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Restoration Centre

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RES.

THE RESTORATION OF QUAGLIO'S WALL PAINTINGS
IN LJUBLJANA CATHEDRAL



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Institute for the Protection of Cultural Heritage of Slovenia

Restoration Centre

The Restoration of Quaglio's Wall Paintings in Ljubljana Cathedral

A conservation-restoration project involving the wall paintings created by Giulio Quaglio (1668–1751)

on the nave vault and the western wall of the Cathedral of St Nicholas in Ljubljana, IPCHS Restoration Centre (2002–2006)

RES. 5

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A detail from the wall painting on the nave vault prior to, after and during the restoration,

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This publication is dedicated to three Slovenian art historians:
Academician Dr. Emilijan Cevc, Prof. Dr. Nace Šumi
and Prof. Dr. Sergej Vrišer.





After the successful completion of the project we would like to thank all who took part and, through their work, special skills, patience and enthusiasm, made an important contribution towards the masterful restoration of Quaglio's wall paintings. Many experts played a direct role in the restoration work on the scaffolding in Ljubljana Cathedral, some from the Restoration Centre, while others were external partners who worked as individuals or as a part of various groups or organisations. Special thanks to all who were involved throughout all the years of the project.

Mag. Rado Zoubek, project leader
Institute for the Protection of Cultural Heritage of Slovenia
Restoration Centre

Words of acknowledgement

Msgr. Alojz Uran

Foreword

Miljenko Domijan

The project from idea to completion

Jernej Hudolin, Josip Korošec



Words of acknowledgements

It is with great pleasure that I salute this monograph published by the Institute for the Protection of Cultural Heritage of Slovenia (IPCHS) and the Restoration Centre on completion of renovation work on the frescoes and the celebration of the 300th anniversary of the consecration of the Cathedral of St Nicholas.

The Italian painter Giulio Quaglio bestowed upon the cathedral the mighty apotheosis of St Nicholas, bishop, patron of boatmen, man of charity and miracles, displaying the victorious cross as consolation to persecuted Christians during the times of the Roman emperors, Diocletian and Maximianus. All the suffering and torture withstood by believers of the faith has been transferred into the radiant colour scheme of the glory beyond.

Cruel scenes of all kinds of torture, which are depicted on the ceiling of the church nave lose their tragic nature in the light of Jesus Christ. “*God, nailed to the cross, out of all of the wonders of the world, has been shaped with a particular flair by the painter, so that it creates an illusion in the eyes of all viewers, as if it were really rising upwards,*” was written 300 hundred years ago by Dean Dolničar, who also added: “*The ceiling of the large new cathedral seems as if it were opening into a new space, into other spaces, upwards, to the heavens, to God. The nave vault exceeds all art, imagination, brilliance and value.*”

The vault of the nave, which had been given a new life by Quaglio’s artful paintbrush, shone out in front of visitors’ eyes on 19 July 1706, when the painting scaffold was removed. The master received great praise and admiration from his contemporaries.

Today we can again admire the original beauty that is further emphasised by the lighting, which was naturally absent 300 years ago.

The restoration work took longer than the original wall and ceiling paintings, which were completed in stages over two years (1705/06). The restorations of the nave vault and the western wall of the Cathedral of St Nicholas required four years’ time with short breaks.

I extend my gratitude to those who gave the impetus for this refurbishment, as well as those that planned and carried out the work as a whole. Although a proper “art stage” was set up, many hours had to be endured in abnormal bodily poses. The most up-to-date photogrammetric image of the wall and ceiling paintings and structure of the cathedral as a whole has given us detailed information, which could be used should any dire consequences arise.

Only when the ceiling was examined in detail was the exceptional quality of the original fresco and basic construction revealed. So much so, that the earthquake of 1895 had no greater impact on the building, even though numerous cracks formed, causing much dirt to collect. Approximately 600 m² of the surface had to be cleaned mechanically – by hand, before chemical cleaning was also used. As much as 95 percent of colour surfaces are original, whereas 5 percent have been filled in afresh by restorers.

Therefore all recognition goes to the team of thirteen restorers under the guidance of Rado Zoubek for their professional zeal with which the project was carried out. Thanks also goes to numerous subcontractors, as well as sponsors and to all the benefactors also for the gifts of the poor widow, which are now incorporated into this magnificent ceiling of our cathedral. Now we can set foot into the Cathedral of St Nicholas, where we can admire it in all its beauty, knowing that these frescoes are not merely painterly artworks. They are an expression of the Christian faith through the centuries; through them the mystery of the incarnate of the Holy Son is passed on from generation to generation; gazing up at them, man looks forward to the visibility of the Invisible Lord.

Msgr Alojz Uran, Archbishop Emeritus*
Ljubljana, 31 May 2007

* Archbishop Emeritus Msgr Alojz Uran was head of the Archdiocese of Ljubljana at the time of the renovation.

Foreword

Man’s incessant endeavours to create a perfect and all-encompassing work of art (perhaps best defined by the German compilation of words *Gesamtkunstwerk*), took form over many centuries, more or less successfully in oratories, the space of the spiritual community. I am convinced that most would agree with the fact that the pinnacle was achieved in the interiors of Baroque churches during the anti-reformation vigour of Catholicism in Europe.

Wall paintings, most often executed in the *a fresco* technique, in their emphasised visual narrative imbued with the evangelical message and covering most of the wall surface of the interior, are usually the most obvious visual emanation of such expression.

For such messages, the quality of the created was not deemed the most important, but it was rather the competitive air that predominated, expressed in the demands of the patron, naturally dependent on the economic and cultural level for the best possible creation. Therefore more skilful painters stood out, or those that we call artists, whose works changed into generally inherited common property.

Such a work was also painted by north Italian master Giulio Quaglio in the Ljubljana Cathedral of St Nicholas. It is undoubtedly the most complete work of art in his extensive oeuvre, expressed in a superb *settecento* manner, which was based on the expansive legacy of great cycles of frescoes of the Italian *cinquecento* and *seicento*. Despite its persuasive expressiveness (dominance), Quaglio’s frescoes are perfectly harmonious with the rest of the visual expression in the interior of the church, united with the material fervour of the sacred message, and in harmony with the Baroque organ music and songs of believers, they actually come close to a perfect *Gesamtkunstwerk*.

The regular, and over the centuries unchanged, purpose of the cathedral is a precious inherited feature, significant for its permanence and preservation. Despite this, with such “use” changes are taking place in all of its components, including the wall paintings, simply from gathering soot and dust, to more aggressive damage, humidity and even changes to the chemical property of the minerals in the pigments.

Since these types of conditions, not only alter the original visual impression, but present obvious danger for greater damage to occur, and sometimes the total loss of the work of art, the complete programme of preservation, protection and renovation of the Cathedral of St Nicholas also included Quaglio’s frescoes. The execution of this task was entrusted to the Restoration Centre of the Institute for the Protection of Cultural Heritage of Slovenia.

The treatment in terms of theory and practice, along with all-encompassing documentation, was realized at the highest, most professional level, constantly present in continued complex and extremely demanding restoration procedures, from the first probes to the last retouches. The seriousness and superior professional precision in the elaboration of physical and chemical properties and changes of the material part of the substances of this cultural monument were consistently complemented with the implementation of current aesthetic conservation-restoration principles when dealing with the renovation and continued presentation. Hence most significantly, Quaglio’s important painting oeuvre was revalorized in the most acceptable manner. It should be brought to attention that the direct treatment was performed by an expert group from the Restoration Centre under the leadership of Rado Zoubek, for which it should receive congratulations and the highest recognition of merit.

The exceptional experience at the ceremonial presentation of the restored vault, filled in again with the heavenly apologetics of visual spirituality on the highest level, went to co-create the presence of every, also the smallest, detail of expert endeavour. And the realization of such a procedure is certainly a cultural deed on a level that surpasses national boundaries and spills into a common European quality.

As president (or more aptly, coordinator) of the international committee with top – Slovenian, German, Italian and Croatian – esteemed colleagues and experts, I express my personal satisfaction, joy and honour (I am totally convinced that this can also be said for all members) at having been co-participants in this scientifically founded and exceptional cultural event.

Prof. Miljenko Domijan, Chief Conservator for Immovable Heritage
Administration for the Protection of Cultural Heritage
Ministry of Culture of the Republic of Croatia

The project from idea to completion

The restoration of Quaglio's wall and ceiling paintings in Ljubljana Cathedral, as one of the most extensive and demanding projects undertaken by the IPCHS Restoration Centre (2002-2006), has brought much that is new in the organisational, methodological and technical sense, as well as contributing to research in the field of Slovenian conservation-restoration practice. All the basic components were involved, interwoven in a complex way: research work, restoration treatments and documentation. In the restoration of the paintings on the nave vault and the two scenes by the window on the western wall we carried out diagnostic procedures and scientific analysis of the materials used, employing different methods; we examined the condition of the colour layers and the consequences of the past restoration treatments on the wall paintings; and we studied the artist's painting technique. One particular research challenge was the attempt to create a "reconstruction" of Quaglio's creative process on the vault of the cathedral nave.

The initial preparations for the project began (in 1997) with studies, planning and the drawing up of a programme of conservation and restoration work. When in 1999 the new Ljubljana Metropolitan Archbishop Msgr. Dr. Franc Rode began the preparations for the celebration of the 300th anniversary of the consecration of the Cathedral of St Nicholas, initial talks took place regarding how to honour this notable anniversary, whilst at the same time expressing appropriate respect to the church itself, this most prominent sacral Baroque building in Slovenia. In addition, this was an opportunity to emphasise past notably confident endeavours by Ljubljana and, last but not least, draw attention to the building's full significance, expressed in the form of the preservation of the most fundamental characteristics of the church's architecture and the works of art adorning it.

Analyses showed – and working meetings and expert consultations confirmed this – that all these goals would be met by an appropriate presentation of the nave vault, as this is the biggest and most obvious treasure in the church and because it celebrates the church's patron St Nicholas. The general evaluation of its condition and prior thermographic and other examinations confirmed that a suitable restoration treatment would not only make sense but was necessary. Viewed from the conservation viewpoint, such a project would signify not only the protection of an important work in the oeuvre of the Lombardy painter Giulio Quaglio, but also the protection of Baroque art as such, by which Slovenia is so recognisable.

The responsibility involved in the decision to undertake such a project was big, whilst the justification of its implementation required wider support, as it was perfectly obvious that the treatment would be exceptionally demanding because it would have to include many factors if the set goal was to be realised. Academician Prof. Dr. France Bernik, the President of the Slovenian Academy of Sciences and Arts, fully agreed with the project after it was presented to him by the Archbishop. The same reaction came from the Ministry for Culture of the Republic of Slovenia Andreja Rihter, as soon as she was assured by the then Secretary of the Ministry for Culture of the Republic of Slovenia Silvester Gaberšček, Director of the Ljubljana Regional Office of the Institute for the Protection of Culture Heritage of Slovenia Prof. Janez Kromar and Director of the National Gallery of Slovenia Dr. Andrej Smrekar, that the Restoration Centre of the Republic of Slovenia was in a position to complete the task successfully. The then Mayoress of Ljubljana, Danica Simčič, also expressed understanding for and trust in the realisation of the project.

The idea of restoring Quaglio's wall and ceiling paintings on the nave vault was a part of an integral restoration of the cathedral, initially led by the then priest, cathedral Canon and Prelate Msgr. Vinko Vegelj and continued by his successor, Canon and Msgr. Peter Zakrajšek, and then after his departure by Msgr. Dr. Franc Šuštar until the present cathedral priest, Canon and Provost Msgr. Jožef Lap replaced him. Their business, organisational and professional knowledge provided the Archdiocese with such complete support that the work was certain to be able to progress without interruption. The financial resources required were guaranteed by: the St Nicholas Parish Office in Ljubljana, together with the Ljubljana Archdiocese, the Ministry for Culture of the Republic of Slovenia, the

City Council of the City of Ljubljana and the Restoration Centre within the framework of its regular activities.

Thus in 2002 a large scaffold with a platform was built and all the equipment necessary for the restoration prepared. The programme was drawn up, in cooperation with other Restoration Centre experts as well as external ones, by Mag. Rado Zoubek, from the Department for Wall Paintings at the Restoration Centre, who also directly managed the project.

The restoration work on the surface of the wall and nave vault paintings began with probing, the testing of various ways of removing the dirt, the establishment of the degree and type of damage, the determination of restoration procedures, the preparation of suitable prescriptions/formulations, materials and tools, etc. After documenting the initial condition and the first scientific and other analyses we arrived at preliminary findings on the basis of which, during further on-going analyses (chiefly chemical) and documenting, we began the main part of the restoration work: the removal of dirt (in two phases, mechanically and chemically), the consolidation of the colour layers, the repairing of cracks and other damage and retouching. On account of the experience gained with treatments involving Renaissance and Baroque wall paintings in Italy, we invited a team of restorers from Italy so that they could carry out chemical cleaning procedures that had hitherto never been done in Slovenia. Numerous reputable advisers from various professions helped us with the preparations for and the work itself: the restorer Mag. Ivan Bogovčič, then a lecturer at the Academy of Fine Arts and Design at the University of Ljubljana, Jürgen Pursche, chief restorer at the Bayerisches Landesamt für Denkmalpflege in Munich, the art historian Dr. Ferdinand Šerbelj from the National Gallery of Slovenia in Ljubljana and the architect Prof. Dr. Jože Kušar from the Faculty of Architecture at the University of Ljubljana.

After careful consideration, the Minister for Culture of the Republic of Slovenia and the Archbishop appointed an international expert committee, consisting of: Prof. Dr. Giuseppe Bergamini (Italy), Dr. Michael Kühnenthal (Germany), Academician Prof. Dr. Vladimir Marković (Croatia), Prof. Dr. Marjan Smolik and Dr. Josip Korošec (both from Slovenia), and the chairman Prof. Miljenko Domijan (Croatia).

Restoration is an activity which in a very special way encounters creative work from the past. This facilitates, even demands that, together with other services which, with due care, deal with material and immaterial heritage past and present, it helps create the present moment and, with the experience it has acquired, contributes towards giving meaning to the new. Only occasionally are we presented with major opportunities – and even less often we are in a position to make satisfactory use of them – for impressive and well-executed projects that, above all, contribute to the development of methods with which it is possible to more suitably and imaginatively meet the challenges posed by heritage, especially to those involved in its protection. In light of growing uncertainty about the scope, importance and even the rationale of heritage protection, which alongside other threats results in a constant dialogue with heritage and everything that defines it and on which it depends, the character and perception of restoration is in a constant state of flux.

We will be as bold as to claim that the restoration of Quaglio's wall paintings in Ljubljana Cathedral was a model interdisciplinary project involving various professions, even at an international level, which with their scientific-research work contributed towards more light being thrown on and the evaluation of the restoration of Quaglio's wall paintings and, in general, of the conservation-restoration issues in connection with wall and ceiling paintings. The exceptional characteristic of this extensive project lies in the new methods used and in the most complex organisation within the restoration profession in Slovenia thus far. This is also apparent in the dialogue with and cooperation between different professions, as well as in the practical restoration work during which, after thorough expert studies and analyses, together with restorers from abroad, we used materials and new restoration methods in the most considered manner.

In addition to the establishment of new working methods (e.g. a more detailed study of the history of the older restoration treatments and their consequences; the use of a chemical method for cleaning dirt hitherto unused in Slovenia; the use of a binder for retouching that has also not been used here before; etc.) the project is also distinguished by the precise, modern documentation created during all the phases of the restoration work. Due to the complexity of the problems involved, the length and the demanding nature of the project, as well as all the innovations, including methodological ones, we have through this restoration acquired exceptionally important knowledge and experience for the restoration of the remaining Quaglio wall paintings in Ljubljana Cathedral and around Slovenia, as well as other secular and church wall and ceiling paintings, very common in Slovenia's artistic sphere, that are in need of restoration.

Jernej Hudolin

Head of the Restoration Centre of the Institute for the Protection of Cultural Heritage of Slovenia

Dr. Josip Korošec

Institute for the Protection of Cultural Heritage of Slovenia, Conservation Centre

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Art historical introduction

Giulio Quaglio, European painter

Giuseppe Bergamini

Ljubljana Cathedral and its wall paintings

Mateja Neža Sitar



Giulio Quaglio, European painter

Giuseppe Bergamini

KEY WORDS:

Giulio Quaglio, Raffaele Quaglio, Domenico Quaglio, Carlo Innocenzo Carloni, Laino, Como, Udine, Ljubljana, Cathedral of St Nicholas, palazzo, fresco, Baroque

ABSTRACT

Giulio Quaglio was born in 1668 in Laino Intelvi. He worked not only in Lombardy and Ticino, but also in a wider Central European area. His artistic development was influenced by his contact with the work of what were then the major painters in the Lake Como area, such as Giovanni Mauro della Rovere, known as Fiammenghino, and the brothers Giovanni Battista and Giovanni Paolo Recchi. However, according to Janez Gregor Dolničar, Quaglio's painting skills fully matured only at the school of Marcantonio Franceschini in Bologna. After seeing Venetian visual art, especially the works of Veronese and Tintoretto, Quaglio began to use lighter colour hues and softened his robust and rather plastic expression. He set off on his artistic path in Friuli, or to be more precise in Udine. He was then first invited to Gorizia, where he painted the vault of the cathedral, and then to Ljubljana, where he created his masterpiece, again in the cathedral. Here, between 1703 and 1706, with the assistance of the young Carlo Innocenzo Carloni, using the fresco technique, he painted the presbytery and the magnificent nave vault with splendid scenes and powerful and eloquent images. After this, he first went to Austrian provinces, followed by a longer period of work in Lombardy and then in 1721, together with his son Raffaele, also a painter, once more returned to Ljubljana. This time, again using the fresco technique, he painted the ceiling of the Seminary Library and the side chapel in the cathedral, where he partly adapted his style to the Rococo. He remained in Slovenia until 1724, when he returned to Laino, where he stayed. Giulio Quaglio, active until the end, died in 1751. The paintings from his later and more mature period, which follow the common iconography, are in comparison to the works he created in his youth not as magnificent, varied or splendid. In his attempts to abandon the Baroque credo and join the Rococo fashion in the first half of the 18th century, he created lighter images, taking away some of the force that had for decades been the mark of his work, and diluted the colours, giving priority to pastel blues, yellows and pinks.

