Reverse Paintings on Glass in Slovenia

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Abstract

The article presents a short insight into the source of reverse glass paintings of the eighteenth and nineteenth centuries in the territory of Slovenia. The painting technique is described, based on literary sources and observations of the author. The research is based on the conservation and restoration of thirty paintings housed in the Goriški and Tolminski Museums, with description of observed damage and analyses of colour layers.

Historical Background

Paintings on glass plates were a favourite embellishment of rural homes until the first half of the twentieth century in Slovenia, especially in the Gorenjska and Štajerska region as well as the Tolmin part of the Primorska region. On these decorative, brightly coloured pictures, religious motifs are depicted with images of saints, biblical stories and scenes from the lives of Christ and the Virgin Mary. Sometimes the names of saints appear on a light background at the bottom section of the picture, while on the upper section one finds the typical rich flower-pattern decoration.

The peculiarity of these pictures on glass is that they are painted on the back side of a glass plate, so that the glass acts both as the support to the paint layer as well as a protective cover. The method of painting is adapted to this and is carried out in reverse order as compared to classical painting. One starts with the contours and details while larger colour surfaces and the background are applied at the end.

Paintings on glass panels were being brought to Slovenia from different pilgrimage centres and routes, and were also sold by peddlers. Most of the paintings originate from well known centres in Bohemia, Bavaria and in Austria. A migration chart of consignments of paintings on glass plates from foreign centres to Slovenia was published in 1959 in the Österreichischer Volkskundatlas (Makarovič 1962). The time of their production goes back to the second half of the eighteenth century, while the majority of pictures on glass in Slovene collections belong to the first half of the nineteenth century (Makarovič 1981).

In the Goriška region the workshop for painting of glass was situated in the neighbourhood of the Trebuša-Čepovan glass works and its work is mentioned in the literature by R. Mario Cossar (1926).
The study of paintings on glass plates in Slovenia has only been carried out by few researchers. They especially tried to recognize the works of domestic or local masters and managed to confirm the existence of workshops for the production of paintings on glass in different locations in Slovene territory.

In his article on folk pictures on glass plates, Maksim Gaspari (1939) investigated both the art historical aspects as well as the technical and technological characteristics of reverse paintings on glass. Being a painter and restorer himself, he described in great detail the technology of painting. When the question arose as to whether he could distinguish a genuine work of Slovenian production from an import, his opinion was that our pictures have a more intimate touch compared with the imported paintings, although they are technically simpler and more modest. Slovene inscriptions provide a visible sign for recognition.

Dr. Gorazd Makarovič studied pictures on glass in detail in the museums of central Slovenia (the Ethnographic Museum of Slovenia and the Museums of Škofja Loka and Kranj). In a short study entitled ‘The painting of folk pictures on glass plates in Slovenia’ which was based on the work of field research groups, he disproved the hypothesis of his predecessors regarding the existence of several domestic workshops, but he confirmed with certainty the existence of the workshop in Selce (1962). That was the place where together with her father the folk painter Micka created her paintings, as the only known Slovenian artist who also produced beehive endings which are painted on wooden tables.

By comparison with the depicted motifs from imported paintings, they could also identify the work of two other unknown local painters whom they named after the characteristics of their paintings: ‘Master of clumsy drawing’ and ‘Master of small figures’. A great help in the identification for the research group were the beehive endings painted by the same artists. The beehive endings occasionally had Slovene inscriptions or could for other reasons be connected with local places. They were a popular subject for folk painters, who sometimes used the same motifs on glass.

The paintings on glass plates are difficult to date because the same forms and features of style continued throughout the nineteenth century. Dated paintings on wooden panels, made by the same artists could sometimes help with dating.

The ‘Master of Clumsy Drawing’

Most of his pictures are housed in the Ethnographic Museum of Slovenia, Ljubljana. Clumsy drawing lines and a spontaneity and relaxed style of decoration are typical of his work (Makarovič 1962).

