

Research of Transylvanian Medieval Murals: Mugeni, Ghelița, Chilieni, Dârlos, Ighișu Nou, Mălâncrav.

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Abstract

Surveys, research regarding monuments are more and more frequent throughout Transylvania. Beforehand there were mostly studies of archaeology and history of art. In most of the cases the inventory of the cultural values of several dioceses, in some case not even that. For some time scholars concerned with the protection of monuments have recommended that first of all there should be an assessment, description of the works of art belonging to cultural heritage, and if it is necessary the interventions needed to preserve these monuments.

Thorough, detailed research is scarce. This can be explained by the fact that specialists did not have the necessary material means to do so. In the majority of the cases, larger renovation works or creating a restoration plan the necessary funds could be obtained through financing projects.

This thesis attempts a detailed and though presentation of the mural paintings of 6 Transylvanian churches. The motivation for this topic can be found in the research topic of thesis from 2007. The latter dealt with the research of the Medieval murals, their techniques from four churches of the Szeklerland. There were no earlier studies concerning with the Transylvanian Medieval mural paintings.

This doctoral thesis intends to continue this research. The study comprises not only works of art in the Szeklerland (Mugeni, Chilieni, Ghelița), but also works of art from the Szeklerland. Within this the Medieval murals of the churches belonging to the Saxon Lutheran deanery of Mediaș (Dârlos, Ighișul Nou, Mălâncrav).

The selection of the murals from these churches was made according to the common elements they share or based on their iconography or murals belonging/accredited to the same workshop/artist.

1.Mugeni(Bögöz, Begesen)

The murals of the church were discovered during the 1865 repairs, when on the Northern wall of the nave they created a new window. Then in 1898 following the approval of the Church council of Mugeni, Adolf Csehély has exposed the lowermost register of the mural. The National Committee of Monuments invited József Huszka and Adolf Csehély to expose the wall paintings. During this work there were numerous photos, aquarelle tracing paper copies made. Shortly after the murals were explored they were whitewashed. Through the years new fragments of the painting were uncovered, but the complete exploration and

conservation of the mural was done only in 2012. The professionally challenging works has been done by the team of Imago Picta SRL under the supervision of restorers Lóránd Kiss and Péter Pál.

The paintings were made in three registers one under the other. In the uppermost register there is the representation of St. Ladislaus' legend, below this the legend of St. Margaret and in the lowermost register there is a large painting of the Last Judgment, as well as of St. Dorothea with a nimbed child, the veil of Veronica, St. Helena and St. Nicholas.

Based on the observation at the site and on the microscopic examinations it can be said about the internal murals of the nave that according to their style and technique the two upper registers have been painted in the same time and earlier than the paintings of the lower register. The technique used was the fresco, with fresco and fresco secco binding. The plastering was in both cases smoothed, on this the picture field was marked with red paint applied with a brush. First the artist painted the background, then the architectural elements and only then the figures. The fact that several artists have worked on this is especially obvious when observing the faces of the figures and their garments. The images of St. Ladislaus' legend clearly show that the figure of St. Ladislaus was painted with more attention, however throughout the cycle of the mural he is not uniform, neither his face, nor his clothes.

Similarly, the legend of St. Margret was also painted by more than one hand. There are significant differences in the way the faces were painted. While on the starting scene the faces are painted with a simple light colour and darker contours around them, towards the end of the story these become more and more elaborate.

Regarding the two upper registers it can be said that they are light in colour, this is due to the whitewash and limestone grist. The strength of the plaster is given by the limestone pieces as well as by the brick grist. The study of pigments show that in the two upper registers the red is painted with red ochre, the pink with lime and red ochre, the yellow with ochre, the grey with vegetal coal, while the whites with lime.

The figures, the structure of the composition resemble 14th century paintings. The figures are elongated, disproportionate, stylised. Their faces are schematic with no real feelings. The hands are simplified, and the movements are rigid. The background and setting are neutral. The ground is marked by wavy lines or just by a separation band. The first role of the strong and decorative contours is to accentuate. The colours are unnatural. Group compositions are integrative, figures are depicted one behind the other. Representation of space is unsuccessful.