Giulio Quaglio, one of the most fascinating Italian painters from the late 17th and early 18th century, was born in the small mountain town of Laino Intelvi, which lies between Lakes Como and Lugano. Like a number of his compatriots – architects, stucco workers and painters – he lived as an itinerant artist. Thus he worked not only in Lombardy and Ticino, but also in a wider Central European area, from Friuli to Carniola, from Trento to Styria and the Salzburg area. In spite of all this, he is to this day better known among experts as the first teacher of Carlo Innocenzo Carloni than for his many paintings, among which stand out the cycles of frescoes he created in churches and palaces.

He was born around 1668 to the painter Giovanni Maria Quaglio, who is said to have been a pupil of Tintoretto, and Lucia Traversa. His father's brothers Giulio and Domenico (the latter in 1676 signed what is a little known cycle of frescoes in the church of St Victor in Castello di Laino) were also professional painters. Thus we can assume that he gained his first artistic experience within the family, while his familiarity with the work of what were then the major painters in the Lake Como area, such as Giovanni Mauro della Rovere, known as Fiammenghino, and the brothers Giovanni Batista and Giovanni Paolo Recchi, was also important. Janez Gregor Dolničar, the artist's friend from Ljubljana, states that Quaglio's painting skills fully matured only at the school of Marcantonio Franceschini in Bologna, dominated by the paintings of the Carraccis, Guercino, Reni, Cignani and Pasinelli. Quaglio stayed faithful to this style, even though after seeing Venetian visual art, especially the works of Veronese and Tintoretto, he began to use lighter colour hues and softened his robust and rather plastic expression. When, because of various circumstances in his life and the requirements of his commissioners, he had to alter his figurative language he revealed astonishing capabilities of adaptation and flexibility of thought.

Quaglio embarked on his artistic journey in Udine, to where he was invited in 1691 and 1692 by two builders from his home town – Bartolomeo Rava and Giovanni Battista Novo, who were during the urban renovation of the town entrusted with the construction of a number of palaces, among them the town pawn shop (Monte di Pietà) and Palazzo della Porta. In 1694, Quaglio married the



Figure 1: Giulio Quaglio, the ceiling decoration from 1692 in Strassoldo palace, Udine.



Figure 2: Giulio Quaglio, *Crucifixion* from 1694, the chapel of St Mary, Monte di Pietà, Udine.

sixteen-year old Margherita, Novo's daughter, with whom he had seven children, three of which – Raffaele (b. 1695), Giovanni Maria (b. 1709) and Domenico (b. 1714) – decided to become professional painters and worked in their father's workshop.

Between 1692 and 1701 Quaglio worked in Udine and Friuli where, using the fresco technique, he decorated churches and palaces with religious and mythological images and created numerous altar paintings. He spent the springs and summers in Udine, while in the winter he moved to his birthplace, Laino, as it was impossible to paint frescoes when the plaster froze due to low temperatures. During this time, he worked on commissioned paintings at his home. He continued this practice even during the years he worked in the Gorizia area and in Carniola.

The first works bearing his signature and the year 1692 – two frescoes with historical and mythological images that he painted in the Palazzo della Porta and Palazzo Strassoldo – already hint at the poetics which, without significant changes, marked the whole of his artistic oeuvre: robust and grandiloquent forms, huge figures with pronounced nuances of light, *horror vacui* and a very modest interest in landscape. The scenes in his paintings are additionally emphasised by decorative elements in the form of monochrome painting and relief patterns on white stucco-work, created by his co-workers, mostly by Lorenzo Retti and Giovanni Battista Bareglio, also from Val d'Intelvi.

Particularly splendid is the painting work he carried out in the Strassoldo palace in Udine, which he then repeated in the Daneluzzi and Antonini palaces: Baroque rapture, underlined by powerful forms and emotions, combining Emilian theatricality with Venetian power, represented a surprising new feature in the art of the Friuli region, more accustomed to subdued paintings with restrained and mod-

est forms. And it was this difference that brought Quaglio numerous important commissions.

One of these was for the painting in the chapel of the town pawn shop (Monte di Pietà). This lavish building was built in 1660 on the basis of plans by Bartolomeo Rava from Como and then renovated in 1663 by the Venetian architect Giuseppe Benoni. Within the precise and attractive decorative design of the ceiling stucco-work, Quaglio painted calm, cheerful and lyrical stories about the Mother of God, creating a joyful scene, the highest expression of which were the light, glowing colours. In the six scenes from Christ's Passion, which he painted on the walls, we can see a depiction full of dramatic sequences and rapture, which is subdued in some places while in others it expresses itself through the force of the images. It is significant that in this cycle the date of creation and the painter's signature appear twice.

Another of Quaglio's commissioned projects in Venezia-Friuli was carried out for the Franciscans in Cividale, who in 1693 entrusted him with the painting of the vestry of their church, while the priest in Venzone in 1696 ordered two altar paintings, one of which, *The Presentation of Jesus at the Temple*, is a true masterpiece and a model for later works. In addition, Quaglio in 1699 painted the extensive vault of St Clara's monastery church in Udine, which a group of stucco-workers from Lombardy had divided for him into numerous separate fields. Priests in Colloredo di Monte Albano (around 1696) and in Valvasone (1701) also commissioned work in their churches.

The artist painted the most extensive cycle of frescoes in Udine between 1697 and 1698 in the palace of Count Antonio Antonini (the present day seat of the provincial administration). On the ceiling above the large staircase he depicted *The Truth which Banishes the Darkness of Paganism*. Within the lavish decorative design of the stucco-work on



Figure 3: Giulio Quaglio, *The Truth Banishes the Darkness of Paganism* (detail) from 1698, Antonini palace in Udine, (provincial administration building).

the ceiling of the main hall he painted *The Fall of Faeton* and *An Allegory of the Months of the Year*, while on the walls he depicted scenes from Greek mythology and glorious historical acts. The iconography chosen almost entirely by the commissioner was used by Quaglio also on his later frescoes in the Meerscheinschlössl in Graz in 1708 and in the Martinengo Palatini palace in Brescia between 1714 and 1715.

Quaglio's fame spread beyond the Venetian Republic, to which most of Friuli then belonged, and reached Gorizia, which was at that time a part of the Habsburg Empire. The painter, who had already in 1700 done some work in the cathedral in Gradisca d'Isonzo, was in 1702 invited to Gorizia in order to paint the nave ceiling, the triumphal arch and the ceiling of the women's gallery in the cathedral. Sadly, all these works were destroyed by bombing in World War One and can thus be evaluated only on the basis of photographic evidence from the early 20th century.

This work is of crucial importance for understanding Quaglio's subsequent creative journey, as the large fresco on the flat ceiling tells of a radical change in his conceptual approach. The usual division of the surface into small sections, which needed to be filled with concise, thematically rounded scenes where colours and rhythm were dictated by the stucco-work decorations, although pleasant and likable due to the suggestive play of light and shadow, was also imposing and excessively majestic, so that when looking at the whole it annulled the painting work. Quaglio replaced this with a huge unified scene that covered the whole of the ceiling. And this happened in a building which had been excessively encumbered by decorative elements introduced by the very recently completed renovation work. The painter looked for examples to the Baroque art of Pietro da Cortona and Andrea Pozzo in Rome and the magnificent ceiling paintings in the Barberini palace and, in particular, those in the church



Figure 4: Giulio Quaglio, *Peisistratus Depos Comus* from 1698, Antonini palace in Udine (provincial administration building).

of St Ignazio, as it is most likely that Quaglio knew Pozzo, a monk from Trento, and socialised with him.

The scenographical architectural illusionism of the Emilian type, which he would also be able to admire in the Udine Carmelite church, where the ceiling had at that same time been spectacularly painted in the fresco technique by the Bologna *quadraturist* Pietro Antonio Torri, was as yet of no interest to Quaglio. He did, however, use all of his creative capabilities with regard to figure painting, so that he filled the space with *Paradise*, which was crammed with saints, who among the clouds and angels swirled perilously and vertiginously around the central figures of the Holy Trinity, bathed in blinding light. It is an imaginative way of resolving the relationship between space and light, which was very widespread in Venetian decorative art in the early 18th century, where the composition rests on the centrifugal aspect.

Quaglio's activities in the Gorizia area had an immediate positive reaction in the neighbouring Carniola, which was also a part of the Habsburg Empire. At that time, the cathedral in Ljubljana was being rebuilt according to plans by Andrea Pozzo, who modelled it on the anti-reformation shape of the Jesuit church Il Gesù in Rome. Due to an excess of work and an invitation to Vienna in 1702 Pozzo was un-



Figure 5: Giulio Quaglio, ceiling painting in the Gorizia Parish Church of St Hilarius and St Tatian from 1702 (photograph from 1915).

able to personally supervise the construction work, which was led by other builders, among them Gregor Maček from Ljubljana. He also declined an invitation to paint frescoes in the presbytery, dome and the nave. In order to resolve the situation, the Dean Janez Anton Dolničar, following the advice of the aristocrat Giovanni Andrea Coppini and Francesco Lanthieri, a Gorizia count and Carniolan deputy duke, turned to Giulio Quaglio, who began the work in 1703. This was undoubtedly the most demanding artistic achievement of this painter, which took four years (the work was completed in 1706) and was created with the help of local masters and his sixteen-year old pupil Carlo Innocenzo Carloni.

Quaglio came to Ljubljana at the time of the intense development and cultural flourishing of this city, the result of the founding of *Accademia operosorum* in 1693, which established the Baroque as a new artistic style. It encouraged the

demolition of the old cathedral and the building of a new one and the renovation of the whole of Ljubljana in the Baroque style. In addition to the local painters, Italian, Flemish and Austrian artists were involved.

Quaglio entered this diverse cultural environment as an established artist with his own aesthetic views. The Gorizia experience and the awareness of the fact that in Slovenia decorative art with a characteristic exaggerated perspective was very popular, which can be seen in the astounding painting in the Celje Old County building from the early 17th century and in Brežice Castle, led Quaglio to choose perspective illusionism and so his school took the lead in this direction in Slovenia. It is a fact that he was immediately copied by his follower France Jelovšek (1700–1764) and he also partly influenced the poetics of Valentin Metzinger.

The presbytery frescoes (we have to imagine them in their original colours which have, sadly, been greatly impover-



Figure 6: Giulio Quaglio, *The Deposition from the Cross* from 1706, Puštal Castle near Škofja Loka.



Figure 7: Giulio Quaglio, *The Apotheosis of St Joseph* from 1706, the Cathedral of St Justus, Trieste.

ished by restoration treatments, especially those in the 19th century) are de facto an example of the painter's forceful, highly imaginative art, full of dynamics and design skills, expressed in the four stories of *The Miracles of St Nicholas*. In one of the stories the artist depicted himself as a serious, elegantly dressed painter with brushes in his hands and much more mature in age than his actual 36 years. Janez Gregor Dolničar in his *Historia Cathedralis Ecclesiae Labacensis* (The History of Ljubljana Cathedral), 1701–1714, described very vividly how the painter depicted himself with the help of a mirror when during a holiday he had locked himself in the cathedral. He chose to place his image in the scene in which St Nicholas gives bread to the poor, symbolically implying that he, too, had received a large piece of bread thanks to St Nicholas, the cathedral's saint.

The desire to include his portrait in the painting tells us how proud the artist was of his work and that he was aware of what a masterpiece he had created. He completed it with a monumental fresco in the nave vault (with an exceptionally precise, careful, scientifically based, lengthy and expensive restoration treatment the Restoration Centre of the Institute for the Protection of Cultural Heritage of Slovenia has returned the painting all of its original splendour), which is the most magnificent work in Quaglio's extensive artistic oeuvre.

In the central part, there is a depiction of *The Apotheosis of St Nicholas* and on the edges are scenes of the persecution of the Christians, and then angels, apostles and other figures. Quaglio achieved illusionist effects with a well thought-out geometrical structure, which defines the space, and with the skilled placement of each individual figure, rather than with the help of architectural quadratura of the type used in Rome by Andrea Pozzo, or the Bologna type, typical of many *quadraturists* in the Emilia, Veneto and Friuli regions. With a whole series of clever features – decorative rectangular frames, whose narrowing leads to a rectangle in which the painting field is placed within a rounded frame containing the scene of the apotheosis of St Nicholas – he managed to link the highest point of the nave, where the space is opened to the light coming through the windows, with the concave vault. He positioned two false domes on the outside edges of the rectangle; the base of the domes is the frame of the end rectangle, interrupted by the “vaults” above the windows. There is a play of mutually linked spaces, from which it is difficult to take one's eyes, one reason being that the numerous figures filling the composition with an unbelievably rich gallery of portraits, stances, emotions, poses and costumes, are usually not placed in a determined space, but rather it seems as if they are moving from one space to another. And because they are leaning on the frames and architectural elements, often stepping out of them, they help create an illusionary situation, in which the border between reality and the imaginary is lost. In comparison to his previous paintings, there is here no central point of the dynamic composition, i.e. a dominant figure or scene, as all the characters are equal, both in size and importance. Even St Nicholas himself, to whom the church is dedicated, is positioned well away from the centre, as he is



Figure 8: Giulio Quaglio, *The Victory of the Christian Faith over Paganism* from 1708, Meerscheinschlössl, Graz.



Figure 9: Giulio Quaglio, *The Apotheosis of St Joseph* from 1717, oratory of St Joseph, Laino.

painted on the extreme edge of the frame, in a scene where he is showing the Cross to the martyrs, so that he is almost diametrically opposed to the figure of the executioner, who is lifting his sword in readiness to kill a young woman with a child in her arms.

In this exciting composition of diverse sentiments and expressions Quaglio realised his artistic vision in such a way that he put his fifteen years of experience from the Friulian environment into action. Architectural design following the example of the Roman Baroque, the decorative style of the Emilian type, and figures that combine the elements of both the Emilian and Venetian schools (with some traces of realism from Lombardy) are the characteristics commonly found in the Ljubljana creations of Giulio Quaglio. His paintings have an unbelievable effect which, at least partially, prompted the enthusiastic assessment by Izidor Cankar that “*the Ljubljana ceiling fresco is not only his greatest work, but is in terms of its artistic value also the most important, as all the previous paintings seem like a preparation for this one and all his subsequent work just an imitation of what he had achieved in Ljubljana.*”

It is true that in his subsequent work there were no more surprises. If with regard to quality the cathedral altar paintings dedicated to St Dismas and St Barbara are exceptional, the fresco in the chapel of the Puštal mansion near Škofja Loka is already somewhat more subdued (during the period when he was working in the cathedral in Ljubljana, the painter received numerous commissions, in particular studio paintings); with regard to inventiveness the frescos in the chapel of St Joseph in the Trieste Cathedral of St Justus (1706) are of a lesser value, while the fresco on the ceiling of the Graz Meerscheinschlössl can only be described as average. Count Leopold von Stubenberg entrusted its creation to Quaglio, although during that period there were many im-

portant painters active in Graz and its surroundings, among them Matthias Echter, Antonio Maderni, Franz Karel Remb and Joseph Grafenstein.

The concave ceiling was painted in the fresco technique by Quaglio in 1708 and depicted the triumph of the Christian faith over paganism, a theme that he had already utilised in the Antonini palace in Udine. Although the ground plan of the salon is square (with sides measuring nine metres), the artist placed the composition in a circle, which he framed with a rounded support, which was in the corners leaning on the portico, and with a parapet and other architectural elements partially covered with coloured draperies. On the walls above the doors, he interrupted the portico with alcoves at the sides of which there are Atlantes supporting the jutting roofs, on which sit male figures with amphorae, from which water is pouring. And in the alcoves, he painted allegorical figures. Just as on the ceiling of the staircase in the Antonini palace in Udine, the falling figures – Giambattista Tiepolo later used them as an example for his work *The Expulsion of the Rebellious Angels* in the Patriarchal palace – are sometimes awkward and, due to their unnatural positions, not very credible. The greatest value of this Graz ceiling painting are the pleasant colours in warm hues, the subdued allegoric nature of the depicted figures and the strongly emphasised centrifugal force pushing the figures to the edge of the composition, which was, perhaps following Quaglio's example, used by the painter Matthias von Görz on the frescoes in the Attems palace and the abbey at Vorau.

There is no certain proof of Quaglio's work leaving a mark in Styria's artistic milieu, but he was undoubtedly valued by commissioners, as in 1709 he was offered work at the summer residence of the Bishop of Salzburg, i.e. at Klessheim Castle, designed by the architect Fischer von Erlach, in which numerous stucco workers from Lombardy were



Figure 10: Giulio Quaglio, *bozzetto* from around 1720 for the ceiling of the Seminary Library in Ljubljana, Casa Quaglio in Laino.



Figure 11: Giulio Quaglio, the ceiling painting from 1721 in the Seminary Library in Ljubljana.

already engaged, among them Paolo de Allio and Diego Francesco Carlone from the same part of Italy as Quaglio.

Rich documentation has been kept about the extensive work the artist did in this castle, from which it is clear that on 5 September 1709 Quaglio created the painting *Abraham and the Angels*, and on the ceiling of the bedroom known as *Retirade*, located in the external section of the north-western wing of the castle, *Noah's Sacrifice*. The latter is one of his most balanced works, especially with regard to the relationship between the figures, landscape and space – where the mighty and zealous depiction of the Biblical Father dominates the whole of the space.

Noah's character is a precursor of the work *St Paul the Blessed* in the church of San Paolo d'Argon. Even though the image is completely new and Quaglio never used it again, the place where the event occurs is demarcated by a colourful rainbow, a symbol of the reconciliation between God and Man. The *chiaroscuro* application of paint, the intensity of expression and the richness of draperies show the best of Quaglio's creativity. Unlike his pupil Carlo Innocenzo Carloni, who worked in German speaking provinces for a long time and was exceptionally successful, Quaglio completed his activities in Austria with the frescoes in Salzburg. In late 1709 he was already employed in Bergamo, painting the ceiling in the chapel of *Pio Luogo della Misericordia* and the presbytery, nave ceiling and five chapels of the church in San Paolo d'Argon (Bergamo), which he finished in 1714.

It is interesting to observe how the artist's poetics changed in comparison to his work in Ljubljana. In contrast to Gorizia and Ljubljana, he did not conceive the painting of the exceptionally extensive surface of the nave vault in such a way that it would be possible to encompass it with a single look. Instead, he divided it into three parts and fragmented it into sections and fields of various geometric shapes, filled with complex scenes, full of figures as well as isolated saints, as was dictated by Benedictine theological views. At the same time he used lighter colours, created less mighty and less zealous figures, while the scenes are very lively, but in them there is less enthusiasm and pathos. He dedicated considerable attention to detail, both in the foreground and the background, and to the quality of the painting, in spite of the fact that due to the height of the ceiling which prevents a viewer from observing specific details, he could have created a painting of a larger scale with larger colour surfaces.

