of



29.  
Adoration of the Magi in Mače, painted  
by the Master from Mače, photo by Eva  
Marija Fras, 2020



30.  
The painting in Mala Ligojna, central  
area, photo by Eva Marija Fras, 2020

preserved painted areas, the newly added parts will be aesthetically adapted to blend into the whole wall. There will be some space left for possible changes on the surface of the newly added areas. The application of plaster should be a couple of millimeters under the original and the surface must be a little rougher to keep the slightly darker and cooler tone on the surface. This allows us to add another thin layer of final plaster later if the general tone of the northern wall does not appear unified with the painting in the presbyterium. The tone of the plaster can be adjusted by adding different sands or pigments.

Probing revealed fragments of another painting on the northern side of the presbyterium, which show similarities in the formation of the

figures on the northern wall, but also differences in the pigments, binder, and stratigraphy. Uncovering and conservation-restoration of the presbyterium will be a future project and will give us more assurance about the conclusion regarding the artist of the painting.

### Conclusion

In every conservation and restoration intervention, it is important to assess all the values and features of the painting to define the corresponding approach. We must take into consideration all possible interactions between conservation phases before and during the conservation and restoration process. To avoid any incompatible reactions, all trials must be carried out on small areas with constant monitoring of the changes to the surface. The intention is to use materials and techniques that are compatible with the original with only a slight difference in execution to distinguish intervention from the original.

The northern wall in Mala Ligojna was completely uncovered and consolidated in the first phase of the conservation-restoration intervention to prevent any further loss of the painting. Consolidation tests directed us to the only acceptable approach, which is to use the same material as had been used for the original. Even when we faced problems, in this case a difficult removal of one of the secondary layers of whitewash, we needed to keep searching for new ways to resolve the problem and gain more understanding of the painting. There were many interactions between the paint layer and the plaster over the past 500 years. The experience of resolving what, at first, was a big issue is extremely valuable and will guide our minds to more possibilities and ideas regarding the problematics.

Although the paint layer in Mala Ligojna is preserved only in large fragments, with some knowledge and good perception of a conservator-restorer's eye, the fragments can be connected into a unified whole that will respect the historical and aesthetic value.

There are still many features of the painting to assess, but the basic conclusions concerning its creation have been drawn. We are facing a 500-year-old *secco* wall painting in a small local church in a small country in

the south of Europe. We have uncovered a new historical era of the church and information about its interior alterations in the past.

The painting was created in the late Gothic era with a freedom of style. The artist showed his best features in the formation and the freedom of his own perception. We can still compare all the similarities but must consider individual tendencies and the artist's personal style. His paintings were getting more and more free, with fewer boundaries and more personal touches. He was not as strict in the composition and formation as other artists. Even though there are noticeable differences compared to Master Leonard's paintings, we must consider that this painting could be another of his creations.

Conservation and restoration of the painting on the northern wall is ongoing and will be finalized in 2022. A future conservation and restoration project of uncovering the painting in presbyterium will give us a more holistic view of the paintings and their artists.

Comparison of the paintings and their features was done through my own research and will be a future matter to discuss with professionals in the field.

### Acknowledgment

The project for the conservation and restoration of a medieval wall painting in Mala Ligojna is being carried out for my master's thesis within the Academy of Arts in Ljubljana. I would like to thank my mentors Doc. Dr. Blaž Šeme and conservation and restoration consultant Ajda Mladenović for their professional guidance.

Received ——— 22 12 2021

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Santrauka

## Viduramžių sienų tapybos Mala Ligoinos Šv. Leonardo bažnyčioje konservavimo ir restauravimo iššūkiai ir autorystės klausimas

Eva Marija Fras

*Reikšminiai žodžiai:* gotikinė sienų tapyba, konservavimas ir restauravimas, antrinis dengimas, sutvirtinimas, autorystė.

Mažame kaimelyje Mala Ligoinoje netoli Liublianos esančioje Šv. Leonardo bažnyčioje po daugybe antrinių dangų buvo aptikta maždaug 500 metų senumo *secco* sienų tapybos fragmentų. 2020 m. pradėtas projektas, pašalinus antrinių dangų sluoksnius visoje šiaurinėje sienoje, susidūrė su tam tikrais iššūkiais. Pirmoji antrinė danga buvo tirpi vandenyje, dažų sluoksnis taip pat tirpo, todėl buvo išbandyti įvairūs būdai kitam sluoksniui pašalinti. Jį atidengus atsivėrė gotikinė sienų tapyba, vaizduojanti Kelionės ir Trijų Karalių sceną. Dėl perteklinės drėgmės sienoje tapyba vidurinėje zonoje buvo gerokai apgadinta, o apatinėse zonose beveik visiškai nunykusi. Išnagrinėtos skirtingų medžiagų galimybės sutvirtinti ir stabilizuoti išlikusį *intonaco* ir dažų sluoksnį. Buvo atlikti rišiklio, pigmentų ir grunto tyrimai, kurie padiktavo specifinės tvirtinimo sistemos naudojimą.

Drauge buvo vykdomi paveikslo autorystės tyrimai. Kadangi yra žinoma keletas skirtingų gotikinių ornamentų piešinių, buvo svarbu ištyrinėti brokato ir pakraščių ornamentus, kurie galėjo padėti tiksliau identifikuoti menininkus ar dirbtuves. Išnagrinėta piešinio perkėlimo ant sienos sistema ir identifikuoti pjūviai. Tyrime taip pat apžvelgiami naudoti pigmentai ir rišiklis.

Mala Ligoinos sienų tapybos motyvai turi panašumų su kai kurių gerai žinomų gotikos tapytojų, žinias perėmusių iš tarptautinio gotikos stiliaus meistrų, kūryba. Tokie tyrimai padeda atskleisti istorinius bažnyčių statybos etapus ir plečia žinias apie Slovėnijos viduramžių sienų tapybą.

Pastarųjų kelerių metų mano mokslinių tyrimų kryptis – sienų tapyba, konkrečiau – sudėtinių druskų ir dangų šalinimo problema. Mano magistro darbo tema – gotikinė sienų tapyba Mala Ligojos kaime, kuriame yra vykdoma visa konservavimo ir restauravimo procedūra.