The murals of the last register are different from the other two both in style and technique. The figures are more emphasised and are more elaborate. Their faces are less schematic and more expressive. In their proportions the figures are more human. One can observe the first signs of naturalistic representation. The creases of their clothes are more stressed, the line breaks are more dynamic. In order to suggest luxury and beauty the fabrics are decorated with ornamental motifs. The figures appear one beside the other instead of

behind each other. Here too there are attempts to represent space, the results being more impressive than on the other two registers.

By a comparison of the stereomicroscopic pictures it is clear that the plaster of the two upper registers is different from that of the lower register, both in terms of colour and composition. The results of the silt fraction analysis also shows that while the colour of the upper register's plaster is almost white, the colour of the lower one is rather dark, ferriferous. The use of colours for the painting was also parsimonious, but in more shades and diversified, using ochre, red ochre, lime and vegetal coal.

The results of the microscopic examinations showed that the plaster of the interior murals' upper register concur with the plaster of the southern side and that found on the counterforts. This proves that the church tower is early and must have existed before the suspected time of the interior murals' painting.

The composition of the lower register's plaster as well as the structure of its cross sections is the same with that of the scene above the southern entrance.

According to the results of the research the mural of the two upper registers and the painted parts on the southern side of the tower and were probably painted in the 14th century. The scenes of the Last Judgment and of the Madonna Enthroned above the portico have been painted towards the first quarter of the 1400s.

2.Ghelița (Gelence, Gälänz)

These paintings have been presented for the first time by Géza Nagy in the 14th July 1882 issue of the *Nemere* magazine. Then together with József Huszka they explored the murals and made aquarelle copies.

On the northern wall of the church's nave there are murals painted in three registers, one above the other. Only a few details have survived on the bottom section.

All the murals of the church from Ghelița have been made with the fresco technique, but in many cases only secco bindings have been realized.

The composition of the scenes has been outlined with ochre and then in both registers they painted the background, there are significant differences in the painting of the faces, even within a register. In case of the legend of St. Ladislaus, where the scenes are not separated by frames, the painting of the faces is relatively the same. The differences can be observed in the details. On the dark rose colour base, the lighter parts are applied as masks, then the facial flushing as a red circle. The contours have been painted with dark brown. The eyebrows semicircle shaped. The highlighting of the light details and the semicircle-shaped eyebrows are characteristics that can be found only until the scene of the Exodus. Starting with the Battle only the red circular facial flushing is present. The arches of the eyebrows are broken, while the contours are the same red as the facial flushing. The colour of their eyes is not present, the base colour of the face is dominant. Either the eyes have not been painted or their colour disappeared. The same are characteristics can be observed on the scenes of the Passion, Last Supper and the Washing of the Feet, scenes that run parallel below.

In the upper register after the daily division, the painting style of the faces changed. Within the lower scenes the daily division did not influence this, the limit is between the scenes of the Last Supper and the Washing of the Feet.

In the scene of the legend of St. Ladislaus, after the daily division the light parts are applied in thin layers on the base colour of the faces. The transition from dark to light colours is accentuated. The faces seem to present more details, showing a meticulous workmanship. The contours are again dark brown.

On each scene the St. Ladislaus' nimbus is drawn with the help of a tool. The central point where the compass was applied can be found everywhere. In spite of the fact that on each scene of the Passion the nimbuses are regular circles, the central point of the compass can be found only on the starting scene.

A unified method of painting is not characteristic to the scenes of the Passion. The painting of the faces is different on almost every scene. On one we can find refined details, while on others the mask-like rough painting style is dominant. The figures are stylised and elongated. The light and shadow effects are minimal. The physiognomy and movement of the figures are schematic. The horses of the St. Ladislaus legend are disproportionate. They have long legs, short necks and small heads. The drapery and the creases of the clothes follow the movements of the figures and the lines of the contours have a significant role.

Spatial effect can be slightly observed only on those parts where the figures are arranged one behind another. The perspective is not improved by the shapes of the architectural representations either. The background is flat, the representation indicative.