This was the beginning of a conceptual and stylistic change which in subsequent years became obvious in the frescoes in Lombardy. This does not refer so much to the suggestive and magnificent painting in the presbytery of the

parish church of saints Quirico and Giulitta in Lezzeno on the east bank of Lake Como (1712) as to the mythological and historical scenes from Apollo's salon in the Martinengo Palatini palace in Brescia (1714), which are in the same spirit as the paintings in the salon of the Antonini palace in Udine, the frescoes on the vault of the oratory of St Joseph in his hometown of Laino (1717) and in the works from the same period created in the nave of the church of Santa Maria di Oleno in Sforzatica (Bergamo).

The obvious change of style is most visible in the Ljubljana works from the period 1721 to 1723. The likeable painting on the ceiling of the Seminary Library, which is of a lighter composition, is already suffused with the Rococo. The same applies to the frescoes created in the cathedral side chapel, where the mediocrity of the creativity and execution are additionally emphasised by the badly preserved state of the paintings, for which restoration treatments in the past can partly be held responsible. The presence of his son Raffaele (born in 1695), as well as the fact that he had become a widower, is certain to have contributed to the change of direction. At the time when he was working in Ljubljana, he got married for the second time to Giovanna Forabosco, with whom he did not have any children.

The Ljubljana chapter and the inhabitants of the town received Quaglio's work with great enthusiasm. In addition to the agreed payment, they also thanked him for his exceptional work with a gold-plated silver washbasin and base, which he could take home as a permanent memento of Ljubljana. This gift was very precious to Quaglio as he looked after it with great care and mentioned it in his will in 1733, leaving it to his son Domenico, also a painter, telling him to pass it onto his male successor when the time came.

Prior to his final return to Laino, Giulio and Raffaele stopped in Komen on the Karst, where in 1724 they painted the bath-tub shaped vault of the presbytery of Mary's church in Obršljan. It is a faultless work which, however, does not exude any energy either in the shape of the figures or the mixture of colours, which are all in lighter hues.

Giulio Quaglio, who remained creative and active almost to the very end, died in 1751 (his last work which he signed with pride, the altar painting of the martyrdom of St Andrew in the church in Villa d'Adda near Bergamo, was created in 1749); however, art critics emphasise that in comparison to his early work, the paintings from his mature period, in which he basically repeated the common iconography, are not as magnificent, lively and splendid. In his fruitless attempts in the early 18th century to abandon the Baroque credo and join the fashionable Rococo, the artist made his images lighter



Figure 12: Giulio Quaglio, fresco on the presbytery vault from 1724, the Succursal Church of the Mother of God in Obršljan near Komen.



Figure 13: Giulio Quaglio, *The Massacre of the Innocent Children* from 1726, the parish church in Stazzona.

and reduced the intensity of colours, giving priority to pastel blues, yellows and pinks.

Even during the time when he was no longer as creative as before and when he was losing his strength, Quaglio showed exceptional craftsmanship in the well executed cycles of frescoes with a strong emotional charge which he painted in the parish church in Stazzona (1726), the oratory of Madonna del Restello in Castiglione Intelvi (1726), the parish churches in Esine (1727) and Alzano Maggiore (1727) and in the oratory of Santa Maria di Loreto in Lugano (1729). He also created numerous other small paintings in churches and palaces in Lombardy, both in the oil and in fresco technique. We can assume that a considerable contribution to these was made by his sons Giovanni Maria and Domenico (Raffaele most probably died soon after 1724).

His last, more prominent works are in the parish church and the church of Santa Maria del Rezzo in Porlezza, a place beside Lake Lugano, where he worked between 1737 and 1748, at the time when his son Michelangelo was a provost there. Whilst on the frescoes in the parish church in the chapel of the Holy Cross and St Maurizio he used in a slightly weary fashion the previously used formulae, so that his former magnificence paled considerably, in the paintings created on the walls of the small presbytery and vault of the dome in the church of Santa Maria del Rezzo it is possible to see the radical change in the poetics, on the basis of which we can assume that the artist only created the concept and left the actual execution to his sons. This is particularly obvious in two scenes depicting *The Birth of the Virgin* and the *Presentation of Jesus at the Temple*, in which one feels a lack of the picturesqueness and zeal which had for decades personified his art.

It seems that this exceptionally creative painter had exhausted his artistic inspiration during the last fifteen or twenty years of his life, as the later works no longer reflected

the human and religious values of the then society. Perhaps this is why, after Quaglio's death in 1751 at his home in Laino, his fame and art unjustly faded into oblivion. Unjustly, because this was an artist who should not be ranked among the "less important" painters – although this has happened – as he was undoubtedly an important personality of convincing and outstanding expressive capabilities, who remained faithful to his artistic credo even when fashion started to change and whose paintings greatly improved the attractiveness of churches and palaces in several European countries.

Ljubljana Cathedral and its wall paintings*

Mateja Neža Sitar

KEY WORDS:

Cathedral of St Nicholas, St Nicholas patron saint, Ioannes Antonius Thalnitscher / Janez Anton Dolničar, Ioannes Gregorius Thalnitscher / Janez Gregor Dolničar, Baroque, Giulio Quaglio, illusionistic wall and ceiling paintings

ABSTRACT

The *Academia Operosorum* period in Ljubljana marks a significant and symbolic point in time, when a far more affluent, expressive and frequent influence of Italian art than had until then been present in the Slovenian arena began to be felt – in terms of various cultural and artistic, as well as other, regards. The new cathedral was thus constructed during 1701 and 1707 with this ambitious regard towards Rome, and following the drafts of the most distinguished Roman architect, painter and theoretician, Jesuit Andrea Pozzo. A significant influence – that of the Roman Jesuit Church of the *Gesù* – is reflected in its single-nave vaulted Baroque hall, with side chapels and galleries above them, with transept and dome above its crossing (initially illusionistic), and Quaglio's illusionistic wall and ceiling paintings. The great wish of the cathedral dean and main instigator for its construction, Janez Anton Dolničar, to secure the collaboration of Andrea Pozzo remained unrealised, due to the artist's brimming work schedule. The dean entrusted the wall and ceiling paintings of the new cathedral to Giulio Quaglio, who had gained his painterly reputation through his paintings of churches and palaces in Friuli and, just at that point in time, also with his work in the parish church in Gorizia, today a cathedral (1702). Quaglio undertook his most important art commission – the wall and ceiling paintings of Ljubljana cathedral, as one of the most extensive fresco works in Slovenia – with his first assistant and proper student, the sixteen-year-old Carlo Innocenzo Carloni, and most probably with other assistants between 1703 and 1706. All scenes are dedicated to the story of the Ljubljana diocese and its patron saint, St Nicholas. The nave vault presents the story of St Nicholas, who – during the Diocletian and Maximianus persecution of Christians in Myra – encourages the faithful to martyrdom with his gesture pointing to the scene of The Victory of the Holy Cross, whereas three scenes from the legend of St Nicholas can be found on the western wall.

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The *Historia Cathedralis Ecclesiae Labacensis* (1701)¹ represents the main resource for gaining an insight into the architectural history and the origins of the new Baroque cathedral itself, as well as its wall and ceiling paintings. Its author was an important academic and co-founder of the *Academia Operosorum*,² the chronicler Janez Gregor Dolničar (1655–1719).³ Today we have two essential works that present a thorough overview of the history of Ljubljana Cathedral. The first is a work by Janez Veider⁴ who, in 1947, as part of his PhD thesis, took up research on architectural developments and fittings of the old cathedral, leaning particularly on Dolničar's *Historia* and archival sources, and in 2003 Ana Lavrič edited and published a newly revised critical text entitled *Zgodovina ljubljanske stolne cerkve* (A History of Ljubljana Cathedral), which offers a precise and well documented account

¹ DOLNIČAR 2003, p. 43; originally as: Ioannes Gregorius Thalnitscher, *Historia Cathedralis Ecclesiae Labacensis*, Labaci 1701–1714, (1882-print), Seminary Library in Ljubljana, rkp. 5 (manuscript transcript: NŠAL, ŠAL/Zg. zap., fasc. 2). In writing *Historia*, Dolničar took as an example the work by Philippo Bonanni, *Templi Vaticani historia*, Roma 1696 – more on this and the older translations of *Historia* (particularly Lukman's version which is critically supplemented): LAVRIČ 2003 a, pp. 41–43.

² Following the example of Italian academies, the *Academia Operosorum* was established in Ljubljana in 1693 (more on the academy of the industrious: *Academia Operosorum*, 1994). Cf. PRELOVŠEK 1984, pp. 177–188. The basic novelty in the work of this elite intellectual company educated at Italian universities was their planned and organised programme which they implemented and carried out (already in Dolničar's *Historia* certain subject matters contain the characteristics of theoretical essays, establishing certain judgements on the theory of art and aesthetics, whereas his son Aleš Žiga Dolničar went on to deal with this more concretely (LAVRIČ 1996 c, pp. 35–78). The establishment of scientific and artistic academies is typical of this period (LAVRIČ 2001, pp. 67–82). Works of art by renowned Italian artists were commissioned even more often. Among the most esteemed members of the *operosi* were the Dolničar family and the president of the association, provost of the cathedral, Janez Krstnik Prešeren. For a list of members, the significance of their work and references to older literature on the subject cf. LAVRIČ 2003 a, p. 31; cf. LAVRIČ 2005, pp. 139–157. For evaluating the cultural atmosphere of an important Baroque centre in Central Europe at the time – Ljubljana, among others: PRELOVŠEK 1997, pp. 51–60.

³ More on Janez Gregor Dolničar: LAVRIČ 2005, pp. 139–157.

⁴ VEIDER 1947.

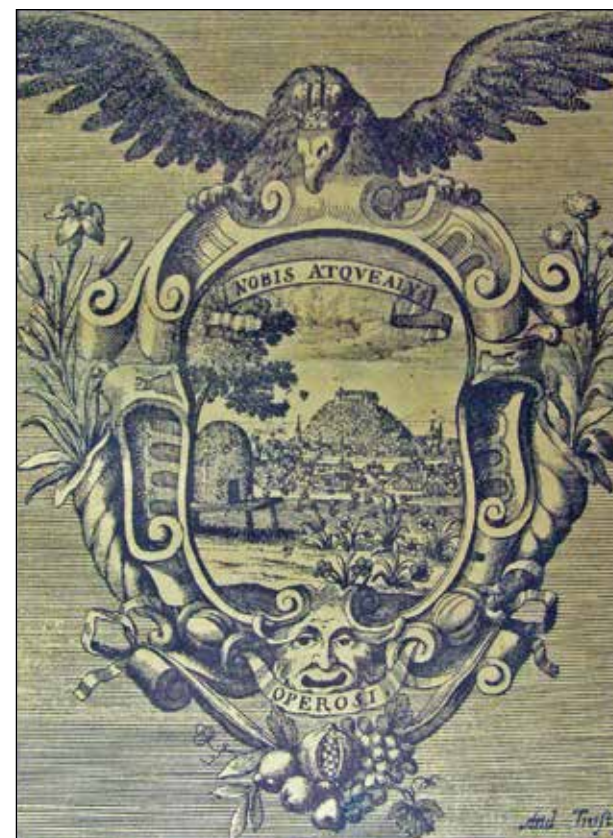


Figure 1a: Engraving from the title page of the statute of the Academia Operosorum, 1701.

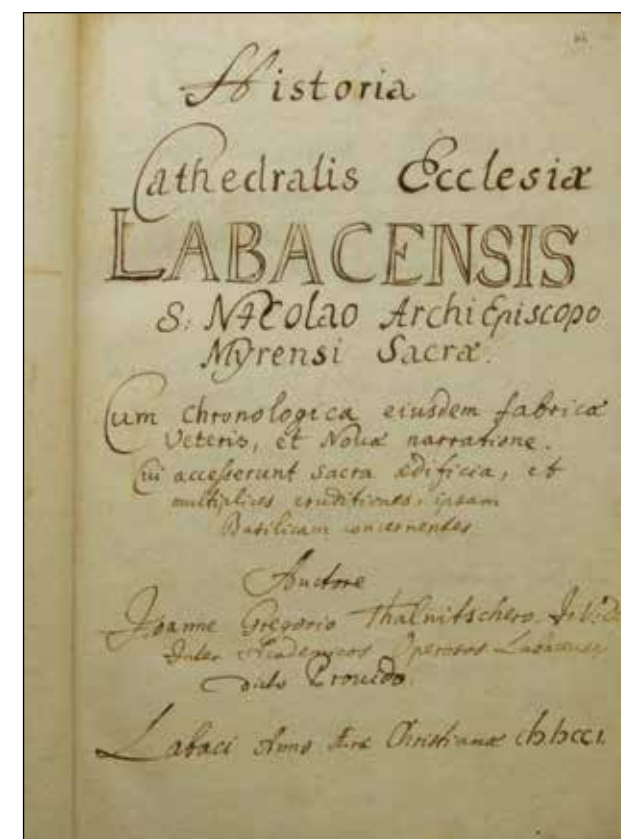


Figure 1b: First page of Janez Gregor Dolničar's chronicle *Historia Cathedralis Ecclesiae Labacensis*, 1701, Seminary Library in Ljubljana.

on the origins of the Baroque work of art as a whole, very valuable to us in our not insignificant presentation on the origins of the wall and ceiling paintings. According to old tradition, which wanted to see the roots of the predecessor of the St Nicholas cathedral going a very long way back, the fishermen and boatmen built it on the Ljubljana river in as early as the 7th or 8th century.⁵ This, however, does not tie in with other information. St Nicholas,⁶ a bishop from Myra in Asia Minor (died around 350), is the most important patron saint of fishermen and sailors. He was a popular saint throughout the centuries, particularly in the 11th century after his relics were transported to Bari, when the worship of this saint spread also in the West. It is more feasible therefore that the boatmen and fishermen constructed it at a time after 1087.⁷ The first single-nave church of St Nicholas was expanded into a three-nave pier basilica with three semicircular

⁵ Cited by Gruden according to Dolničar's *Historia* (p. 10). He also mentions an even earlier date, the 6th century, and cautions that the worship of St Nicholas in the West began very early on, but only became more widespread after the body of the saint had been transported from Myra in Asia Minor to Italy (Bari): GRUDEN 1915, p. 2; cf. LAVRIČ 2003 a, p. 53.

⁶ DOLENC 1973, pp. 458–463.

⁷ LAVRIČ 2003 a, p. 53 with reference to remaining literature.



Figure 2: The Ljubljana Cathedral of St Nicholas over the years: its predecessor, the Gothic and Baroque cathedral, and initiator of its construction (*Ilustrirani Slovenec*, 1928).



Figures 3a–3g: Portraits of those responsible for the construction of the Baroque Cathedral and the wall paintings in it: **3a:** chronicler Gregor Dolničar; portraits thought to be of: **3b:** Dean Anton Dolničar, **3c:** Provost Janez Krstnik Prešeren and

apses,⁸ while it also took over some parish functions during this time. During the years after the fires (1361 and 1382),⁹ its Gothic image began to take shape with the construction of a Gothic long chancel¹⁰ in place of the Romanesque main and northern side apse, with the bell tower being added at the entrance. In 1461, when the diocese was established, the naves were also vaulted in the late Gothic style.¹¹

Bishop Rabatta wanted to give the old church a Baroque look in 1670, but the mighty Gothic church remained in place until 1701, when it was demolished because of the new liking in the arts.¹² It was replaced by a two-tower vaulted hall with side chapels and galleries above them which, with its transept and “dome” above the crossing and the illusionistic¹³ wall and ceiling paintings by Quaglio,¹⁴ represent-

ed the “*.../ first decent regard towards the Jesuit Church of the Gesù /.../*”,¹⁵ and has become one of the most important monuments of Baroque art dating from the beginning of the 18th century in Slovenia. The illusionary dome was initially decorated by Quaglio’s illusionistic ceiling painting, but in 1841¹⁶ a real 24 metres high dome with drum and lantern was built by master builder Matej Medved. The carpentry was taken on by Jurij Pajk and painting by Matevž Langus in 1844.¹⁷

The cathedral dean and vicar general, Janez Anton Dolničar (1662–1714), whose older brother was Janez Gregor Dolničar, decided to have a new cathedral built in 1700, together with the chapter and bishop. Certain members of the intellectual elite of the time, the *Academia Operosorum*, contributed with ideas and designs. The dean spent quite some time on choosing the right architect and the best design.¹⁸ He worked with Carlo Martinuzzi,¹⁹ the Capuchin friar Florentianus, master Pietro Gianni from Gorizia,²⁰

1994, pp. 40, 43 ; CEVC A. 1996, pp. 25–26; LIPOGLAVŠEK 1996, p. 70; MUROVEC 2006, pp. 109–110.

¹⁵ LAVRIČ 2003 a, p. 55. Šumi draws attention to the difference from the mentioned model – the flat finish of the presbytery in the cathedral. Lavrič adds that this was Florentiano’s idea (Florentianus Ponnensis produced the first plans for the new cathedral; cf. ŠUMI 1961, p. 14) and emphasizes the fact that it is precisely the illusionistic vault painting that raise the cathedral to the standard of contemporary creations: LAVRIČ 2003 a, p. 55, fn. 283; cf. ŠUMI 1961, p. 17; ŠUMI 1969, XVIII. On the stylistic analyses of the architectural plans for Ljubljana Cathedral also: PRELOVŠEK 1984, p. 179; ŠUMI 2007, pp. 11–13, 44–47, 231.

¹⁶ On constructing the dome: STESKA 1939, pp. 158–164 and LAVRIČ 1997, pp. 32–52.

¹⁷ LAVRIČ 1996 a, p. 27 with reference to older sources and literature.

¹⁸ More precisely on the selection of the right plan and architect: DOLNIČAR 2003, pp. 226–229; LAVRIČ 2003 a, p. 55.

¹⁹ STESKA 1933, p. 64; PRELOVŠEK 1993, p. 11; SAPAČ 2007, pp. 250–252 with reference to other literature.

²⁰ SERAŽIN 2000, pp. 392–393.

⁸ Without a transept and bell tower, with a flat wooden roof, it belonged to the most simple three-nave churches, typical for the Central European area at that time; cf. VEIDER 1947, pp. 14, 15, ZADNIKAR 1982, pp. 147–151, LAVRIČ 2003 a, p. 53.