The Selce Workshop

Typical of this workshop are smooth oval body lines. The faces have red checks almost as a rule. The contours are in a red colour. The plaits or folds of the drapery are simplified and painted with curved lines brought to a natural finish. There are blue lines on white cloth while with others the lines are a shade darker than the colour of the cloth. While analysing the style it was ascertained that the paintings are not from the hand of one master, but of one workshop. The same templates and the same colours were used by at least two painters. The comparison was based on painted beehive endings manufactured in the Selce workshop. The oldest known beehive ending is dated 1840, the latest 1890 (Makarovič 1962).
The 'Master of Small Figures'

The figures he painted were especially small compared with the usual size of the figures on glass paintings. The painter was very inventive and never copied another pattern while painting the figures. Although he used cartouches that originate from workshops in Pohorji and Sandl, he always transformed them in his own way. All the inscriptions on pictures are in the Slovenian language. As his paintings are made partly on rolled and partly on pressed glass, researchers came to the conclusion that they were made in the first half of the nineteenth century. The master probably operated in the Gorenjska region, as twenty of his works were identified in the museum collections there (Makarovič 1962).

The variety of motifs on reverse glass paintings found in Slovenian museums is very wide. There are about ninety different motifs which are not evenly distributed among the different collections. Among the most popular are the Holy Sepulchre, St. Lenart, the Virgin Mary with Jesus in various iconographic forms, the Sacred Heart, the Virgin Mary’s Heart and the Holy Trinity. The predominant provenances of the paintings in our collections are Northern Austria (mostly Sandl in Mühlviertl), Southern Bohemia (Pohorji / Buchers in Bohemian Woods), as well as some Bavarian and Tyrolean workshops (Makarovič 1962).

The Technique of Painting on Glass

Paintings on glass distinguish themselves for their simplicity and comprehensiveness. With their stylised lines, bright colours and incorporated floral motives, as well as shiny brilliant surfaces, they have a very decorative effect. The glass plates are made from blown cylinder glass, therefore they are of small dimensions. They are very thin and undulate slightly and have air bubbles and perceivable undulating lines on the surface.

Because of negative lines and the reversed order of application of the colours, painting on the reverse side of the glass is very exacting. At the same time the fact that the substrate is glass makes it possible to copy from templates on paper. Using a thin brush, first the outlines and details were drawn on the glass plate. Then the shades of the drapery and flowers as well as minor highlights were applied. After that the artist applied the coloured surfaces and finally the background. The succession of application of layered and azure colours was also important. In major workshops paintings on glass were manufactured in series.

There is not much found in the literature. In Slovenia the first person to write about it was Maksim Gaspari in 1939. The contours and the initial modelling were the most important foundation of the paintings. The folk painter drew the contours on clean, dry glass, partly modelling the object in negative, following the underlying image or template. The painter drew with a thin brush of otter and marten hair, but also with a quill pen for tempera and gouache. On top of these tempera contours, colour layers were subsequently applied using ground earth pigments in oil, which the painter had himself previously crushed, first with water and then with oil. As a medium for tempera egg white and yolk, milk, gum tragacanth, honey, ox gall and sugar were used, while for oil painting artists used varnish, essential oils, siccatives and turpentine. Gaspari’s findings were partly supported by his own experience, because he was a painter and had himself produced some paintings on glass. He also mentions a modest colour palette, composed mostly of red vermillion, ultramarine, ochre in different shades, green, white and black, while Makarovič adds to vermillion carmine and Venetian red varnish. He does not mention ultramarine but Berlin blue (Prussian blue), yellow ochre, brown and green burnt
earthen colour, lead white and soot black. He wrote that the contour lines on glass paintings were made with water colours, using gum Arabic as a medium. The successive layers are usually made in tempera, the final layer is in oil colours (Makarovič 1962). Janez Dolenc summarized the oral tradition about the work of Micka from Selce. Before she started to paint she grated or ground the necessary pigments. She transferred the pigments into pots, added some oil, probably linseed oil (Dolenc 1962).

The preliminary treatment of the glass surface is very important in glass painting, as it has to be perfectly clean and degreased, to allow a good grip of the colour layer. The cleaning was carried out with water, chalk powder and alcohol (Gaspari 1939). Instead of alcohol some authors mention the use of ammonia or benzene, mixed with lime to accelerate the cleaning. The application of a layer of ox gall is recommended before painting. A foundation layer of beaten egg white is also suggested after cleaning and the ox gall coat (Kraigher-Hozo 1991).

For the outlines and contours three colours were used on our pictures. Besides the reds, brown-reds and blacks mentioned by Gaspari and Makarovič, a dark green was also used. Painters also used reds or brown; reds for faces, hands and body parts. For the dark colours of garments, hair dresses, the schematic outlines of clouds and brown-red tree trunks they used black, while for the outlines of leaves and the stems of flowers they used a dark green colour. White colours were occasionally used in modelling for the accentuation of light.