The literature refers to these paintings as works of art where the artist combined byzantine conventions with western elements. All these statements are only true regarding the iconography of the paintings, as the techniques are not characteristic to the byzantine recipes. Neither is the way the plaster was applied, nor its composition, as it should contain a lot of lime and fibrous vegetal materials. Examination done with microscope shows that despite the fact that the material contains pieces of brick to give it extra strength, there are no traces of fibrous vegetal materials.

The microscopic examinations show that on the northern wall all three registers have the same base. This proves that all the paintings from the three registers of the northern wall have been painted in the same period. The southern wall also shows murals organised in three register, out of these the paintings of the upper register have partially survived, as well as the lower one. Based on the microscopic and on-site examinations it is clear that the paintings of the southern wall are different from those on the northern wall, both in composition of the base and in their technique.

Contrary to what literature asserts, the painted parts have not been directly applied to the plaster, but on a layer of whitewash that cover the whole surface of the plaster on which the scenes are painted. On this they traced the composition. The greatest difference between the two murals is in their painting technique. The application of the paint is glazed, aquarelle-like. The painting started with lighter colours and progressed towards darker ones. In creating

the lighter surfaces no lime was mixed with the pigments, they rather let the light base to prevail. The darker parts were obtained by applying as many coats as necessary to get the desired darkness. The order of painting is hard to follow. Based on some worn out surfaces it seems that the artist did not prefer neither the background, nor the figures, as if he was working simultaneously on the whole surface. The paint was applied in the same time until it was finished.

The composition of the plaster of the three registers is the same. So is the method of painting, thus it can be asserted that the southern murals are from the same period. As far as the representation is concerned, the figures are less stylised. They are disproportionate, slender but not elongated like on the northern wall. The lines of the creases of the clothes are soft.

On the northern wall the paintings have also been arranged into three registers. The lower part is almost completely lost. What is the most noticeable is the fact that compared to the rest of the nave's paintings, these have a pronounced graphic element. According to the description analysed by Jékely there was a red under-painting, this is however a false statement. Since the details of the scenes have been drawn with black, coal, on the layer of whitewash. The lime layer mentioned by Jékely as being uniform is not present everywhere, which is probably connected to the light painting of the background. The whole surface of composition was not necessarily painted white, rather than the lighter background was painted first onto which the figures have been then applied. The samples of cross-section grindings taken from several points do not always contain lime. In some cases the painting was applied directly on the plaster.

The paintings of the upper register are significantly worn, thus it is hard to gather data regarding the technique used. Based on microscopic and on-site inspection it is rather a fresco technique with fresco binding.

In conclusion it can be said that all three paintings of the nave were created in different periods of time and by different workshops. It became clear and it is backed by examination results, the fact that all three registers of a given wall have been created by the same group in the same period of time.

Above the southern entrance, the plaster is different from that of the interior murals. It contains a significant amount of lime. However the colours are worn out. The plaster is not similar to any of the interior plasters, thus it cannot be connected to any of their timeframes.

In a similar fashion, the plaster of the St. Emeric scene on the outer side of the nave is not similar to either of the plaster of the interior paintings.

3. Chilieni (Sepsikilyén, Kilön)

The murals of the church have been discovered for the first time in 1882 and then in 1885 József Huszka explored and copied these paintings. During the years the church has

seen small and also significant repair works, but the actual exploration of the murals did not begin until 2004.

The outside and inside paintings of the church have been executed with fresco technique, also sowing secco binding in some places.

Inside the church, all three sides are covered with murals in three registers. The Last Judgment on the Southern wall, the first cycle of the Passion below it, as well as the suspected scene of Mary with child that was the object of this research, have been painted in the same time and are the work of the same workshop.

The St. Ladislaus legend that begins in the upper register of the western side and continues through the northern wall and the scenes of the Passion below it were made in the same period by the same master.

The process of painting these murals was the following: after applying the plaster the surface was smoothed with a spatula of a few centimetres wide. Generally in a horizontal and slightly curved line as the movement of the arm allowed it. One of the most important characteristics of the wall paintings is the fact that the plaster was smoothed. In case of similarly processed surface one can assume that the artist was the same.

The painting areas were marked with a twine, as there are no traces of paint, the twine was probably not impregnated with paint.

The contours of the nimbuses were scratched in beforehand. The nimbuses were scratched into the wet plaster with a pair of compasses. The *central* point of the compass can be found in case of each nimbus, it was not filled in.