⁹ For the years 1361 and 1382 cf. *Epitome* 1714, pp. 42–45; VALVASOR 1689 *Die Ehre*, p. 688, cf. VEIDER 1947, p. 18 and fn. 15. For the years 1361 and 1386 cf. Viktor Steska, *Ljubljanska stolnica, NŠAL, ŽA, Ljubljana - sv. Nikolaj*, fasc. 22, essays - various; *Zgodnja Danica* 1854, pp. 47, where it is also recorded that it was already ravaged by the Turks in 1469.

¹⁰ Progressive stylistic Parlerian novelties were established with the construction of the Gothic presbytery: KOMELJ 1973, pp. 146, 150, 152, 154; CEVC 1984, p. 98, cf. LAVRIČ 2003 a, p. 54, fn. 260; PESKAR 2005, pp. 215–217 (catalogue no. 16), cf. also pp. 70–72, 177–178.

¹¹ More on the history and fittings of the old cathedral in Veider’s PhD thesis, and here to follow just the author’s condensed note: “Thus, in terms of its first, Romanesque, as also its second, “civic”, or its third “Friedrichian”, and finally its fourth, Hren’s, design, our cathedral appears to be a typical monument for its time and the cultural geographical territory to which Slovenia belonged in that period”, VEIDER 1947, p. 88.

¹² LAVRIČ 2003 a, p. 54.

¹³ CEVC A. 1990, pp. 114–116.

¹⁴ The wall and ceiling paintings of the Cathedral of St Nicholas are among the most extensive and complete illusionistic painterly works and “*.../ belong to Quaglio’s most important and mature work*”: LAVRIČ 2003 a, p. 59; cf. CANKAR 1920, p. 189; BERGAMINI



3d: Bishop Ferdinand Kuenburg; **3e:** in Perugia retired Bishop Žiga Kristof Herberstein; **3f:** the theoretician, architect and painter Andrea Pozzo and **3g:** the painter Giulio Quaglio.

Francesco Ferrata,²¹ Francesco Bombasi,²² Mihael Zamerl,²³ Andrea Pozzo. It was the dean’s great wish to attract the most distinguished Roman architect, painter and theoretician of the time, Jesuit Andrea Pozzo (1642–1709),²⁴ into a collaboration on the construction and painting. However, the latter was unable to accept the commission due to the extent of his painting obligations for the Jesuits in Vienna.²⁵ The dean’s correspondence even uncovered his wish for Pozzo to paint the illusionistic dome (*cupola finta*)²⁶ onto canvas according to conveyed measurements in Vienna, which would then be sent to Ljubljana in several pieces.²⁷ Nevertheless, the new cathedral was built with an ambitious

regard towards Rome between 1701 and 1707 (consecrated on 8 May 1707) following Pozzo’s concept,²⁸ influenced by Vignola’s Roman Jesuit Church of the Gesù.²⁹ It was built by builders Francesco Ferrata and Mihael Zamerl from 1701 to 1707, with Venetian Francesco Bombasi³⁰ replacing Ferrata in 1702. Two local builders also worked on the project; Pavel Jugovic,³¹ and after his death (1704), Gregor Maček.³²

After Pozzo’s inability to take on the commission for painting the new cathedral, the dean finally decided on Giulio Quaglio, who had gained his painterly repute through his paintings of churches and palaces in Friuli, and just at that point in time, also with his work in the parish church in Gorizia, today a cathedral (1702).³³

²¹ STESKA 1926, p. 177; SAPAČ 2007, p. 236 with reference to other literature.

²² STESKA 1925, p. 52.

²³ STELE 1960, p. 196.

²⁴ STELE 1949, p. 469; KERBER 1971; PRELOVŠEK 1995, pp. 209–210; SAPAČ 2007, p. 236 with reference to other literature.

²⁵ LAVRIČ 2003 a, p. 59. Pozzo was more interested in commissions in imperial Vienna than in Ljubljana: MUROVEC 2000, p. 26.

²⁶ Murovec writes that the dean was thinking already in 1702 about having the crossing of the naves surmounted by a *cupola finta* (DOLNIČAR 2003, p. 223; *Historia*, p. 5) and this was precisely why Pozzo seemed the most suitable for its implementation. The *cupola finta* represents Pozzo’s practical solution to the problem since it would be a “*depicted replacement for actual architecture*”, which could not be implemented; in the case of Ljubljana Cathedral, due to financial restraints, or at Sant’Ignazio (1691–1694) because of the complaints of the Dominicans at Santa Maria sopra Minerva, that the library would receive insufficient light, as Murovec cites Karner (KARNER 1995, p. 54); MUROVEC 2003, p. 105; MUROVEC 2006, p. 104.

²⁷ LAVRIČ 1996 b, p. 80.

In 1703 a decision had to be accepted regarding the implementation of the dome, for which Pozzo had produced two plans (a smaller dome for 10.000 and a larger one for 20.000 florins). However, due to financial restraints the decision rested on a temporary illusionistic dome. The opening for the dome was covered in massive beams and plastered. Quaglio painted this plastered wooden ceiling in six weeks with an illusionistic fresco: DOLNIČAR 2003, pp. 296–297. Murovec found that the painting of the illusionistic dome above the crossing of the naves was the first such work of Quaglio’s career: MUROVEC 2000, p. 26.

²⁸ “*.../ owing to Kuenburg, the famous Jesuit architect, painter and theoretician, Andrea Pozzo, uttered his final word. Also the following added to the image of the cathedral /.../*”: LAVRIČ 2003 a, p. 55. Pozzo did not change Florentiano’s plan very much, he only adapted the proportions and defined the interior more precisely, and added the essential novelty – the basilica model. Today, neither of the plans remain preserved – Pozzo’s original plan, which was probably used by construction workers, as also Florentiano’s plan: LAVRIČ 2003 b, p. 451. In Dolničar’s *Historia* some other surviving plans are published.

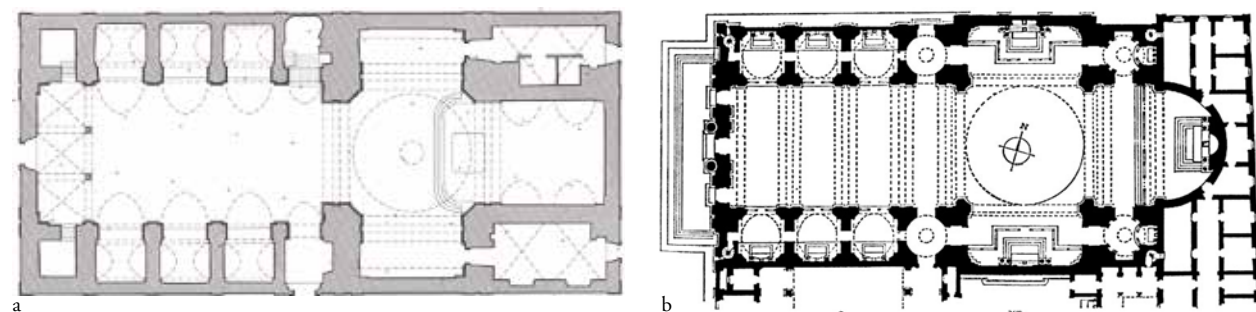
²⁹ Giacomo Vignola between 1569–1573 and Giacomo della Porta 1575–1584 (front): PEVSNER 1966, pp. 208–211; LAVRIČ 2003 a, p. 55.

³⁰ The dean “*.../ following the idea of the mentioned de Putti, and according to plans that the latter had sent, continued construction work with the help of Francesco Bombasi, a very able builder*”, writes Dolničar for the year 1702: DOLNIČAR 2003, p. 288. Venetian Bombasi who had moved to Ljubljana, lead construction work after Ferrata’s resignation (as an interesting point: in the inventory of Ferrata’s bequest there was also Pozzo’s *Perspectiva pictorum et architectorum*; cf. fn. 45 by Ana Lavrič in: DOLNIČAR 2003, p. 226) and divided the exterior according to his idea: LAVRIČ 2003 a, p. 55.

³¹ DOLNIČAR 2003, p. 299.

³² LAVRIČ 2003 a, p. 55 with reference to older literature, also SAPAČ 2007, pp. 246–247.

³³ Cf. BERGAMINI 1994, p. 168; ŠERBELJ 2002, pp. 192–194; LAVRIČ 2003 a, p. 55; QUINZI 2005 b, pp. 194–204. He began with the paintings of the ceiling, triumphal arch and the fields of both of the galleries above the side naves in 1701, and completed them in the late summer of 1702, when he received payment for 1.200 florins:



Figures 4a and 4b: Ground plans of the Cathedral of St Nicholas in Ljubljana (4a) and its model in Rome da Vignola's Jesuit church Il Gesù (4b).

One of the earliest records on painter Giulio Quaglio can be found in 1796, when Luigi Lanzi wrote about him in *Storia pittorica della Italia del 1796*: "In recent years the 'Comasco' named Giulio Quaglio prevails in fresco painting [...]. The young man that arrived in Friuli at the end of the last century [...] was incredibly active, thus it is very difficult to compile an overview of all of his works [...] what could be noted is the abundance of ideas, expertise with the paintbrush, and a flair for great compositions, which are necessary for certain success, not only in Como, but also in Milan."³⁴ In 1819 Fabio di Maniago³⁵ dealt with his oeuvre in more detail, although he concluded that Quaglio did not leave any lasting trace or influence with his painting. After a long period of tranquillity, Viktor Steska³⁶ began to deal with him, and then Izidor Cankar,³⁷ more precisely in his PhD thesis dated 1920. In the 1950s, Remigio Marini³⁸

BERGAMINI 1994, 168 ss; ŠERBELJ 2002, p. 193. He apparently received the Gorizia commission through the noble Strassoldo family, for whom he had painted the palace in Udine in 1693, and whose descendant belonged to the parish clergy. The frescoes on the ceiling and triumphal arch were heavily damaged, twice restored in 1834 and 1901, and destroyed during the war during the cannonading of Gorizia in 1915: CANKAR 1920, p. 80. Steska comments on the state of the Gorizia fresco in around 1903: "This painting was about to fall to pieces, five years ago a piece of the ceiling came off and with it an important part of the painting. The part that had fallen off was replaced, the whole painting was cleaned by ornamentalist Delneri": STESKA 1903, pp. 528–529. There is an old preserved photograph of the ceiling (with visible Quaglio's signature and date) from a time before the First World War, and a watercolour (127 x 63 cm) from the mid-19th century by A. Rotta, kept in the archdiocese: ŠERBELJ 2002, p. 193. Most recent findings in connection with the wall and ceiling paintings from Gorizia: BERGAMINI 2006, pp. 191–222.

³⁴ Luigi Lanzi, *Storia pittorica d'Italia* (1795–1796), 2, (ed. M. Cappucci), Firenze 1970, p. 170, mentions: CANKAR 1920, p. 79; BERGAMINI 1994, pp. 13–57; PERUSINI 2003, p. 380.

³⁵ Fabio di Maniago, *Storia delle Belle Arti Friulane*, Udine 1823 (1819), pp. 139–142, 259–262, mentions: CANKAR 1920, p. 77, BERGAMINI 1994, pp. 13–57; PERUSINI 2003, p. 380.

³⁶ STESKA 1903, pp. 486–490, 527–533, where he dealt thoroughly with Quaglio's biography (also: STESKA 1904, pp. 143–144).

³⁷ Following sources, Cankar set the date of the artist's birth and death in his dissertation, wrote about his second working visit in Ljubljana during 1721–1723, and was the first to popularise Dolničar's *Historia*: CANKAR 1920, pp. 77–84; CANKAR 1920, pp. 77–84, 131–137, 186–192, 240–245.

³⁸ Remigio Marini, Giulio Quaglio e gli inizi friulani, *Annali della Scuola Normale Superiore di Pisa*, s. 2, vol. 23 (1954), fasc. I–II, pp. 197–203; Remigio Marini, Giulio Quaglio ed il suo primo decennio in Friuli, *Arte Veneta*, 9 (1955), pp. 155–170; Remigio Marini,

studied his stylistic development in detail by looking at individual artistic phases, and finally in 1994, Giuseppe Bergamini handled the artist's life oeuvre as part of a monograph.³⁹

Giulio Quaglio (1668–1751)⁴⁰ was born in Laino in the Intelvi Valley near Como Lake. Laino was at the turn of the 18th century a small centre of the arts renowned for numerous families of painters, sculptors, stuccoworkers, decorators, who left in the summer months to pursue work abroad. One of those was also the Quaglio family. In the warm months of the year, they undertook painting commissions across Europe, returning home in the autumn months to commit to oil painting, which was quite typical for the painters from the northern parts of Italy. This type of lifestyle was determined by the need to survive, as well as the nature of the fresco technique itself. The young Quaglio probably received his first painterly instruction from his father and both uncles which, however, did not have any particularly significant influence.⁴¹ Mentioned as Quaglio's first teachers by biographers are Giovanni Battista Recchi⁴² in Como, and more important for his formation as a painter, painter Marcantonio Franceschini (1648–1729)⁴³ from Bologna. Master Franceschini is already highlighted by Dolničar, who reports that Quaglio was educated in schools in Parma, Piacenza and Venice. Cankar adds to Dolničar's list of Quaglio's

Giulio Quaglio. La maturità e la vecchiezza, *Arte Veneta*, 12 (1958), pp. 141–157; for references of remaining older literature: PERUSINI 2003, p. 380 and BERGAMINI 1994, pp. 13–57.

³⁹ BERGAMINI 1994. Most recent findings: BERGAMINI 2006, pp. 191–222; LAVRIČ 2006, pp. 349–355.

⁴⁰ After Steska, Cankar researched the artist's biography in great depth, and for the first time also drew up a consistent genealogy of the Quaglio family (CANKAR 1920, pp. 77–84), which was completed by Bergamini in his monograph: BERGAMINI 1994, p. 358.

⁴¹ Cankar writes that the three brothers, the father Giovanni Maria, and both uncles, Giulio and Domenico, were represented by a kind of "painting co-operative, which was preserved until the time of our master's grandchildren" and worked for the imperial court in Vienna, and later also for the courts in Monaco and Mannheim": CANKAR 1920, p. 77; CANKAR 1952, pp. 609–610.

⁴² Recchi is cited as a teacher by: CANKAR 1920, p. 79, who cited the older: LANZI 1822, pp. 224–225; THIEME, BECKER 1912, p. 494; STESKA 1903, p. 487. The Perusinis cite also di Maniago: PERUSINI 2003, pp. 380–382.

⁴³ According to Dolničar's *Historia*, p. 65; others: THIEME, BECKER 1912; STESKA 1903, p. 490; CANKAR 1952, p. 610; BERGAMINI 1994, p. 19; DOLNIČAR 2003, pp. 305–306.

great influences, Correggio, Carracci, Tintoretto, including also Tiziano and Veronese,⁴⁴ with Bergamini adding the influence of Cignani, Canuti and Pasinelli, and in particular Franceschini.⁴⁵

"Quaglio thus belonged to the late eclectic school of painting, marked by the collection and appropriation of tested forms that remained in force as beautiful and their use in creating one's own compositions, wherein the artist's main goal was to create independent formations using old elements [...]. Apart from this basic Baroque principle and method, Quaglio also took on the 'fa presto' virtuosic technique of Pietro da Cortona from the Italian fresco painters of the 17th century, which he learned indirectly through Cortona's admired student, Luka Giordano, when he was staying in Venice. Quaglio was a superior draftsman of hard strokes, a painter of a very pleasing and warm colour palette and sturdy plasticity, incredibly skilled and swift in sharp conceptualisations of great compositions, undergoing a steady development in the latter from the early, still high-Renaissance Venetian crumbled decorative methods, to mighty, uniform compositions based on uniting spatial, figural and colour elements, by which he attained his greatest level of perfection in the first phase of the frescoes of Ljubljana cathedral. In terms of his artistic significance, Quaglio considerably outgrew his local area of northern Italy, whereas in Slovenia he became the strongest representative of Baroque church painting. As such, he had a fruitful effect on descendants of Slovenian art, particularly our last Baroque fresco painter, Jelovšek",⁴⁶ goes Cankar's description of Quaglio's painting, which refers to Dolničar's insights in *Historia* and still today represents a basic definition and starting point for research within the art historical profession.

Quaglio at first worked in his native land, between 1692 and 1700 in Venetian Friuli, then the decade to follow in the lands of the emperors (Gradisca, Gorizia, Ljubljana, Puštal near Škofja Loka, Trieste, Graz [Meerscheinschlössl], Salzburg [Schloss Klessheim]), in Lombardy again from 1710 to 1720, after a short spell in Ljubljana (1721–1723) and Obršljan near Komen (1724), finally returning to Lombardy, where he spent his last creative period (1723–

⁴⁴ CANKAR 1952, p. 610.

⁴⁵ BERGAMINI 1994, p. 19.

⁴⁶ CANKAR 1952, p. 610 and CANKAR 1920 with citations of older literature. More on painting at the turn of the 17th/18th century in the following essential contributions: VURNIK 1928, pp. 1–18; STELE 1938, pp. 25–27 and the most recent: MUROVEC 2006, pp. 106–110.

1733).⁴⁷ He died in 1751 in his home town of Laino, at the age of eighty-three.⁴⁸

The cathedral dean with his organisation committee therefore entrusted the wall and ceiling paintings of Ljubljana Cathedral to the fresco painter from Lombardy, who embarked on the painting of one of the most extensive fresco works in Slovenia at the age of thirty-five, which also represented his most important art commission.⁴⁹

Quaglio arrived in Ljubljana from Laino on 30 April 1703⁵⁰ and signed his first contract with the dean on 2 May.⁵¹ He completed the whole of the wall and ceiling paintings⁵² with his assistant and first proper student, the sixteen-year-old Carlo Carloni (1686–1775) between 1703 and

⁴⁷ Quaglio's creative oeuvre is mainly represented by wall painting commissions for the aristocrats and the church in Friuli. It is divided into three periods. Following Cankar's chronological definition there is the Udine period, the second painting period in the Habsburg monarchy territory, and the later period when his workshop produced painting commissions with his signature (region of Bergamo, Brescia, Como): CANKAR 1920, pp. 77–84. The most recent chronological arrangement: BERGAMINI 1994, pp. 13–57; cf. ŠERBELJ 2002, pp. 192–194.