The painting of red drapery and flowers was carried out in a different way. Before vermillion was used, the underlying modelling was applied with carmine red varnish instead of outlines. Lips and flames were also depicted with the same pigment, which has faded a lot.

Viewing the picture in cross-section it becomes clear that the colour layers on different parts of the glass panel are applied in a different way, so that on some areas they overlap, and on others there is a single layer. On the back of the picture we can see that the covering colours, such as red, blue and brown, are applied in such a way as not to reach over the previously drawn outlines, while the background and flesh colours are applied with quick strokes, also overlaying other colours, taking into account their coverage.

All these citations show that the technique of painting on glass is very complex and that the folk painters probably used a mixed technique, which still has to be investigated.

Characteristics of Different Techniques and the Latest Analyses

In the conservation and restoration of paintings on glass, the condition of the colour layer and its attachment to the support is essential. Of central importance is the use of a suitable painting technique and the strength of the medium which binds the pigments to the support. With glass paintings the use of appropriate media is even more important than in canvas paintings, or those on wooden supports. Because of the impermeability of the support, the evaporation of the binding media occurs only in one direction. While with paintings on canvas, the medium also penetrates through the ground deep in the painting, with glass it only remains on the surface (Ranz 2003).

Regarding the technique of painting on glass plates the literature mostly mentions the use of linseed oil, varnish, tempera and gum Arabic. Linseed oil has good binding properties, but it darkens with age, therefore for lighter colours poppy-seed oil was recommended as it darkens less and is more elastic. Walnut oil has good properties, can absorb a lot of pigment and has
better binding properties than linseed oil. The drying is quicker with linseed oil or varnish than with other oils. (The coating of linseed oil on glass takes four days to dry, walnut oil four to five days and poppy-seed oil six to fifteen days) (Kraighe-Hozo 1991).

For tempera, egg yolk and white were used. Egg tempera has a smooth, half azure appearance and is very durable. Compared to gouache it becomes insoluble in water after drying. On drying the colour brightens and the blacks become more grey than when the same pigment is mixed with oily media. In classical painting a combined technique was often used, often starting with tempera, then lacquering the painting and continuing with oil colours. Some artists also painted with tempera using egg-oil emulsion as a medium (Kraighe-Hozo 1991).

For the production of tempera, emulsions of vegetal resin, gum Arabic and gum tragacanth were used, which were not appreciated because of their pastel appearance and poor elasticity. They were often used in techniques for study purposes, applied in the stage between the gouache and the tempera. The recipes for their production often include the addition of condensed oil or varnish. One defect of these emulsions is the solubility of the colour layer in water after many years (Kraighe-Hozo 1991).

The topic of media in reverse glass painting is a subject not yet researched in Slovenia, while abroad it has widened lately. In Germany, for example, reconstructions have been made with different techniques, using egg white, casein, linseed oil and gum arabic as a medium. Other publications deal with media on based on written sources on the historical use of pigments and technique. Using a variety of methods, scientists analysed pigments and painting media which had been used in reverse painting on glass in the eighteenth and nineteenth centuries. Seven samples of the flaked-off paint from paintings in Murnau Castle were analyzed using gas chromatography. All samples showed oily media – boiled linseed oil – varnish. It contains additives that accelerate drying. As the additives are mostly metal oxides and therefore do not dissolve in linseed oil, they can only be melted with heating to around 300°C. Varnish is more polar than linseed oil and therefore binds better with glass. On the other hand, varnish can be questionable, because it is a binder suitable only for a few pigments, although it dries quicker and accelerates the process of fixing of colours. With some reactive pigments it produces metal soaps. Like glues such painted surfaces can become hard, brittle and fall away. The same happens if the varnish has been overheated during an uncontrolled process of heating. This explains the fact that on glass paintings we can have at the same time both well and badly preserved colours, although the same medium has been used (Koller and Baumer 2003).

The State of Preservation of Reverse Paintings on Glass in the Goriški and Tolminski Museums

Because of negligence and unsuitable storage conditions damage to the support occasionally occurs in paintings on glass. Glass can be a relatively stable material, but the thin glass plates with contained irregularities that were mostly used are very fragile and can break easily. The broken glass can cause abrasion and damage to the colour layers. However, the preservation of paintings on glass depends on two factors – firstly on the painting technique and correct use of pigments and media and secondly on storage conditions and careful handling.