In case of the Last Judgment scene, in the middle of mandorla that contains Christ's enthroned figure a cross was drawn. According to the directions of the tracks it was drawn from the top to the bottom and from left to right. The lines were drawn with the help of a ruler. The double contour of the mandorla and the semi-arches in region of Jesus's abdomen and below his feet, were also scratched into the plaster.

The order of painting the scenes was as follows. The composition was traced with a brush and ochre colour, then on the background the grey sky, the ochre ground, the architectural elements, the decorative frame. Then the painting of the figures followed. Here the order began with the nimbuses and faces, then the head and limbs were painted. The next step was to paint the clothing of the figures and then the smaller decorative details.

One feature for the faces was the light base that held the shadows and circular facial flushing. Highlights were not painted, instead the light primary colour of the face was let to prevail. The lines of the mouth, eyes and face are marked with a dark contour. There are not much signs of different painters, as the majority of the figures are similar, without character and throughout the storylines the method of painting does not change really. One small difference might be the fact that the flushing of the faces is at times circular and sometimes it traces the lines of the cheekbone.

There are a few rudimentary experiments to create the sense of space, but one cannot speak about perspective representation. Most of the scenes has a simple plain background. The architectural elements are mostly flat and decorative. A slight attempt can be observed at the representation of the fortress of Heaven.

Examination with microscope shows that the colouring of the figural representations of the southern, western and northern walls registers, as well as that of the below lambrequin were done in the same period.

Both on the southern and northern wall there are colourings of which origins are questionable. On the southern wall, between the starting scene of the Passion and the Last Supper there is a representation of Mary with child. Due to the heavily worn coat of paint, from a stylistic point of view this mural is hard to compare with the rest. The date when this part was painted is also questionable, as the descriptions that can be found in the literature attribute it to a later period and thus it probably impaired the earlier scene of the Triumphal entry. Grazing light photography contradicts this. The boundaries of the Passion scene cycle plaster overlap the painted surfaces of the Mary representation, which indicates that it was created earlier than the murals on its sides.

Microscopic examinations performed so far, show that the plaster of Mary with the child contains volcanic sand, just as the Passion scene does. The cross-section grinding of the samples taken from both plasters shows a strong similarity. Based on this it would be right to assume that they belong together. Since there was no complete examination of the plaster carried out, this hypothesis needs further examinations.

Grazing-light photography did not show pronounced tool traces on this scene contrary to the scene of the Passion. Since the plaster of the scenes of the Passion is very grooved with trails of the spatula, this fact makes improbable that the two were done in the same period. Another question mark is the fact that on the southern side there are no painted surfaces that have such a wear.

On the northern side, as a continuation of the Passion scene and on a separate surface of plaster there are the figures of two healer saints, and the figure of a saint under the Heavens scene are separated from the rest of the murals from the interior of the church.

These plaster surfaces are not grooved by traces of the tools. On both sides the limits of the plaster extend into the painted plaster of the upper registers. This means that they were carried out in an earlier period than those on the upper register.

On both sides the nimbuses of the saints have been applied on the wet plaster, creating depressions and elevations. The double contour of the nimbuses was applied with a sharp compass. The contour of the heads and the edges of the nimbuses have been engraved later.

The use of monochrome colour and the type of composition are the same as those of the interior murals, while the painting technique is somewhat distinct. On the light pink surface of the face there are strong shadows applied in a broom-like manner. The lime highlights are applied in the same linear manner.

Microscopic examination has only been done in regard of the northern mural. Based on the cross-sectional grinding the plaster of this mural is different from the rest of the paintings.

On the exterior of the church, on the southern side, the murals are so worn out and so fragmental that it is really hard to make a comparison with the interior paintings.

The difference between the external and internal paintings is that the external murals have been applied not directly on the plaster but on a layer of whitewash. The cross-section grinding of the scene that shows a standing saint is the same as that of the three interior registers' plaster (*Final Judgement, the Legend of St. Ladislaus, the Passion* and the drapery motifs). They used the same volcanic sand.

The grooves nimbus of the mural that covers the tower is similar to that of the two healing saints and the saint with basket that faces the other two. As there were no samples taken from this surface, there was no possibility to compare the plasters.