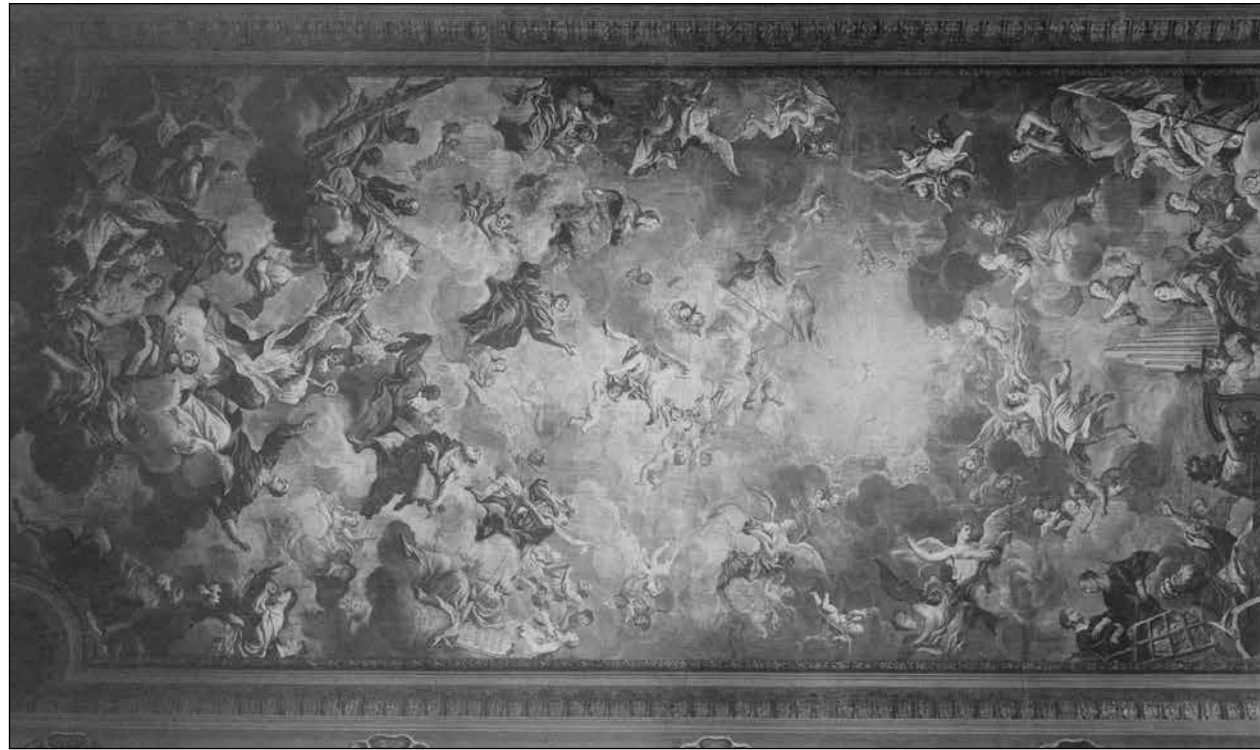
⁴⁸ CANKAR 1920, p. 84. Steska cites throat cancer as the cause of death: STESKA 1903, p. 529.

⁴⁹ Count Francesco Lanthieri (for the role of the Lanthieris see: QUINZI 2005 b, pp. 194–204 and QUINZI 2003–2004, pp. 367–372) and Carniolan nobleman Johann Andreas Coppini, who knew Quaglio personally, invited the painter to Ljubljana upon the dean's request: LAVRIČ 2003 b, p. 463 (according to the dean's *Accepta et exposita* 1700–1713); cf. CANKAR 1920 (fn. 14), p. 487. In her note, Lavrič implies the possibility that the dean decided on Quaglio because of his nephew Aleš Žiga who was studying in Gorizia during the time when Quaglio was painting, what is today, the cathedral: LAVRIČ 2003 (fn. 28), p. 463.

⁵⁰ STESKA 1901, p. 143; DOLNIČAR 2003, p. 293.

⁵¹ By signing a contract in 2 May 1703 he made a commitment, in exchange for 220 florins and free of charge accommodation and food for himself and his student, to depict images in the presbytery, transept, dome and the area below it, as well as on the exterior: LAVRIČ 2003 b, p. 463 and fn. 121 with references to sources and literature.

⁵² He painted the presbytery, the chapels of St Dismas and the Corpus Christi and the transept, dome, sacristy, three frescoes on the exterior, the nave vault, the western wall. More on Quaglio's wall and ceiling paintings in Ljubljana Cathedral (with a review and description of the depicted scenes, which are not individually listed in this writing) in parts, which are mostly founded on Dolničar's *Historia*: Alojzij Stroj, manuscript *O stolnici*, Archiepiscopal Archives, Ljubljana (= NŠAL, ŠAL/Zg. zap., fasc. 2); STESKA 1903, pp. 486–490, 527–533; CANKAR 1920, pp. 77–84, 131–137, 186–192, 240–245; BERGAMINI 1994, pp. 172–191; LAVRIČ 2003, pp. 59–62; DOLNIČAR 2003, pp. 321–326 (*Historia*, pp. 157–168) and LAVRIČ 2007.



a



b

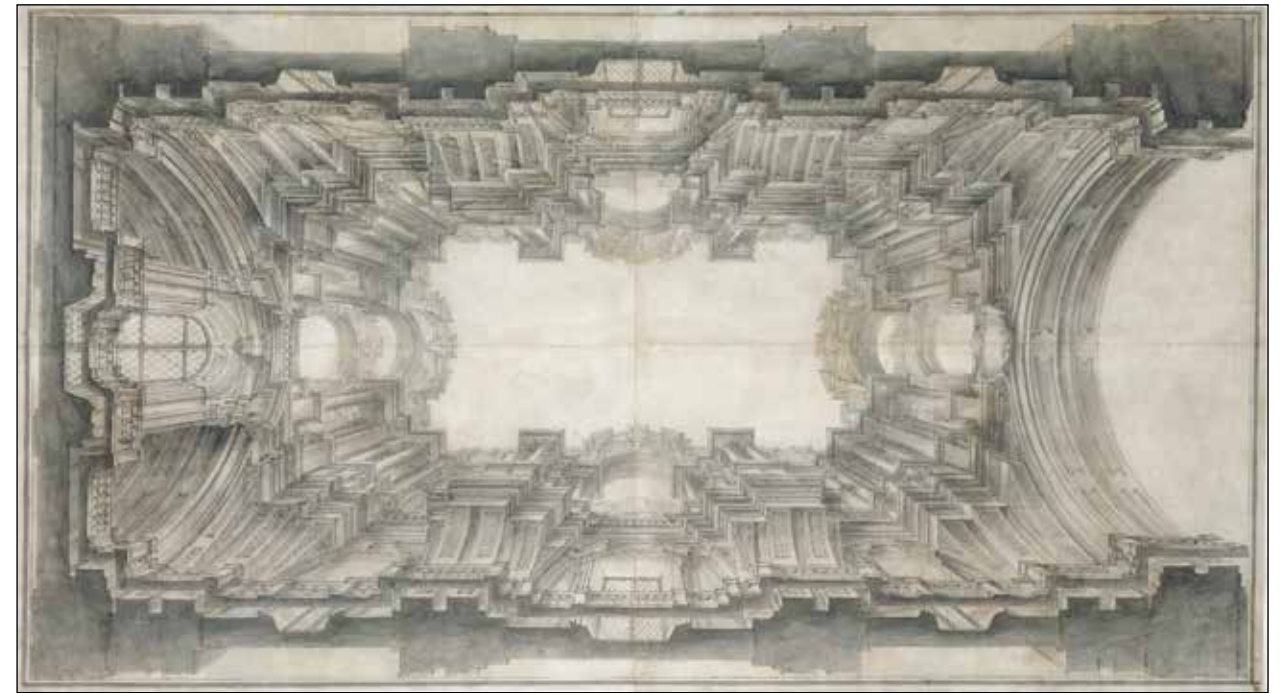
Figures 5a–5d: Comparisons of the illusionistic nave vaults and the development of Quaglio's notion of perspective illusionism

5a: Quaglio's painted nave vault (1702) of the Gorizia Cathedral prior to destruction.

5b: Quaglio's illusionistic monumental decoration on the nave vault of Ljubljana Cathedral, 1705–1706.



c



d

5c: Pozzo's mastery in ceiling illusionism in the church of San Ignazio in Rome, 1691–1694.

5d: Thus far, none of Quaglio's preparatory drawings or cartoons for the painting of Ljubljana Cathedral have been found, however, Pozzo's preparatory drawing of the illusionistic architecture (1685–1690) for the nave vault in San Ignazio does remain preserved.



Figures 6a–6b: The interior of the Gorizia Cathedral prior to its destruction during the First World War: a view in the direction of the presbytery (6a), and the scene with typical Quaglio's angels on the arch wall (6b).

1706,⁵³ for which he was paid 4685 fl. 26 kr.⁵⁴ The paintings of the chapels and the lower area of the transept⁵⁵ were executed together with his son Raffaele and assistants on his second working visit to Ljubljana (between 1721–1723), when he was in 1721 summoned to execute

the illusionistic wall and ceiling paintings in the Seminary Library.⁵⁶

If we place a special focus on the beginnings of the wall and ceiling paintings on the nave vault on the western side, by means of the contract signed between the painter and dean on 24 November for the year 1705, we find that for a payment of 2000 florins of German value and 50 gold coins, the painter's job was to execute a fresco mural on the nave vault "I.../ with the story of St Nicholas encouraging his followers to martyrdom, and architecture according to the painter's conception, continuing also to the inside of the

⁵³ Carlo Innocenzo Carloni was a painter from an artistic family from near Como in northern Italy – more on him and along with other literature is cited by Lavrič in fn. 501: DOLNIČAR 2003, p. 293.

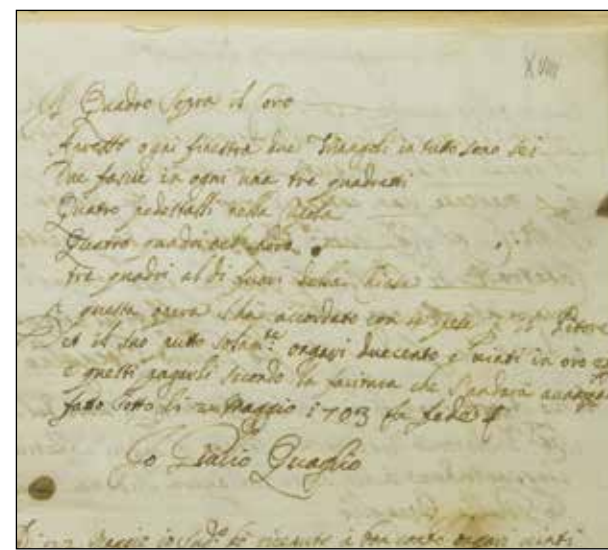
The exception is the year 1703, when Dolničar mentions that Quaglio was returning to Laino at the end of the year with Carloni and four other students: DOLNIČAR 2003, p. 298 (*Historia*, p. 130). Here, new findings in relation to Dolničar's interpretation of the text should be noted: "I.../Dolničar uses two different terms for students, however, not so as to imply their position of hierarchy in the workshop (cf. BERGAMINI 1994, pp. 14, 174), but rather to distinguish Carloni, Quaglio's student, from the students or pupils who, as it seems, travelled with him part of the way, possibly from Gorizia, where some people from Ljubljana studied I.../": LAVRIČ 2006, p. 354, fn. 26.

⁵⁴ LAVRIČ 2003 b, p. 476 (*Accepta et exposita*, p. 116, according to *Historia* appendix XVIII), cf. DOSTAL 1912, p. 400; STESKA 1934/35, pp. 143–144.

⁵⁵ The painterly ornamentation of chapels was, judging by the lower quality wall and ceiling paintings, probably carried out together with his son Raffaele and other assistants: STESKA 1904 a, pp. 143–144. More on the wall and ceiling paintings in the chapels: SMOLE 1973, SMOLE 1982 and LAVRIČ 2007, pp. 82–96. Mikuž, among the assistants of this period, also mentions Jelovec: MIKUŽ 1939/40, pp. 1–61; MIKUŽ 1942, pp. 36–42, 111–116, 180–186, 273–282. Murovec highlights that "Quaglio was arguably not a great teacher with whom Jelovec would have spent several years (1726–1729) and then return to Ljubljana brimming with ideas in order to take on a demanding task, such as the wall and ceiling paintings of the Church of St Peter.", MUROVEC 2003, pp. 137–138, since Quaglio supposedly did not even have his own school of painting; cf. fn. 53.

⁵⁶ The opinion prevailed that his son Raffaele helped with his extensive workshop activities from 1716 up till 1732, when he apparently died: CANKAR 1920, p. 84 according to the *Liber mortuorum* from Laino parish and according to a document from the Ljubljana Chapter Archive on the ceiling paintings of the Seminary Library (he was due to paint the ceiling for 500 florins with his son Raffaele in August 1721). The document was researched and published by Steska, therefore inferring as to the painterly role of Raffaele (chapter records *Protocollum Capituli Labacensis* IIII, p. 445): STESKA 1904, pp. 143–144; likewise, according to Cankar's opinion, the frescoes were executed under the guidance of Giulio Quaglio by his sons and students: CANKAR 1920, pp. 82–83, 190, 234; BERGAMINI 1994, p. 14 and pp. 250–253.

In his thesis, Cankar wrote that given the documents (Quaglio's own book: *Registro di me Giulio Quaglio 1748* (the number eight is difficult to make out), which contains the painter's dairy entries, e.g. details on income from his estate and expenses for the house, among which there are sums paid to him by his students) Quaglio had his own painting school (CANKAR 1920, p. 245, fn. 9), which is according to Murovec refuted by Bergamini (BERGAMINI 1994, p. 35 ss), since Carloni studied in Venice during the *dead season*, and not in Laino: MUROVEC 2003, pp. 137–138 and BERGAMINI 1994, p. 19. It must be noted that the comment on the possible painting school refers to Quaglio's later painting period.



Figures 7a, 7b: The contracts for the decoration of Ljubljana Cathedral, concluded between the dean and the artist.

7a: Contract for the presbytery, transept, dome and the exterior on 2 May 1703.

7b: Contract for the nave vault together with the western wall on 24 November 1704.

western wall with paintings by the big frontal window and above the main entrance.⁵⁷ From Quaglio's letter⁵⁸ to the dean dated 9 February 1795 it is clear that he had been working on plans for painting the nave vault at home during the winter months. On 10 May, after returning to Ljubljana, he first finished the painting at the altar of the Corpus-Christi and then began painting the nave vault. The illusionistic vault fresco of the main nave and western wall was executed in two (summer) seasons in two years (in approximately nine months): from 10 May to 12 October (according to *Accepta et exposita* and 9 October according to *Historia*) in 1705, and from 11 April (according to *Accepta et exposita* and 10 April according to *Historia*) until at least 22 August of 1706. As the Dolničar brothers report (in *Historia* and *Accepta et exposita*), it was Quaglio's intention to complete the nave vault already in 1705, but he was taken ill and had to return home in October.⁵⁹ He came back in 1706 together with Carloni, who had "been attending studies in drawing at the academy"⁶⁰ in Venice over the winter.

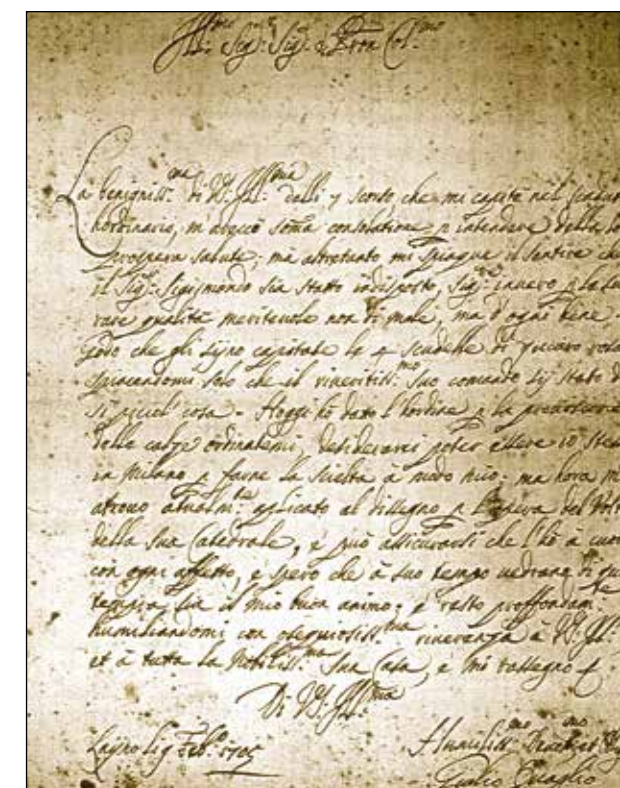


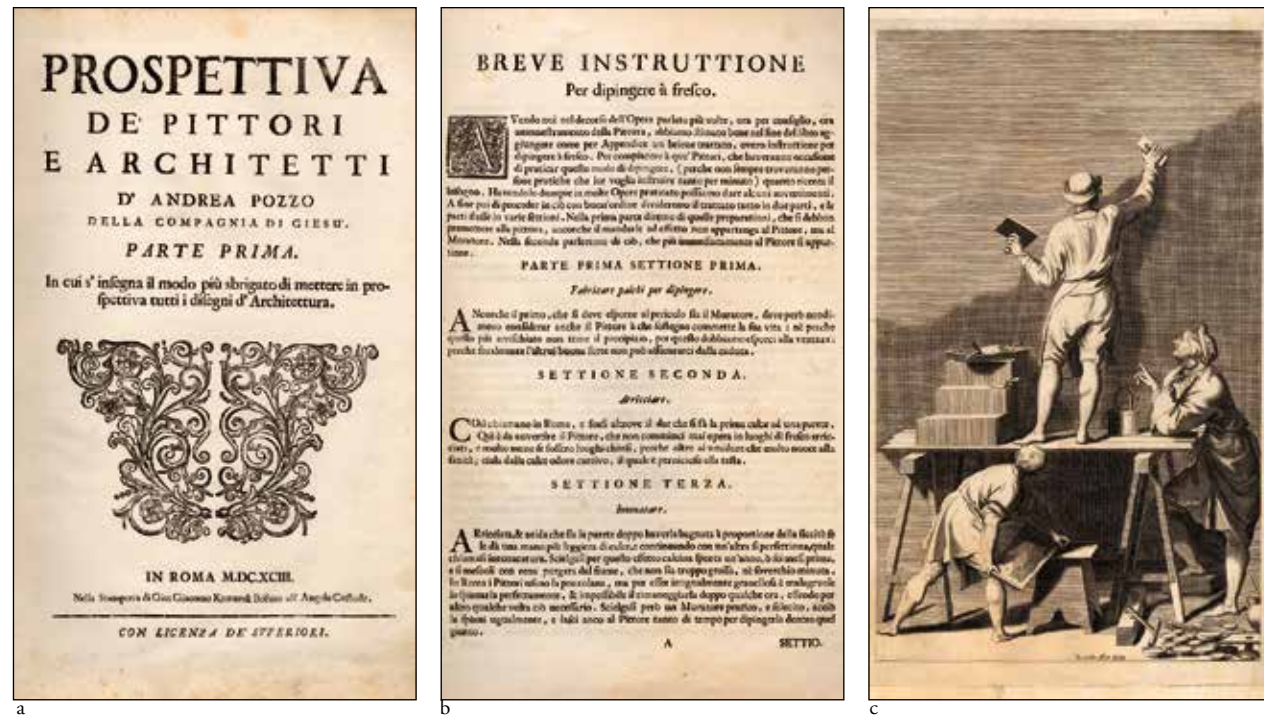
Figure 7c: Quaglio's letter to Dean Anton Dolničar on 9 February 1705 from Laino, in which he says that he is creating a plan for the painting of the nave vault.