Out of thirty paintings from the Goriški and Tolminski museums, eleven pictures had broken glass. With some all the pieces were preserved, others had missing pieces and there was a need
to complete the missing parts. Only a few paintings are well preserved on the whole. With most of them we can observe the detachment of colour layers, either as blisters or loss of the colour layer. In some cases the detachment is connected with the painting technique. On two pictures all colour layers have almost completely flaked off and only small fragments are preserved. On these fragments we notice rough brush strokes and a lumpy colour surface, which is a sign of negligent or careless work, unsuitable preparation of pigments and incorrect use of media. An interesting case is the broken painting of St. Anthony, where the colour layer is unfortunately very damaged because of abrasion of the glass fragments, especially on the face of the saint. On other areas the colour surface is relatively well preserved, except for the brown colour with which the monk’s frock was depicted (Figure 1). In this case we probably have an incompatibility between the medium and the brown pigment, as German researchers have noted (Koller and Baumer 2003).

![Figure 1. St. Anthony. Broken glass and damaged paint layers. White dots show the location of samples: ANT1 white and red colour: white lead, red lead, ANT2 brown colour: terra verte, ANT3 white colour: soot black and white lead, ANT4 blue colour: unknown, ANT5 yellow colour: massicot, ANT6 brown colour: white lead and iron ochre, ANT7 blue colour: unknown on white background. Samples 1, 3, 4, 6, and 7 contain mould on the surface. Colour layers painted with red lead (1), massicot (2) and white (7) contain crushed glass. 30.5 x 20.8 cm (Goriški muzej, KP 187; Photograph: ©Goriški muzej).](image)

Blisters on the colour layer are present on most pictures. Some colours seem to be more susceptible to that phenomenon, among them the greens and blues when painted over black drawing and contours. We can look for the cause in the sensitivity of the medium which was used for folds on darker garments and petals. This should not happen if a drawing is executed with tempera, but only when a water soluble medium made with gum Arabic is used, as it swells in humid conditions.

On the joins and edges of the contours which confine separate colour surfaces, cracks have appeared. Azure carmine red lacquer which served to line red colour surfaces, has lost its intensity on all the paintings due to UV damage and has become dull almost gray. This is especially apparent on the lips and flames. On the other hand, the layer painted with vermillion (or minium) is very well preserved on most of the paintings. The colour of carnation is mostly undamaged, except for some scratching, the light ochre background on upper part of the paintings is also well preserved. Damage due to detachment and loss of colour is more prominent on the lower section of the paintings.
Analyses of Colour Layers

For microscopic analysis of pigments and binding materials ten samples were taken from the pictures of St. Anthony, The Flight into Egypt (Figures 2 and 3) and Virgin Mary’s heart. The analysis of binding materials with histochemical staining, which would define whether the material is albuminous or oil-based, did not give reliable results, therefore further investigation will be needed. It was ascertained, however, that the red colour of the petal is red lead oxide (minium), the white is lead white, the yellow background is probably masicott and iron ochre. The brown colour of the garment is terra verte (green earth) and ochre, the black colour of the contour probably contains soot (indicated by the presence of carbon), the green colour is terra verte. It was not possible to identify the blue pigment with optical microscopy. In almost all samples mould was present, either in contact with glass or on upper side. It is unusual that most colour layers contain crushed glass of the size 50 µm that was added as a filler for an unknown reason (Nemec and Fister 2007).

UV and IR photography gave interesting results regarding the painting technique. The paintings were photographed from both sides and we found out that in both cases the glass plate does not represent an obstacle for the observation of colour layers from the front. With UV of some paintings on glass we can establish the use of different pigments. Despite a resemblance under normal light, under UV light they fluoresce differently. The contours of faces painted with red colour often have a reddish tone on the photograph, while the ones painted with brown-red are grey (Figures 4 and 5). The ochre background gets a yellow-green cast, the white colour has a shiny white fluorescence typical of lead white. On pictures of St. Florian and St. Barbara we can conclude that the red colour surfaces were first modelled with azure carmine red (Figures 4 and 5). The carmine red azure together with vermilion that overlap on the glass plate form together a pink fluorescence. We can see the texture of the first layer that blocks the second one. Probably the same pigment was used for the flames of burning houses as well as lips and eyelids on faces. Under UV light the pigment changed into transparent grey. The change is more obvious because in these cases the painting
is executed on a light coloured background. On the UVF photographs from the back side of
the pictures the outlines and the overlapping of colour layers are clearly visible and we can tell
the sequence of application of the separate layers. On faces and hands we notice that the colour
layer sometimes covers the surrounding colours and was, therefore, applied as the last one. The
comparison of pictures allows us to see that the face has two layers of colour – slightly modelled
azure and an overlaying paint in a lighter colour. With the help of IR photography the outlines
and texture stand out.