The results of this research confirm the hypothesis formulated in the literature, i.e. the murals show the characteristics of the last decades of the 14th century, both regarding style and painting technique.

4. Dârlos (Darlac, Durles)

The church's sanctuary is covered by murals. Their first written assessment comes from French writer August de Gerando (1819-1848) in 1845. Soon after the murals have been whitewashed. In 1975, in the chambers of the sanctuary the murals of the two saint kings, St. Ladislaus and St. Stephen, were accidentally discovered. From 2009 to 2011 led Lóránd Kiss, the Imago Picta SRL team revealed the mural by sections and preserved most of the murals of the sanctuary.

Comparing the art history descriptions and the results of the examinations the following conclusions can be drawn. The mural paintings of the church have been created with the fresco technique, while the azurite from within the sanctuary was applied by secco.

The paintings from the interior of the church's sanctuary were painted on a 1:2 lime-sand plaster. This is much closer to the East-European finishing mortar than to the Byzantine recipes. In the same time it shows some common elements such as brick dust, hemp.

The order and method of painting rather matches the post-Byzantine descriptions than those known in Italy. They started with the dark base and moved towards the lighter colours. During the painting of the faces there are no traces of the Italian verdaccio. Each figure's face and hands were given a unified ochre yellow base. The shadows of the faces were painted with dark brown, just as the contours, and then the lighter parts have been created with lime. There is no cinnabar mixed with lime on the faces as it is recommended by the Tipik and Hermeneia painting booklets recipes.

As it was mentioned earlier, the faces of the more important figures one can observe a more precise and detailed method of painting the icons. Just as in the case of the portraits of the exterior murals. As far as the clothing is concerned one can observe a drawing-like quality just as in case of the monasteries of Moldova. The contours, creases of the clothes are applied after the local colours have been painted, then the highlighted parts are created with a strong white.

The observations show that some of the figures have been painted by the master of the workshop. There is somewhat a ranking of the figures, that is given by the details of their paintings. E.g. on the southern side the portrait of the Enthroned Jesus is the most detailed, then come the faces of the apostles, however here we cannot observe the subtle nuances of the detailed workmanship.

This type of ranking can be observed on the southern side as well. St. Helena and Constantine and the figures of the two saints from the window are given a higher level of detail.

The paintings from the outer wall of the sanctuary are similar to those from the inside, but in the same time there are also differences. In contrast with the interior paintings, the outer ones are painted on a double layer plaster, the one underneath being more granular, while top one is smooth. The proportion of the filler and binding materials in the outer plaster (intonaco) is the same with that of the interior plaster. In the same time the plaster also contains hydraulic parts.

The method of painting is the same as the one used on the internal murals. On the outer façade they did not use any azurite during the painting of the background, they exclusively used a mix of lime and vegetal coal.

The observations and examinations suggest that the sanctuary's inner and outer murals have been carried out by the same workshop, and it is highly probable that they were painted in the same period as well.

In the lunette of the western gate, the partially survived scene was painted on a plaster with one layer. Its composition is different from the rest of the church's murals. It has much more lime than the rest. Christ's nimbus is protruding, the rays around his head are embossed into the plaster, giving a plastic form to the nimbus. Such an execution cannot be observed on the outer or on the inner murals. There are only a few details preserved that are hard to interpret. These were probably not carried out in the same period, nor by a single workshop.

The materials and their use (the proportion of the filler and binding materials of the plaster, the presence of lime conglomerates that suggest a binding material made with dry lime, plaster limits that match the levels of the scaffoldings) prove that its origins are medieval, while its expression tends towards the Renaissance (early trials of perspective etc.), thus similarly to Vasile Drăguț we would estimate the period of its birth towards the first half of the 16th century.

In 2013, Gábor Gaylhoffer-Kovács on the scene depicting two kings from within the sanctuary, found an etched in date that suggest 1520, only the first three digits can be read. This confirms the earlier presumption regarding the dating of the mural.

5. Ighișu Nou (Szászivánfalva, Ebesdref)

The murals of the church have been exposed and preserved in 2014.