⁵⁷ In the same contract he also committed himself to painting a frame to the altar of the Corpus-Christi chapel: LAVRIČ 2003 b, p. 466 (*Accepta et exposita*, p. 114; *Historia*, appendix XVIII); cf. DOSTAL 1912, p. 399; STESKA 1934/35, p. 143.

⁵⁸ LAVRIČ 2003 b, p. 470. The letter is today stored at NŠAL, ŠAL/Zg. zap., f. 2; first published by STESKA 1933, p. 120, then: LAVRIČ 1996 b, p. 85.

⁵⁹ Dolničar wrote in *Historia* that he fell ill with a fever, which kept returning every fourth day, even though a letter arrived after he returned home saying that he was well again after only two days: DOLNIČAR 2003, p. 308.

⁶⁰ DOLNIČAR 2003, p. 309 (*Historia*, p. 147); CANKAR 1920, p. 81.



Figures 8a, 8b, 8c: Pozzo's *triestinae Perspectivae pictorum atque architectorum*, I–II, Roma 1693 and 1700.

8a: the title page; 8b: a chapter containing instructions on how to paint frescos: *Breve istruzione per dipingere à fresco* and 8c: a portrait of the painter with a mason and an assistant.

"Again he embarked upon the painting that he had left unfinished the previous year, whereas his student Carloni painted three dials as big as ten feet on the tower facing the square."⁶¹

On 19 July 1706 (according to *Historia*) the construction of beams and wooden supports was removed and the whole of the nave could be seen for the first time.⁶² The western wall was completed by 21 August 1706, with the lower chapels remaining unpainted. Already on 22 August 1706 the first ceremony was underway and the Corpus-Christi was taken to its new sanctuary.⁶³ On 8 May 1707 the official consecration ceremony was celebrated.⁶⁴

In terms of theme, all scenes of the St Nicholas interior are connected to one another and present a whole in content and design. They are dedicated to the glorification of its patron saint, St Nicholas of Bari, and the founding of the Ljubljana diocese.⁶⁵ The visual scenes of Nicholas' legends in the cathedral are based on the book *Flos sanctorum* by the Spanish Jesuit priest Pedro de Ribadeneira from 1599,⁶⁶ whereas in personifying characters, Quaglio referred to

the essential source of iconography for Baroque artists, the *Iconologia* (Rome, 1593) by Cesare Ripa.⁶⁷ The visual content was probably decided upon by the dean together with his closest supporters, most probably his brother Gregor Dolničar⁶⁸ and cathedral provost Janez Krstnik Prešeren,⁶⁹ "but the painter himself also helped to create it."⁷⁰ According to Lipoglavšek, the content was determined in advance, like in Quaglio's most extensive profane fresco cycle in the Antonini-Belgrado Palace in Udine.⁷¹ However, not much is known about Quaglio's actual collaboration in the conceptualisations for the wall and ceiling paintings. It can only be ascertained from *Accepta et exposita*, *Historia*, contracts

⁶¹ LAVRIČ 2003 a, p. 60.

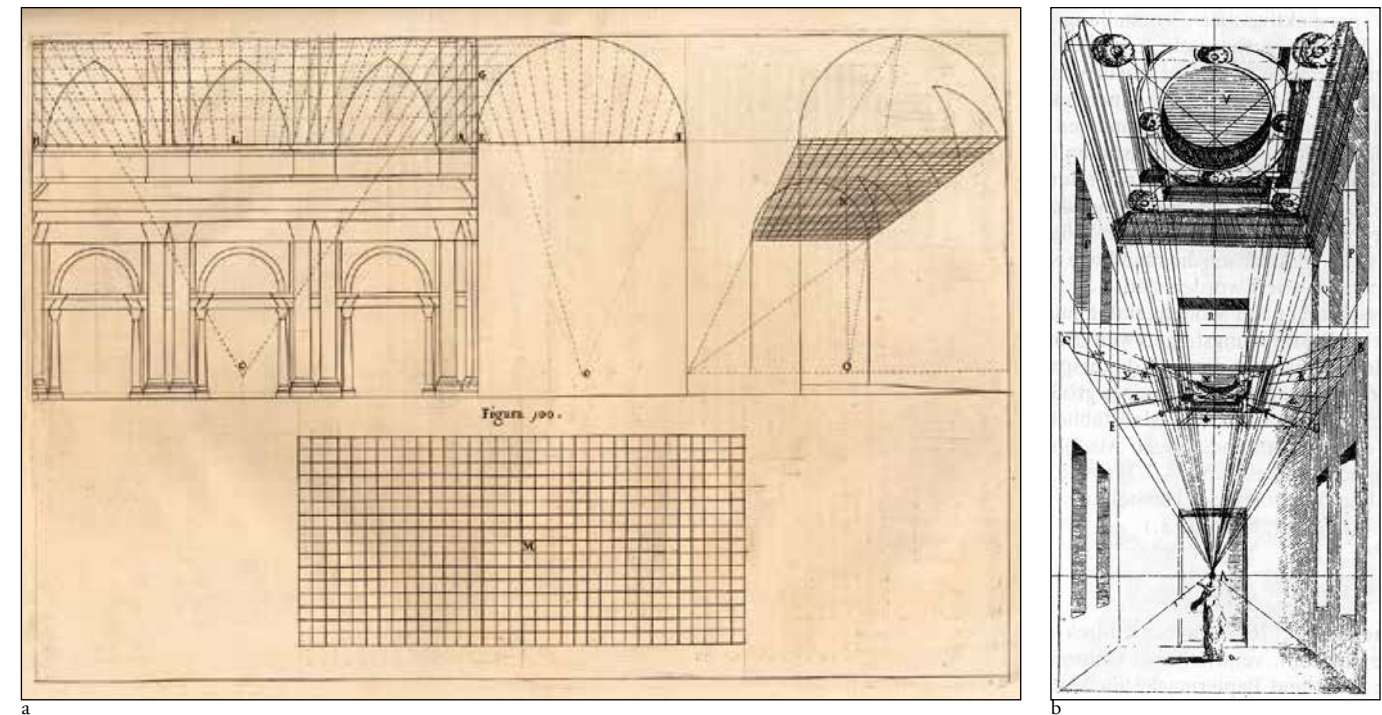
⁶² He worked with the dean throughout the course of construction, preparing decorative concepts for the edifice and festivities to go with the completion of the new building: LAVRIČ 2003 a, p. 46.

⁶³ More on Prešeren as the dean's great supporter: KOPRIVA 1989, p. 237 and his participation in the contents of the painting programme: LAVRIČ 2003 a, p. 59. Lavrič presumes that a portrait of Prešeren can also be seen on the fresco behind the organ (*St Nicholas Being Elected as Archbishop in Myra*), next to the portraits of Kuenburg and the dean: LAVRIČ 2003 a, p. 60; LAVRIČ 2007, p. 81.

⁶⁴ LAVRIČ 2003 a, p. 59. An important piece of information that hints at the painter's participation in the painting programme is published by Lavrič according to documents by Anton Dolničar. On 7 June 1704 Quaglio "made an agreement to paint a frame for the high altar and the altar of St Dismas, a fresco on the vault of the sacristy (motif remained undefined when the contract was signed, which makes it possible that the painter also participated in terms of the concept and content of the wall and ceiling paintings), and depictions of four cardinal virtues under the pendentives of the illusionistic dome." LAVRIČ 2003 b, p. 466.

⁶⁵ DOLNIČAR writes in *Historia*: DOLNIČAR 2003, p. 322–323; cf. STESKA 1903, p. 530; ZALAR 1969.

⁶⁶ LIPOGLAVŠEK 1996, pp. 66–67.



Figures 9a, 9b, 9c: The methodology of painting perspectival illusionism.

9a: Pozzo's transfer of a drawing onto a longitudinal vault with the help of a square grid from: POZZO 1693–1700, fig. 100.

9b: Bibiena's construction of the ceiling in architectural illusionistic painting (*quadratura*) from: GALLI BIBIENA 1711.

9c: The picture with a self-portrait of the Baroque painter Michael Wenzel Halbax from 1710 during the creation of a draft composition shows typical tools used in painting: the painted three-dimensional "modello" for the illusionistic dome following Pozzo's treatise, the palette and paint brushes, a manual or a book of studies and a preparatory drawing.



⁶¹ DOLNIČAR 2003, p. 312 (*Historia*, p. 152).

⁶² DOLNIČAR 2003, p. 312 (*Historia*, p. 152).

⁶³ Janez Anton Dolničar states in *Accepta et exposita* that he worked 20 weeks in 1706. Whereas Janez Gregor Dolničar reports in *Historia* that: "Giulio Quaglio did /.../ on 21 August 1706, along with all the excited onlookers, finish /.../": DOLNIČAR 2003, p. 313 (*Historia*, p. 154).

⁶⁴ KOPRIVA 1989, p. 19; LAVRIČ 2003 b, p. 479.

⁶⁵ LAVRIČ 2003 a, p. 59.

⁶⁶ Dolničar writes in *Historia*: DOLNIČAR 2003, p. 322–323; cf. STESKA 1903, p. 530; ZALAR 1969.

⁶⁷ LIPOGLAVŠEK 1996, pp. 66–67.

and the dean's correspondence that he was given a freer reign in designing the mural of the illusionistic dome (according to the contract dated 7 July 1703),⁷² and the architectural background in the paintings of the nave vault (according to the contract dated 24 November 1704) and the scene on the western wall.⁷³

On the nave vault, stories of three spheres, linked to the same epilogue, unwind on three levels, which are now no longer separated by decorative stucco frames, like in the first part of the cathedral, and like in most examples of Quaglio's oeuvre up till then. The high regard and aim to get closer to perspectival illusionism, the established painterly principle of the time, felt by Quaglio, provided him – together with his ability and experience with the techniques and technologies of Baroque painting up till then, his numerous wall and ceiling paintings in Friuli, as well as the actual execution of the illusionistic paintings on the vault of, what was then still, the Parish Church of St Hilarius and St Tatian in Gorizia – with that crucial knowledge, skill, experience and expertise that enabled him to paint the whole of the barrel vaulted nave in Ljubljana as a uniform whole, as if it were a great illusion on about 530 m², intended to be viewed from a distance of twenty metres.⁷⁴

The illusionistic painting technique makes the space appear real. It seems as if the space above, the new architecture, and above it the vault of heaven on the nave vault, continue beyond. He painted the height of space with architecture, figures and other attributes by using optical shortening, blending shades of light and colour as well as appropriate light and colour compositions, adapted choreography of figures' movements and figural compositions, as well as other principles of geometry, which had become established in European painting through painting tradi-

tion and treatises,⁷⁵ from the beginnings of perspectival illusionism, and through to Quaglio's time.⁷⁶

The earth level, with architectural backdrop incorporated into the composition, presents the story of St Nicholas, who – during the Diocletian and Maximianus persecution of Christians in Myra – encourages the faithful to martyrdom with his gesture pointing to the scene of The Victory of the Holy Cross, which runs parallel. Here is a vision of a hovering Saviour on the cross, somewhere between earth and heaven, carried by the angels and accompanied by a personification of Faith.⁷⁷

On the final level, towards which the composition with the cross also glides, the view in the highest point of the illusionistic painting opens out to God Father in his heavenly glory, promising the crucified, as well as all martyrs, eternal salvation. Basic events are accompanied by angels, cherubs, the twelve apostles, the virtues at the top, and antique busts in lunettes, female prophets in medallions, prophets on depicted triumphal arches, flowers and other Baroque ornamentation. On the western wall scenes from the legend of St Nicholas can be found: St Nicholas Appears to the Robbers by the large frontal window on the left, and A Vandal Attacks the Image of St Nicholas on the right. Under the window behind the organ above the main entrance there is also St Nicholas Being Elected as Archbishop in Myra, with a portrait of Dean Janez Anton Dolničar.⁷⁸

⁷⁵ According to theoretical lessons on perspective in painting for example: ALBERTI 1970; PIERO DELLA FRANCESCA c. 1984, CENNINI 1982; VASARI 1568; BAROZZI, DANTI 1583; POZZO 1693–1700; a particularly important painting handbook for the Slovenian arena of the later period should also be mentioned: DECKER 1711–1716 (a discussion on Quaglio's actual influences and models for his type of illusionistic painting demands more in-depth study).

⁷⁶ For gaining an insight into the foundations, development and traditions of illusionistic painting in Slovenia for example: CANKAR 1920; STELE 1938, pp. 25–27; CEVC A. 1990; LIPOGLAVŠEK 1983 pp. 15–47; LIPOGLAVŠEK 1996; MUROVEC 2003; MUROVEC 2006 and foreign: VOLKELT 1919; PANOFSKY 1924/25; FREY 1946; BLUNT 1959; GOMBRICH 1960; GOMBRICH 1973; KARNER 1995; on the theory and development of perspective also: W. M. Ivins, D. Gios-effi, J. White, H. Geiger, G. Schöne, C. Goldstein.

⁷⁷ LAVRIČ 2007, p. 79.

⁷⁸ The main scene of the nave ceiling partially relates to sheet 637 from *Flos Sanctorum* by Pedro de Ribadeneira, according to which Gregor Dolničar described the scene in *Historia* (p. 165): DOLNIČAR 2003, p. 325. More precisely on the contents of the scenes: LAVRIČ 2007, pp. 71–82, where the various allegorical figures on the nave vault, which remain unresolved in terms of iconography, are now more clearly defined by frames (the scenes in the cathedral require further study of iconography).

⁷² LAVRIČ 2003 b, pp. 464: *Accepta et exposita*, p. 113; *Historia*, appendix XVIII; cf. DOSTAL 1912, pp. 398–399; STESKA 1934/35, p. 143.

⁷³ For the scenes on the western wall: LAVRIČ 2003 a, p. 60. "The frescoes of Ljubljana Cathedral represent a complex theological and historical cycle, which the painter depicted according to the instructions of Dean Anton Dolničar": BERGAMINI 1994, p. 174. More on the themes of the scenes in Ljubljana Cathedral: LAVRIČ 2007.

⁷⁴ Quaglio had used a similar principle of perspectival illusionism for the last time in Graz, when executing *The Victory of Christianity over Paganism* painting on the ceiling of the great hall in Meerscheinschloss in 1708; cf. CANKAR 1920, p. 189; BERGAMINI 1994, pp. 197–200.

Presentation of the project

Rado Zoubek



Presentation of the project

Rado Zoubek



Figure 1: During construction of the restoration scaffolding (24 October 2002).

The interdisciplinary project of renovating the wall and ceiling paintings of Giulio Quaglio (1668–1751) produced in 1705 and 1706, situated on the vault and the western wall of the Ljubljana Cathedral of St Nicholas, lasted four years' (2002–2006) and can be, alongside other projects run concurrently by the Institute for the Protection of Cultural Heritage of Slovenia (IPCHS) Restoration Centre (renovation of the Robba fountain), ranked among the more demanding and extensive tasks in the history of the institution.

Conservation-restoration project preparations were begun in 1997 with photogrammetric measurements of the interior and exterior of the church building, as well as thermographic images of the painted walls,¹ which were later supplemented using the latest technology.²

Besides standard procedures in the renovation of the wall paintings, the project brought some new approaches to the Slovenian arena, particularly in everyday restoration practice using certain methods and materials,³ which had up till that point been used more extensively abroad.⁴ The material that was produced along with the restoration work was presented to the expert and general public through the media.

¹ Tecno futur service, *Analisi Termografica Sugli Affreschi Della Volta Centrale, Ljubljana* 28 October 1997.

² SER.CO.TEC., *Termografska, magnetoskopska in endoskopska preiskava stropa stolnice sv. Nikolaja v Ljubljani – Slovenia*, 26 July 2001–25 July 2006, Legnano 2006.

³ Cf. paper by Marta Bensa, *Report on the initial cleaning and consolidation procedures*.

⁴ Cf. paper by Giovanna Nevyjel and Claudia Ragazzoni, *Final report on the cleaning*.



Figure 2: Traces of greater damage on the paintings on the western wall (5 December 2002).

Restorers, who during the four years gradually removed various layer of impurities and overpaints that had formed in the three hundred long years on the surface of Quaglio's wall and ceiling paintings using numerous conservation-restoration methods and techniques, certainly deserve the greatest credit for the quality of work performed. An invaluable contribution came from the close collaboration with the Natural Sciences Department of the Restoration Centre, where all cleaning procedures were overseen in terms of analyses, problematic coatings were investigated and the reasons for changes that had occurred in the pigments were determined.⁵

Alongside restoration work, more expansively conceived investigative work was proceeding on the history of the wall and ceiling paintings.⁶

The project was overseen by both an expert and a consultation committee, made up of eminent local and foreign specialists.⁷

⁵ Cf. Polonca Ropret, *Investigations of colour layers*.

⁶ Cf. Mateja Neža Sitar, *The history of the restorations of wall paintings and SITAR 2004–2006 b*.

⁷ The names of the members of both committees are listed on the end of the subscription.

PROJECT PRESENTATION

In 1703 and 1704 Giulio Quaglio decorated the surfaces of the presbytery and transept of the newly constructed church building. In the following two years (1705 and 1706) he continued with his work on the higher lying vault and the western wall of the nave.