Figure 4. The same panel after restoration (Photograph: ©Goriški muzej).
Figure 5. St. Florian, with actively flaking area on the lower part after consolidation, 30.0 x 19.5 cm
(Tolminski muzej, T 2073; Photograph: ©Tolminski muzej).
Figure 6. The same panel photographed under UV light (Photograph: ©Restavratorski Centre, Ljubljana).

Conservation and Restoration of Paintings on Glass in Slovenia

While setting up the ethnographic collection in the Tolminski Museum in 1985 and 1986
conservation and restoration intervention was carried out on fifteen paintings on glass.

The pictures were mostly framed in thin frames made of black painted wood with a low
profile, closed at the back with wood veneers of different thickness and sizes. The colour layer on
the back of the painting was dusty with fragments of dirt, which had especially accumulated in
the corners. The removal presented problems because of the fragility of colour layer. We initially
used a dry soft brush, and afterwards (when not pulverised) cleaning with appropriate solvents
using cotton wool. We consolidated the colour layer with a two percent solution of Calaton®
(soluble nylon) in water and alcohol at a ratio of 20:80, applied with a brush to allow it to
spread over the whole surface. After a few minutes we inclined the panel and the superfluuous
fluid flowed away. After twenty years we can observe that the colour layer is still well preserved
with no visible detachment, not even on areas where it had blisters.

As an adhesive we used the two component epoxy resin Araldite 396XV/397XV® in the ratio
100:30. The adhesive is very liquid and has a long setting time. The alignment of painted glass
was difficult because the glass panels are slightly bent and because of the colour layer, which must not be affected by the adhesive. We used a flat wooden board lined with Melinex® on which we first assembled the painting face down. With the help of Plasticine® we levelled the joints, following the curves of the glass panel. We secured the edges with more Plasticine® and pins, so that the joints were compressed and stable, and introduced the liquid adhesive. Where pieces of glass were missing we later filled them in. Simple shaped missing fragments at the sides were substituted with Perspex®. More complicated pieces were filled with epoxy resin casts.

Larger damaged colour areas were lined with paper in a corresponding colour, and more recently also with cardboard, on which patches of water colours were applied (Figure 6), or just with a neutral coloured background. The paintings were replaced in the original wooden frames. The paintings restored twenty years ago do not show new damage, but the areas, where blisters were consolidated, show the same greyish cast as before consolidation. The sections that were filled with epoxy resin are slightly yellow, whilst the Perspex® is slightly opaque.

For the restoration of three damaged paintings from the Goriški Museum, carried out in 2005, we used a six percent aqueous solution of Gelvatol® (poly(vinylacetate)) 1 for consolidation, and Araldite 2020® as an adhesive. The missing parts were filled with Fynebond®.

During recent years comparative studies of the characteristics and suitability of different materials used in glass restoration were made with special attention to reversibility, stability and handling. Among others Araldite 2020® is recommended for adhesion and Fynebond® for filling. For the consolidation of colour layers, especially those with blisters, some conservators favour waxes, others water based consolidants like PVA (Coppieters-Mols 1999).

The filling of missing fragments of glass is a very exacting operation, because the glass plates are very thin, with an irregular surface and damage on colour layers also has to be avoided. The filling with resin was carried out from the back, because in this way we could control the resin so that it did not spill over the edges. During setting it contracted, so the surface is slightly concave at the back, while the front side is flat but thicker than the original and needs grinding, which can damage the original surface.

Conclusion

The presentation of work and findings in this article is just a minor contribution to the research into the conservation and restoration of reverse glass paintings, but an important start for Slovenia. The future lies in a cooperation between art historians, materials scientists and specialised conservator-restorers.

Notes

1 This product is no longer available.

References


Nemec, I., and S. Fister, 2007, Tri slike na steklu iz zbirke Goriškega muzeja, Restavratorski Center, Ljubljana, internal report.


Materials
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