Mural painting survived on the northern side of the nave, on the nave-side of the triumphal arch, on the walls and ceiling of the sanctuary. When the murals were covered their surfaces were slightly hammered so the covering paint would better adhere. These traces densely cover the surface of the murals.

The technique used was a mixed one. The majority of the paintings have been executed in fresco, some of the colours that are not alkali-resistant were applied with the secco technique using organic binding materials.

The whole surface of the northern side of the nave was once covered with murals. Most of these are visible today as well. The arrangement is in four registers. The workflow was from top to bottom and from left to right.

The applying of the plaster, the smoothing, the order of painting are the same in each of the four registers. The decorative frames were painted on separate plaster bases.

In the wet plaster they engraved the horizontal and vertical structural lines of the buildings, as well as the vertical edges of the two decorative frames.

The sketch of the composition was drawn with ochre yellow and its reddish shades. The order of the painting began with the colour of the background, then it was followed by the painting of the faces and finally the painting of the clothing and the smaller decorative elements.

The faces were painted as follows. The sketch of the face was done with ochre yellow. The most characteristic feature are the circles around the eyes. This structural line can be found on other places like the tip of the nose. The base of the face is light, the darkening begins with applying the shadows. Lastly the parts they wanted to emphasise were given black contours. Most of the faces have been painted with this technique, but there are a few exceptions. The differences are in the details. One of the latter types is a female face, but there are others as well. The eyelids have eyelashes, the lines of the nose and eyebrows are delicate, graceful. On the western side the only figure whose eyebrows have visible lines of hairs is emperor Maxentius in the second scene of St. Margaret's legend.

In case of the second type portrait the nose is thicker, the shadows of the face darken the whole surface. On one the shadows are ochre and its lighter versions, on the other the shadows are with grey and different nuances of red. The lines of the eyes are rather clumsy and heavy-handed.

The creation of the nimbuses is similar. The double contour of the nimbus was etched into the painted and dry plaster. Due to the damaged surface the central point of the compass is not visible. On the surface of the nimbus, with a spoon-like tool they carved radiant indentations. Then the whole surface was covered with metal plates. The nimbuses are encompassed with painted double lines. The inner line was painted with azurite, while the outer one is bright red, painted with minium.

Several surfaces of the murals have been covered with metal plates. The contours of which are usually engraved into the surface. Such examples would be the armoured clothing of St. Ladislaus and the crowns. The wedge that clamps the cape, the square shaped decorations on the belts, the buttons on the sleeves and on the front of the clothing are all plated with metal. Based on the cross-section grindings, on a thick, presumably tinfoil they pasted gold leaves.

Traces of discoloration can be observed in more than one places, e.g. on the decoration strip with clovers. The row of clover patterns that is running along the centre of the strip is grey, blue and green. The examinations showed that the clovers have been painted with azurite.

The grey skies that can be seen in the background of the scenes are without azurite. The colour of the skies has been realised with a mix of vegetal coal and lime. The yellow colours are made with ochre, the reds with red ochre and minium, while the rest of the hues are created by mixing the mentioned colours.

On the nave-side of the triumphal arch there are the images of a large scene of the Last Supper. Three registers have survived of these murals. The order and the method of painting is the same as in case of the murals of the nave.

On one part of the triumphal arch there is a representation of St. Oswald's face, it has been painted with the same details as that of the angels' from the nave-side of the arch.

The vault of the sanctuary and its sidewalls are also decorated with wall paintings. Few have survived. The order, method and style of the paintings that remained on the vault and the sidewalls, are the same as those of the nave and triumphal arch.

The southern sidewall of the sanctuary presents a Crucifixion drawn up with coal, that could have been the sketch of the painting.

As far as the style of the painting is concerned, one can assert that the figures are not lined up in front of a flat background, in stead they tried to place them in space, more or less successfully. Except for the images of the arch and the sanctuary that have flat backgrounds, the scenes of the nave and the figures are set in a natural background or in urban background. The depth of field is emphasised by the perspective used on the architectural elements. The figures are one behind the other, rather than side by side.

The human figures are elongated, anatomically incorrect, disproportionate. In the scene of St. Ladislaus' legend the horse is disproportionately smaller compared to its rider.