The object of the conservation-restoration treatment at this time was the renovation of these painted surfaces ranging almost 600 m² in size, and more than 120 m² of accompanying decorative surfaces in the region up to the cornice.

Initial examinations of the condition of the wall and ceiling paintings and plasterwork began at the end of 2002, with the erection of a work platform and two scaffolds. Before treatment, all painted surfaces were documented using photographic and video documentation. The first tests were performed on removing dust, soot and other surface impurities. Representative samples of colour layers and the top layers of intonaco were taken. We were able to assess by looking at the typical signs that most of the painted surfaces were depicted in the buon fresco technique, and smaller areas were probably inpainted in one of the secco techniques. We also noticed traces of previous restoration treatment, particularly darker emphasised contours; some places had been noticeably overpainted. The cracks on the vault, western wall and accompanying surfaces could be classed into two groups. Those deeper ones that went through the plasterwork into the structure of the building itself, to which the longitudinal cracks on the apex of the vault and the wide cracks on the western side mainly belonged, and the second group, which contained only superficial cracks similar to craquelure. Due to meteoric water and consequential salt secretion, flaking of the colour layers and plasterwork beneath could be noted, particularly in the north-western part above the organ. The whole surface of the vault and the western wall was covered with a layer of soot, dust and other impurities. In the same way scaling of tiny colour particles could be observed along the whole of the surface. Areas of darker colour stood out especially on the faces (cheeks, lips) of the depicted figures. Along the edges of the giornate, flaking of the colour layer and a darkened retouch could also be observed.

On the basis of these preliminary examinations and investigations, a programme of conservation-restoration was produced at the beginning of 2003.⁸ The programme

⁸ Presented are the basic points of the conservation-restoration programme, which was presented to the public at the press conference marking the official start of the project on 21 January 2003.



Figure 3: Archbishop Dr. France Rode's address to press conference participants (21 January 2003).



Figure 4: Press conference to present the project's official start (21 January 2003).



Figure 5: Mechanical removal of impurities (13 February 2003).



Figure 6: Presentation of work done to the committee members (5 June 2003).



Figure 7: UV image of areas where cracks had occurred (30 June 2003).



Figure 8: Examination of the surface of the wall and ceiling paintings (23 September 2003).



Figure 9: First viewing of the wall and ceiling paintings by Italian restorers (17 November 2003).



Figure 10: Jürgen Pursche during a conversation with the team on the scaffold in the cathedral (18 November 2003).

anticipated that work would be divided into four subject areas, as follows:

1. Documentation which would include collecting photographic, video and printed material of the condition before treatment, research of archive data, literature, as well as studying the documentation on previous treatment. The production of an art historical study on the origins of Quaglio's wall and ceiling paintings and compilation of a system of documentation on the treatment was foreseen. Before work was begun we planned to transfer the photogrammetric grid of quadrants onto the paintings of the vault with cross signs. The collection and inclusion of data continued throughout the project.

2. Investigations would be divided into two groups, one focusing on investigations of the building construction as the support to Quaglio's wall and ceiling paintings, and the other investigating the plasterwork and colour layers, by which more information could be obtained about Quaglio's painting technique.

The first group encompassed thermographic investigations that had already been performed (1997 – "Tecno futur service", Modena), a static assessment of the cracks would be performed (FA Ljubljana), monitoring of the stability of the building construction by using sensors to measure micro-stretching of the cracks of the nave vault, monitoring of micro-climatic conditions by using sensors to measure humidity, temperature and temperature-related expansion, as well as additional thermographic and magnetoscopic investigations with state-of-the-art equipment (SER.CO.TEC. Trieste).

The second group contained the anticipated investigations of the components and structure of the plasterwork, examination of painting techniques – fresco and secco –, finding out about the number and forms of workshops, and determining possible overpaints, retouches and reconstructions.

The aim of using scientific investigations to examine the condition of the wall and ceiling paintings was to find out the causes for the damage to the colour layers, lifting of the plasterwork, to determine the exact reason for the efflorescences on the surface of the paintings, and to define the types of darkened pigments in the filled cracks and darkened parts of the incarnate (cheeks, lips). Scientific investigations of the materials used in previous restoration procedures were also included into the anticipated scope of investigations.

3. The interpretation of investigation results would alleviate work in diagnosing damage, ease selection of restoration material, and influence planning of restoration treatment.

4. The conservation-restoration treatment, with consideration to all investigation findings and results, and preparations of the work area, would begin to be carried out in practice, as noted in the conservation-restoration programme.

Some had already been carried out between 1997 and 2002. At the end of 2002, the last diagnoses and certain conservation-restoration procedures were performed. The project of realisation was produced at the beginning of spring 2003, when work on the restoration scaffolding also began.

The production of a more exact time frame was anticipated after gaining appropriate opinions and initial investigation results. The focus of the first stage was the collection and or-

ganisation of data on the condition and location of different damage and its placing in the spatial grid. In collaboration with the Geodetic Institute of Slovenia in Ljubljana it was planned to mark the whole of the painting on the vault in a raster of quadrants with sides 100 x 100 cm, which could be divided into smaller units if necessary. Each point was to be precisely defined in the space of the vault and linked to the already produced photogrammetric measurements of the whole of the building, so that the wall and ceiling paintings could at any point be adequately copied by using this grid.

A system of marking photographic documentation would be developed, which would be linked to individual quadrants on the vault, making it possible at any time to find a photograph containing the wall and ceiling paintings from quadrant D22 for example, or conversely, to check which quadrant or quadrants were covered in the photograph denoted by, for example, Pc 022051.

The Restoration Centre of the Institute for the Protection of Cultural Heritage of the Republic of Slovenia was foreseen as the contractor. Foreign specialists and experts were also invited to collaborate as part of the expert group.

CHRONOLOGICAL OVERVIEW OF WORK

Preparatory work in 2002

Since conservation and restoration are in their nature investigative practices, practical work simultaneously intertwined with the processes of investigation and documentation.

For restoration work spanning over several years, a thirteen metre high scaffold – which would more suitably be called a platform or stage (contractor SCT Ljubljana) – was erected under the vault in the second half of October 2002. Sturdy anchor ties were secured into the northern and southern wall of the nave. From beneath, plaster boards were attached to the anchor ties, which prevented the visitors from seeing the work area, however, they also ensured safety against falling objects and provided noise protection. On the upper side, the platform was covered by planks and boards for walking. Tracks were attached onto this flat surface and a large, moveable tube scaffold with several levels was placed on the tracks. The fixed scaffold above the organ was adapted to the lively configuration of the organ architecture. Entry to the platform was organised through the choir, up some aluminium stairs.

On the eastern edge of the platform, by the triumphal arch, the protective wall prevented any eventual falls of objects, prevented spreading of dust towards the presbytery and transept, thus enabling restorers uninterrupted work, without disturbing church visitors. The whole work area on the platform was lit by portable neon lights with a daylight spectre, only exceptionally was additional reflector light used.⁹

The transport of material, equipment and waste material was carried out using a cargo lift.

⁹ As experience has shown, retouching in daylight or artificial daylight produces much better results than working in the yellowish light of reflectors. Neon light also emits less heat, which is very important in such a case, where rising temperature on the surface of the wall and ceiling paintings is unwished for.



Figure 11: Replacement of the worn out window frames and glazing (15 January 2004).



Figure 12: Beginning of chemical cleaning (25 February 2004).



Figure 13: First attempts at retouching with ammonium caseinate (2 April 2004).



Figure 14: Inserting tubes for injecting (2 April 2004).



Figure 15: Darkened reconstructed vault painting, which occurred with the new application of plaster in places where the old plaster had fallen off during the earthquake of 1895 (28 May 2004).



Figure 16: Video projection for visitors (4 August 2004).



Figure 17: Group photograph at the meeting of both accompanying committees (29 July 2004).

Year 2003

Restoration work on the painted vault of the Church of St Nicholas in Ljubljana was continued in 2003. In accordance with the conservation-restoration programme, the following work and treatment were carried out during the course of the whole year:

In terms of documentation, a photogrammetric image of the whole was produced, as well as a more detailed photogrammetric image of the ceiling and paintings, into which a system of temporary non-destructive marks was drawn in a raster of 100 x 100 cm.

Photographic documentation of the condition during treatment was produced in the classical analogue and newer digital techniques, with additional UV images of the retouches and overpaints. The work of restorers was also recorded using a digital video camera.

Research began on archive data, existing literature and a study of the available documentation on previous restoration treatment.

On the basis of these investigations, an art historical study about the wall and ceiling paintings on the vault began. At the same time, a documentation system with the implementation of a quadrant grid on the paintings of the vault with measurements began to take shape (contractor Geodetic Institute of Slovenia).

Measurements of the stability of the building construction using sensors continued in order to measure the micro-stretching on the cracks of the nave vault. Measurements and notes also continued on the micro-climatic conditions by using sensors to measure humidity and temperature in the space and on the surface of the wall and ceiling paintings. Measurements and their note taking continued to the end of the project. Upon the advice of professor Jože Kušar (then FAGG Ljubljana), the brick vault construction in the attic was cleaned from its top side.

As far as the wall and ceiling paintings were concerned, the areas of the giornate, overpaints and retouches were investigated and documented.

Samples of used materials were taken from the original paintings and overpaints. Scientific investigations were performed on the condition of the wall and ceiling paintings looking at damage to the paint layers, flaking of the plaster-work, efflorescences and changes in the binder pigments in the filled cracks.

Numerous reports were written about the investigations.¹⁰

Mechanical cleaning, whether using micro-suction or Wishab sponges, took much longer than anticipated in places where the colour layer did not adhere so well to the support.

¹⁰ Here cited as an exception are reports linked to research at the end of 2003. Ivo Nemeč, *Analiza odvzetih vzorcev SNL 1-116*, Ljubljana 2003. Polonca Ropret, *Poročilo o preiskavi premaza na stenskih slikah*, Ljubljana 20. 11. 2003. Polonca Ropret, *Poročilo o ugotavljanju stanja barvnih slojev*, Ljubljana 6 January 2004 (samples were taken in 2003). Polonca Ropret, *Poročilo o analitičnem spremljanju čiščenja*, Ljubljana 8 January 2004 (samples were taken in 2003).

Mechanical cleaning was not used for removing impurities in the most imperilled areas, since these had to be consolidated first with suitable preparation. Approximately 85% of the wall and ceiling paintings were cleaned using the mechanical method, whereas cleaning with chemical means was most effective using the ammonium carbonate and paper pulp method, applied over restoration rice paper.

Modifications of this procedure had been used abroad for several years, however, in Slovenia they were used to such an extent for the first time.¹¹ In using this method of cleaning, we collaborated with a team of restorers from Italy (Nevjela & Ragazzoni).¹² In our search of finding the most suitable method, we also worked with Jürgen Pursche, head restorer at the *Bayerisches Landesamt für Denkmalpflege* (Bavarian Land Bureau for the Conservation of Historic Monuments), whose advice was of valuable help.

Approximately 80% of larger and smaller cracks along the whole of the surface of the vault were filled with lime plaster (coarse and fine). The larger and deeper ones were first filled with a thick mortar with the addition of opal breccia.

We began removing the whitewash of later origin on the triumphal arch, which covered the lower, newly uncovered decorative paintings that were most probably earlier than Quaglio's paintings on the vault. The unoriginal whitewash which had been applied later was removed also from other surfaces on the curved profiles and the surfaces around the windows.

Up till the end of 2003 a precise overview of all painted surfaces and comparison with thermography results was performed, a drawing of the cross-section of the fresco paintings (with exact measurements of the thicknesses of the layers of intonaco, arriccio and masonry) was produced and also relevant formulas, materials and equipment were prepared.

We continued with fine manual cleaning of dust and dirt with Wishab sponges and removal of later overpainted additions. Visible residues of efflorescences were removed using cellulose coatings with added sepiolite. We also continued with filling smaller and larger cracks and damage, as well as applications of intonaco and arriccio.

During our work on the painted vault we received numerous individual visitors as well as smaller and larger groups on the scaffold. We presented the renovation work to everyone, which was otherwise hidden to visitors because of the erected platform in the cathedral.

¹¹ Optimal results of cleaning with ammonium carbonate were obtained above 15°C; such treatment is not recommended at lower temperatures.

¹² The first discussions about a possible collaboration began at the end of 2003.



Figure 18: Samples of pigments and binders after the artificial ageing procedure was completed (7 January 2005).



Figure 19: Retouching and reconstruction of the blind window (20 January 2005).



Figure 20: Tubes after injecting was completed (25 May 2005).

Year 2004

In February we were joined by the restorers from the Nevyjel & Ragazzoni studios and together we proceeded with cleaning using ammonium carbonate coatings. During the first stage (until mid-July) surfaces in the range of 15 fields in length (26 in all) were cleaned and prepared for continued treatment, with the remaining 11 being done by the end of 2004. Alongside cleaning, the weakened plaster layer (intonaco) was consolidated, with the big and small cracks being filled, and unsuitable plasterwork removed. Experimental retouches with ammonium caseinate as a binder, which is frequently used by Italian restorers, were also performed. All later unsuitable whitewashes were removed from the window profiles and triumphal arch. Damaged areas were filled, and missing parts were modelled in and covered with a thin layer of lime levelling mass.

More recent whitewashes were removed from the cornice on the level of the scaffold, in as much as they could be reached given the height of the platform. More significant damage on the cornice was repaired (overbuilt) and the old reflectors and cables were removed.

All the later whitewashes were removed, which covered the lower decorative paintings on the wall of the triumphal arch. Even though the art historical profession could not unite on the date of origin, and hence the presentation of the discovered fragments (possible whitewashes), retouching and reconstruction were foreseen in this area, which somewhat increased the amount of anticipated work.

Year 2004 was demanding, particularly from the painting-restoring viewpoint, since we were working on numerous technical problems (choice of binder, selection of highest quality materials, aesthetic questions relating to missing or heavily damaged parts, even treatment and results on variously damaged surfaces) and the organisation of work on such a quality monument.

In the second half of December most of the surfaces awaiting retouching were prepared by having had the damage filled.

Restoration work on the western wall above the cornice, along with both paintings and profile work was executed by restorer Darko Tratar with colleagues.

In 2004 (up to mid-December) he completed work on the stucco elements and consolidated, cleaned and filled the paintings on the western wall. He completed the retouching and reconstruction of the heavily damaged western wall, which had suffered from the 1895 earthquake, in 2005.

We should especially highlight that the collaboration with Italian restorers began in this year, from whom the method

of cleaning used in the neighbouring country since the 1970s was brought to Slovenia. From now on, this method will form part of the standard repertoire of treatment used by every restorer of wall paintings in Slovenia.

The course of restoration work was documented all along by photographs and videos, resulting in much material which will need to be organised and appropriately presented after treatment. Throughout the years the treatment gained much positive attention, be it on numerous TV shows, or by the numbers of individual and group visits on the scaffold. We prepared some public presentations, such as the lecture with presentation of the conservation-restoration treatment performed on Quaglio's wall and ceiling paintings at ZRC SAZU in Ljubljana.¹³

During treatment, several technical-expert reports were produced for both committees that monitored our work.

In order to select the most suitable binder, pigments with different binders were applied to a layer of lime plaster. Samples prepared in such a way were then submitted for artificial ageing, which was to simulate a period of ten years by means of a rapid exchange of high and low temperatures.

Year 2005

At the beginning of 2005 we received the results from the artificial ageing of the binders. Based on results,¹⁴ the binder Tylose MN 300 was chosen, which is water soluble, totally removable and is one of the binders used in the production of wall paints. The paints mixed with this binder have a similar appearance and properties to watercolours. Before using the binder, we added a very small percentage of fungicidal agent.¹⁵

We continued work with modelling in the profiles and finishing the window sills. Retouching and reconstruction of both blind windows were nearing their final stage. We attempted to experimentally clean the surface of the frescoes also with a steam cleaner, however, unsuccessfully. In the attic, we thoroughly examined the northwest corner with the removal of piled up material up to the vault's brick construction. It was discovered that the construction of the

lower part of the vault began with larger stone boulders as opposed to bricks, probably due to greater anticipated pressure in this area. Tubes for injecting into the cracks were inserted in the area above the organ, which served as an indicator to see when the crack was full of the injected material as it was being poured from the upper, attic side of the vault.

In November 2005 some new portable wireless temperature and humidity sensors were implemented. The year 2005 could be called "the year of the retouch", since after completing cleaning in 2004, the whole year was spent intensely retouching thousands of tiny, and also some larger damaged areas, including the reconstruction of the virtue's head on quadrants H8 and H9.

Year 2006

In 2006 work that had begun in 2005 continued and was completed. Work mainly concentrated on retouching the wall and ceiling paintings across the whole of the vault, the reconstruction and finalisation of the profiles and marbled fields in the region between the windows and the main cornice, as well as sorting out the profiles and carrying out the reconstructions and renovations of the whitewashes on the triumphal arch wall. After the Florentine cleaning method¹⁶ of the whole vault was complete, the colour spectrum expanded and became more varied. Tonal values also expanded to include distinctive lights and darks. As the unoriginal layers were removed, numerous damaged parts became more visible due to the changes in the structure of the support (cracking, flaking or lifting of the colour layers and plasterwork) that had taken place over the many years, or due to inappropriate restoration treatment performed previously (overpaints, greyish discolouration of lighter surfaces). At the end of June and beginning of July the heavily damaged fields and profiles of the medallions by the organ construction were renovated and also gilded. The meeting of the international committee on 22 May 2006, which confirmed the successful realization of the conservation-restoration project, marked the end of the work on the vault at the height of the platform. The rest of the work was officially completed by a team of restorers from the Restoration Centre (some had worked on the project throughout the four years) on 30 June 2006. A small part of the team also continued work on restoring the damage that had occurred with securing the anchor ties of the platform into the north



Figure 21: Installation of new stained glass (7 September 2005).



Figure 22: We can imagine the appearance and structure of the original windows from the two paintings of the blind windows (7 September 2005).



Figure 23: Dismantling of the organ sculptural decoration (27 February 2006).

¹³ ZOUBEK 2004. Rado Zoubek, Konservatorsko-restavratski posegi na Quaglijevih freskah v stolnici sv. Nikolaja v Ljubljani, lecture at the ZNANUM symposium, Ljubljana, 16 and 17 February 2005. Polonca Ropret, Kemijsko čiščenje in izbira veziva za retušo – stolna cerkev sv. Nikolaja v Ljubljani, lecture at the ZNANUM symposium, 16 and 17 February 2005.