The shaping of the figures is not schematic. Both their faces and bodies reflect their feelings. The naturalistic painting is characteristic to both the figures and the vegetation.

The images that cover the walls of the church can be dated to the turn of the 14th century, this is underlined both by the style and technique.

6. Mălâncrav (Almakerék, Malmkrog)

Murals are to be found on the vault and on the sidewalls of the sanctuary.

The surface has never been covered with whitewash. The images are painted on a double layered plaster. The first is a greyish, coarse grained plaster (1-2 cm thick), onto which a coal sketch was made. This was followed by a fine-grain base for the painting (intonaco), which compared to the former plaster is significantly thinner.

On the vault each wedge is made up of two plaster sections, as well as of a plaster of the decorative ribbon that encompasses the image field. On the ridges there is a thin layer of the base plaster. On the sidewalls the images are painted in four registers. The decorative frames painted below the vault wedges and the horizontal frames are each applied on separate plaster. Based on the overlapping of the plasters' edges it is clear that the painting was done from left to right. On the sidewalls the direction was from left to right and from top to bottom. Before painting the plasters have been smoothed out.

The painting was preceded by etchings. The edges of the vertical frames, the structural lines of the buildings and the important elements of the composition have been traced in the wet plaster. Most of the etched lines are straight, made without aiding tools, traced along a ruler. There are etchings that during the painting were not taken into consideration and were painted over, or in some cases the painting does not entirely follow the etched lines.

The outlines of the compositions have been made with ochre and its red hues. Light microscopy shows that they used natural ochre.

The faces have character, a specific feature is that the lines of the eyebrows and of the nose are joined, the bridge of the nose is wide, the circular lines around the eyes can sometimes be found on the tip of the nose as well. The presence of this type of face that was not seen before suggests that within a workshop more than one artists have worked here. The face is depressed, the eyes are small, the eyebrows are frowning, the look is angry, the line of the nose is slightly curved, the tip of the nose is pointed, the bridge of the nose and the nostrils are thin.

There are differences of painting among the same type of faces. Most of the faces have a light ground colour, that was created by mixing ochre and lime. The way the ground colour was applied is also varied. In some places it was applied as a thick, pasty layer, in other parts it is very thin almost translucent. On the images taken of the faces that were painted with a thick layer, the different highlight colours can be seen on the face, nose, forehead etc. As the colour and tone of the highlights are similar to the colour of the base, on

normal photographs it cannot even be observed. The shadows of the faces have been painted with ochre and its hues.

Another category of painting the faces is when the base colour is not light but rather dark. These were created with a mix of lime and red ochre. The highlights have a great contrast with the dark base. They were painted with lime. This method of painting can be seen on the half-figures found on the sidewalls of the sanctuary.

On the background the blue sky was painted in two parts. The wet plaster was covered with a layer of paint made of vegetal coal and lime and after it dried a layer of azurite was applied.

The gold leaves have been applied on some parts in the last phase of the painting. The nimbuses, decorations of clothes, stars in the skies are covered with metal plates. Microscopic and other examinations have proved that the golden leaves were applied on a base tinfoil. As glue they used an organic binding material (oil) that was beforehand treated with lead siccative.

To paint the murals they used reds, mainly red ochre and its shades, as well as minium and cinnabar. The minium was used clean and also mixed with cinnabar. The highlights were created with ceruse and lime, like on the dove of the Annunciation, which today is black. The greens are created with malachite with spherulite.

There is a great deal of discoloration on the wall paintings. Most of this is caused by the water-soluble salts contained in the walls. Most of the discoloration has happened in case of pigments that contain copper and lead. The elements are set in architectural or in natural settings. The figures are mostly one behind the other. Depth of space is rudimentary. Perspective is to be observed mostly in how the architectural elements were created. In many cases with little success.

Based on their style the paintings of the sanctuary bear the signs of international Gothic. The figures are elongated, strongly slenderised, the movements are graceful, their posture is in the form of a fine "S". Most of the faces have fine, soft features. Both the looks and the posture of the figures reflect their feelings. Based on the technique and the style, these murals can be dated to the first half of the 15th century.

Comparing murals from Szeklerland with those from the Saxon Lands, one of the most prominent differences is observed in the use of pigments. In the churches from Szeklerland they used mostly cheap ground colours. The examinations of the plasters and pigments showed that expensive pigments have also not been used in murals that were not the object of this research. In contrast the Medieval murals from the Saxon Lands expensive pigments were extensively used. In larger quantities and in more variations: highly pure azurite, malachite, cinnabar.

The pigments used clearly reflect the economic situation of Transylvania's different regions.

The research was carried out with the hope that the observation methods used on-site would benefit the specialists. The innovative side of the research is mostly in the examination methods that can be carried out on-site, without greatly complex instruments that do not require high levels of qualifications.

Research of Transylvanian Medieval Murals in the Szeklerland and Saxon Lands: Mugeni, Ghelinta, Chilieni, Dârlos, Ighişu-Nou, Mălâncrav.

Synthesis

Mugeni(Bögöz, Begesen)

The results of the microscopic examinations showed that the plaster of the interior murals' upper register concur with the plaster of the southern side and that found on the counterforts. This proves that the church tower is early and must have existed before the suspected time of the interior murals' painting.

The composition of the lower register's plaster as well as the structure of its cross sections is the same with that of the scene above the southern entrance.

According to the results of the research the mural of the two upper registers and the painted parts on the southern side of the tower and were probably painted in the 14th century. The scenes of the Last Judgment and of the Madonna Enthroned above the portico have been painted towards the first quarter of the 1400s.

2. Ghelinta (Gelence, Gälänz)

In conclusion it can be said that all three paintings of the nave were created in different periods of time and by different workshops. It became clear and it is backed by examination results, the fact that all three registers of a given wall have been created by the same group in the same period of time.

Above the southern entrance, the plaster is different from that of the interior murals. It contains a significant amount of lime. However the colours are worn out. The plaster is not similar to any of the interior plasters, thus it cannot be connected to any of their timeframes.

3. Chilieni (Sepsikilyén, Kilön)

The results of this research confirm the hypothesis formulated in the literature, i.e. the murals show the characteristics of the last decades of the 14th century, both regarding style and painting technique.

4. Dârlos (Darlac, Durles)

The observations and examinations suggest that the sanctuary's inner and outer murals have been carried out by the same workshop, and it is highly probable that they were painted in the same period as well.

In the lunette of the western gate, the partially survived scene was probably not carried out in the same period, nor by a single workshop.

The materials and their use (the proportion of the filler and binding materials of the plaster, the presence of lime conglomerates that suggest a binding material made with dry lime, plaster limits that match the levels of the scaffoldings) prove that its origins are medieval, while its expression tends towards the Renaissance (early trials of perspective etc.), thus similarly to Vasile Drăguț we would estimate the period of its birth towards the first half of the 16th century.

In 2013, Gábor Gaylhoffer-Kovács on the scene depicting two kings from within the sanctuary, found an etched in date that suggest 1520, only the first three digits can be read. This confirms the earlier presumption regarding the dating of the mural.

5. Ighișu Nou (Szászivánfalva, Ebesdref)

The style of the paintings are concerned, one can assert that the figures are not lined up in front of a flat background, in stead they tried to place them in space, more or less successfully. Except for the images of the arch and the sanctuary that have flat backgrounds, the scenes of the nave and the figures are set in a natural background or in urban background. The depth of field is emphasised by the perspective used on the architectural elements. The figures are one behind the other, rather than side by side.

The human figures are elongated, anatomically incorrect, disproportionate. In the scene of St. Ladislaus' legend the horse is disproportionately smaller compared to its rider.

The shaping of the figures is not schematic. Both their faces and bodies reflect their feelings. The naturalistic painting is characteristic to both the figures and the vegetation.

The images that cover the walls of the church can be dated to the turn of the 14th century, this is underlined both by the style and technique.

6. Mălâncrav (Almakerék, Malmkrog)

Based on their style and technique the paintings of the sanctuary bear the signs of international Gothic. The figures are elongated, strongly slenderised, the movements are graceful, their posture is in the form of a fine "S". Most of the faces have fine, soft features. Both the looks and the posture of the figures reflect their feelings. Based on the technique and the style, these murals can be dated to the first half of the 15th century.

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