¹⁴ ROPRET, ZOUBEK, SEVER ŠKAPIN, BUKOVEC 2007, pp. 1148–1159.

¹⁵ Cf. paper by Rado Zoubek, *The use of chemical analyses results in retouching*.

¹⁶ Cf. paper by Rado Zoubek, *The conservation-restoration project and Quaglio's painting process*.



Figure 24: Relevant committees view the last stage of restoration work (22 May 2006).

and south walls of the church. In the first days of June, the dismantling of the scaffolding began and then gradually all the scaffolds on the platform, under the constant supervision of the project leader. The construction of a temporary supporting scaffold was begun from the underside (in the nave). The successfully completed project was for the first time presented to numerous invited guests and the media on the work platform, 13 metres high (the renovated wall and ceiling paintings of the vault and the western wall were presented publicly for the first time – without the disturbance of the scaffolds) at a press release on 22 May 2006. In the days that followed, workers began removing the platform and erecting a temporary scaffold approximately three metres lower down. The strong lower scaffold was required for the uninterrupted dismantling of the heavy anchor ties secured into the walls of the nave. After the anchor ties were removed, the holes in the walls were filled and corrected with plain extended mortar. All superfluous whitewashes down to the wide cornice were then removed by the restorers, the missing profiles on the frames were modelled in, small and large damaged parts were filled, the surfaces were painted with a suitable lime coating, the frames were coated with

mixture and gilded. After the completion of the interior, the damaged fields of the medallions were adjusted in terms of tone and colour to suit the surroundings and the painting was reconstructed. The project was complete in terms of restoration on 5 September 2006.¹⁷

¹⁷ All published photographs are the property of the IPCHS Restoration Centre.

General data:

PLACE/LOCATION: Ljubljana, Dolničarjeva 1
HERITAGE REGISTER NO. (EŠD):

Cerkev sv. Nikolaja 333

SITE: Cathedral of St Nicholas

ARTIST/DATE: the painter Giulio Quaglio (1668–1751), 1705–1706

OBJECT (DESCRIPTION): paintings on the nave vault and western wall, decorative surfaces and profiles

TECHNIQUE/MATERIAL: *fresco buono*, with later additions in the *secco* technique

MEASUREMENTS: nave vault: 520 m², western wall: 52 m²

OWNERSHIP: Roman Catholic Church

MANAGEMENT: Parish Office of St Nicholas, Ljubljana

INVESTOR: Ministry of Culture of the Republic of Slovenia; the Parish Office of St Nicholas, Ljubljana; City Council of the City of Ljubljana

COMMISSIONED BY: Ministry of Culture of the Republic of Slovenia; the Parish Office of St Nicholas, Ljubljana; City Council of the City of Ljubljana

SPECIALIST ORGANISATION IN CHARGE:

IPCHS, Ljubljana Regional Office

CONSERVATOR IN CHARGE: Dr. Uroš Lubej, cons. coun., IPCHS, Ljubljana Regional Office

WORK CARRIED OUT BY:

IPCHS Restoration Centre

HEAD OF RESTORATION CENTRE:

Jernej Hudolin, cons.-rest adv.

PROJECT LEADER: Mag. Rado Zoubek, cons.-rest coun., IPCHS Restoration Centre

EXPERT SUPERVISION: expert committees

- **Advisory Committee:** Prof. Mag. Ivan Bogovčič, Department of Restoration, Academy of Fine Arts and Design, University of Ljubljana; Prof. Dr. Jože Kušar, Faculty of Architecture, University of Ljubljana; Silvester Gaberšček, State Undersecretary, Ministry of Culture of the Republic of Slovenia; Dr. Ferdinand Šerbelj, National Gallery of Slovenia; Msgr. Dr. Franc Šuštar, Theological Seminary, Ljubljana, Msgr. Peter Zakrajšek, Archdiocesan Economic Management, Ljubljana Archdiocese
- **Expert Committee:** Prof. Giuseppe Bergamini, Director of the Museo Diocesano e Gallerie del Tiepolo di Udine; Prof. Miljenko Domijan, Chief Conservator for Immovable Heritage, Directorate for Cultural Heritage Protection, Ministry of Culture of the Republic of Croatia; Dr. Josip Korošec, Institute for the Protection of Cultural Heritage of Slovenia, Restoration Centre, Ljubljana;



Figure 25: Finishing touches after removal of restoration scaffolding (31 August 2006).



Figure 26: The official end of the conservation-restoration project (10 November 2006).

Dr. Michael Kühnenthal, Bavarian Land Bureau for the Conservation of Historic Monuments, Munich; Academician Prof. Dr. Vladimir Marković, Faculty of Philosophy, University of Zagreb; Jürgen Pursche, Chief Restorer on Bavarian Land Bureau for the Conservation of Historic Monuments; Dr. Marijan Smolik, Ljubljana Archdiocese

INDIVIDUALS INVOLVED IN THE PROJECT:

Simon Arnšek, cons.-rest.; Uroš Arnšek, cons.-rest.; Valentin Benedik, cons.-rest adviser; Marta Bensa, cons.-rest.; Barbara Blaznik; Katra Blaži, cons.-rest.; Marjana Brozovič; Mojca Čermelj, cons.-rest.; Mag. Nuška Dolenc Kambič, senior cons.-rest.; Saša Dolinšek, cons.-rest.; Peter Draksler; Matej Drobež; Sonja Fister, cons.-rest contractor; Mag. Jelka Glas, cons.-rest.; Maša Gostinčar; Špela Govže, cons.-rest.; Živa Grašek; Jernej Jerman; Maja Kastelic; Nina Kamnikar; Katja Kavkler, cons.-rest.; Polona Kovačič; Noemi Krese; Karmen Križančič; Maja Lešnik; Mojca Marc; Tihana Mioč; Mojca Nečimer; Ivo Nemec, cons.-rest coun.; Ursula Osojnik; Suzana Paškulin; Miha Perne; Igor Peršolja, senior cons.-rest.; Tjaša Pristov, cons.-rest.; Andreja Ravnikar; Mitja Ravnikar; Dr. Polonca Ropret, senior cons.-rest.; Mitja Rus; Nuša Saje, cons.-rest.; Marjeta Sitar; Mateja Neža Sitar, cons.; Katja Štukelj; Samo Tavželj; Mag. Nikolaj Vogel; Sabina Vrečko; Lea Vrečko; Uroš Weinberger; Matej Zupančič, senior cons.-rest.; Mateja Zorman; Gregor Zoubek; Jure Zoubek; Mag. Rado Zoubek, cons.-rest coun.

EXTERNAL PARTICIPATING INSTITUTIONS AND COMPANIES:

ALUO – Academy of Fine Arts and Design, Ljubljana; Darko Tratar – restorer, Dol pri Ljubljani; FA – Faculty of Architecture, Ljubljana; FKKT – Faculty of Chemistry and Chemical Technology, Ljubljana; GIS – Geodetic Institute of Slovenia, Ljubljana; IJS – Jožef Stefan Institute, Ljubljana; Ključavničarstvo Mehle, Grosuplje; NEVYJEL & RAGAZZONI, Restauro d'opere d'arte, Trieste; RÖFIX, d. o. o., Grosuplje; SAMSON KAMNIK, d. o. o., Kamnik; SCT d. d., Department for building construction, Ljubljana; SER.CO.TEC., Trieste; Tecno futur service, Modena; ZAG – Slovenian National Building and Civil Engineering Institute, Ljubljana; ZRC SAZU – Research Centre of the Slovenian Academy of Sciences and Arts, Ljubljana; ZRMK – Institute for the Research of Material and construction

Research, analysis and application of results in the restoration

The history of the restorations of wall paintings

Mateja Neža Sitar

Investigations of colour layers

Polonca Ropret

Report on the initial cleaning and consolidation procedures

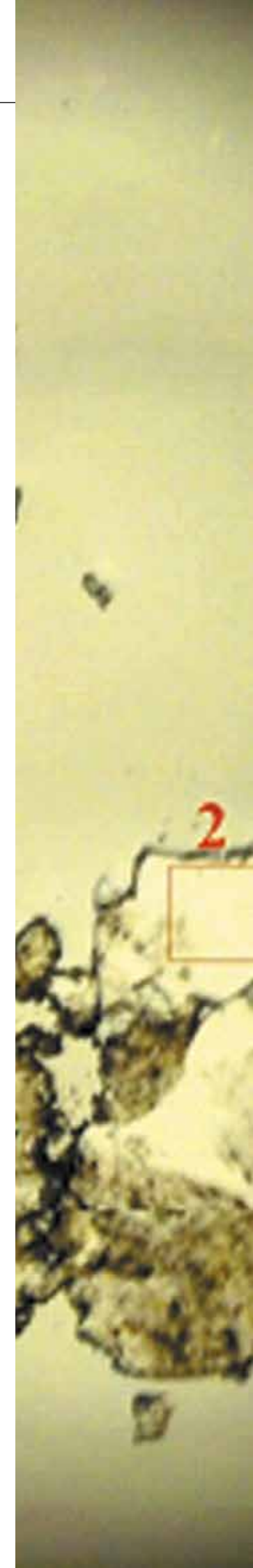
Marta Bensa

Final report on the cleaning

Giovanna Nevyjel, Claudia Ragazzoni

The use of chemical analyses results in retouching

Rado Zoubek



The history of the restorations of wall paintings*

Mateja Neža Sitar

KEY WORDS:

Ljubljana, Cathedral of St Nicholas, Baroque, Giulio Quaglio, wall and ceiling paintings, restoration, restorer, conservator-restorer, conservation-restoration treatment, conservator, historical monument protection service

ABSTRACT

The wall and ceiling paintings by the Lombardian master Giulio Quaglio in Ljubljana Cathedral have experienced numerous restorations, three of the largest of which are widely known and have been officially documented with varying degrees of detail: by Matevž Langus between 1846 and 1853, by Anton Jebačič between 1905 and 1906 and by Peter Železnik between 1944 and 1947. The unofficial, until now unknown restoration Železnik carried out between 1959 and 1961 can either be considered the fourth major treatment (and the third restoration of the nave vault) or the third one as it was, in fact, a continuation of the general restoration that began in 1944 and was confirmed only through the discovery of some new private documentation. We must also mention numerous smaller restorations carried out by various restorers (decorative painters, artistic painters, restorers, etc.) independently or within the framework of the protection of historical cultural monuments in the 20th and 21st century. The last, fifth restoration, within the scope of which this research took place, was carried out under the management of the Restoration Centre of the Institute for the Protection of Cultural Heritage of Slovenia (IPCHS). Using interesting photographic and written material, which is in some cases being published for the first time, this study will describe the changing appearance of the wall and ceiling paintings, which today show not only the merciless signs of the passage of time but also the results of various, sometimes very unsuitable restorations. More detailed knowledge about the older restorative treatments could be of great significance to further, more suitable restoration and conservation treatments for the benefit of future generations.

* This is a slightly adapted version of a chapter on historical research from the PhD thesis *Spomeniškovarstvena problematika restavriranja Quaglieve poslikave na oboku ljubljanske stolnice* (Heritage Protection Issues Regarding the Restoration of Quaglio's Wall Paintings on the Vault of Ljubljana Cathedral, Faculty of Philosophy, University of Ljubljana, typescript in preparation).

INTRODUCTION

In addition to the restoration¹ process during the last restoration of the paintings on the nave vault and on the western wall of Ljubljana Cathedral (carried out by the Restoration Centre of the IPCHS, 2002–2006), the paintings were researched from the viewpoint of the history of art and the conservation profession. The subject of our research was primarily the study of previous treatments on Quaglio's paintings, in particular those on the nave vault and the western wall. The objective was to be able to assist restorers in deciding on how to execute the restoration treatments in the most suitable manner. Our intention was to throw light on the time, background and consequences of restorations and to follow and research in detail any restoration treatments on the paintings, as far as this was possible on the basis of information from preserved documentation, other sources and literature. As well as researching traditional sources, we also employed some unestablished methods specific to the conservation profession. Whilst evaluating our subject from the viewpoint of the history of art and conservation we had to consider the wider cultural and historical, as well as social, political and economic background. For this purpose, due to incomplete data and in some cases badly preserved documentation, we had to use various working methods and examine many different sources (written, photographic, graphic, literary, newspaper, video and oral) from the preserved documentation held in public and private collections and archives: written dossiers; technical plans of restorations, including measurements, sketches and drawings; photographs; collections of various expert materials and libraries. Let us emphasise that the main characteristic of conservation and art history research is a strong dependence on pictorial material as this often resolves the complex and problematic situations conservators and restorers come across in their practical work (e.g. reconstructions). We were interested in information about the type of treatments,

¹ The expression "restoration / renovation" is somewhat problematic; it is used in generalised and simplified meaning. It denotes any treatments on the wall paintings through the different periods, carried out, by and large, with the goal of preserving and protecting them. The current more suitable term is "conservation-restoration treatment", but it cannot be used to appropriately describe past restorative treatments.



Figure 1: A study of the history of treatments, including an overview of the old documents in the room above the cathedral sacristy.

the materials used, when a particular restoration took place, who commissioned it, who carried it out and how. A special feature of this type of research is that it involves not merely the collection of data and notes, but also the drawing of logical connections and understanding, verification and comparison, i.e. the correct use of the information in practice for the good of the historical monument. Research took place directly on the scaffolding, in close cooperation with restorers in an applied manner. Acquired data that is correctly interpreted can throw light on problems regarding the current condition of a work of art, in our case Quaglio's wall and ceiling paintings; it can also help in establishing the reasons for specific damage and in defining the consequences of individual restoration treatments on the painted surfaces. Knowledge of the structure of a wall painting and the difference between the original painting and subsequent over-painting treatments, additions to the paintings (retouches) and other changes on the colour layer brought about in different ways, is of fundamental significance when studying Quaglio's painting technique.

We will look at individual restoration treatments by time periods and then in relation to specific problems. Finally, we will present the conclusions of our research and compare them to those arrived at during the last restoration whilst examining *in situ* the condition of the colour layer on Quaglio's paintings below the nave vault and briefly comparing the painter's other work from the same time in our geographical vicinity.

RESEARCH INTO RESTORATION TREATMENTS ON QUAGLIO'S WALL PAINTINGS

Through the history of Ljubljana Cathedral, for different reasons such as changing artistic tastes, the damage caused by earthquakes, air pollution, damp, temperature variations, age, dirt and other factors, a number of restorations have taken place, in which methods with a varying degree of suitability were used. These restorations crucially changed the character of the building itself and of Quaglio's paintings. Research into the restoration treatments carried out on the paintings – be it



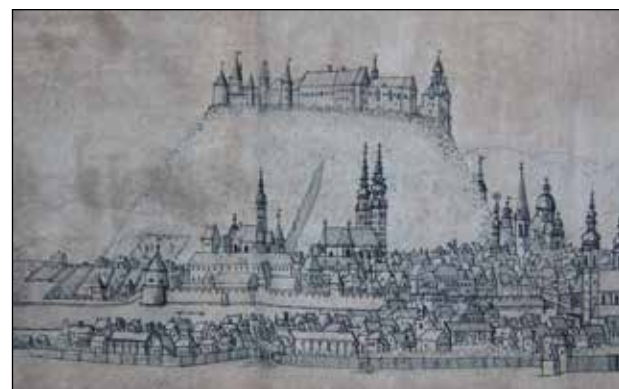
Figure 4a: The first large restoration of the cathedral paintings was carried out by Matevž Langus.

only cleaning², the replacing of the worn-out fillers in cracks and old fillings, or actual retouching, reconstruction, painting or toning undecorated sections of the wall, in short, a whole range of conservation-restoration treatments (as we describe these procedures today) – enables us to learn about the character of the painting itself and to find the correct, appropriate and most effective approach to the restoration, protection and conservation of Quaglio's work for the future.

We will begin our study of the history of all the known treatments on the cathedral's wall paintings with the earliest and most crucial construction treatment into the very structure of the Baroque building. It was because of the building of a real dome that Quaglio's illusionistic dome was destroyed. The other wall paintings, according to the data available from existing sources and literature, experienced three major restorations. In addition to these more extensive treatments there were a number of smaller restorations that are documented to a varying degree and others that included mainly building repair of the exterior and the interior.³

² Professor Mag. Ivan Bogovič notes that a professionally more appropriate description would be "the removal of dirt", but as we are in this study using primarily quotes from older documents, we have kept the expression "cleaning".

³ The subject of this study are wall and ceiling paintings and therefore other information regarding the restoration of sculptures, oil paintings, altars, the organ and other cathedral fittings, as well as any building, stonemasonry, carpentry, tinsmithing, goldsmithing and other work are not discussed here in detail, with only a few exceptions that needed to be studied in relation to the project at hand (the problem relating to the original colour of the architectural elements, the main wall garland and the stucco work).



a



b



c



d



e

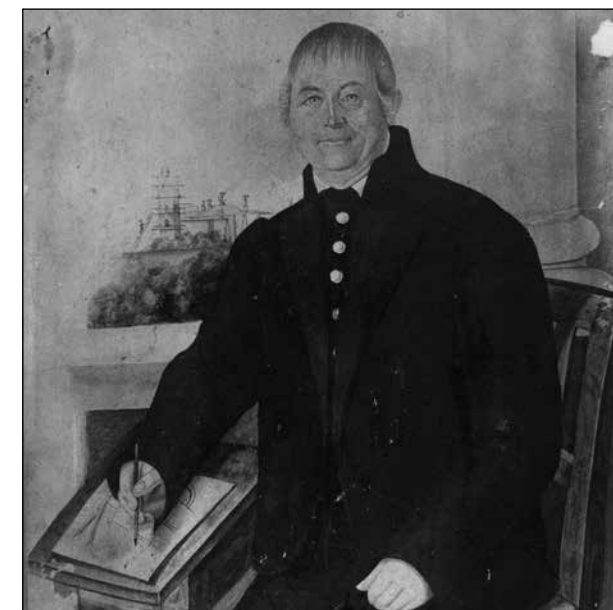
Figures 2a–2e: The changing exterior of the Baroque cathedral. **2a:** The cathedral without a dome in 1732 in a detail from a drawing of Ljubljana by Friedrich Bernhard Werner. **2b:** The cathedral with the dome and the original western gable on Kristijan Pajer's photograph from before 1891. **2c:** The cathedral with a new western section after the 1895 earthquake. **2d:** The cathedral during one of the renovations in a detail from a postcard before 1901. **2e:** The present-day cathedral, with the reconstructed Baroque gable (in 1989) on the western side.



b



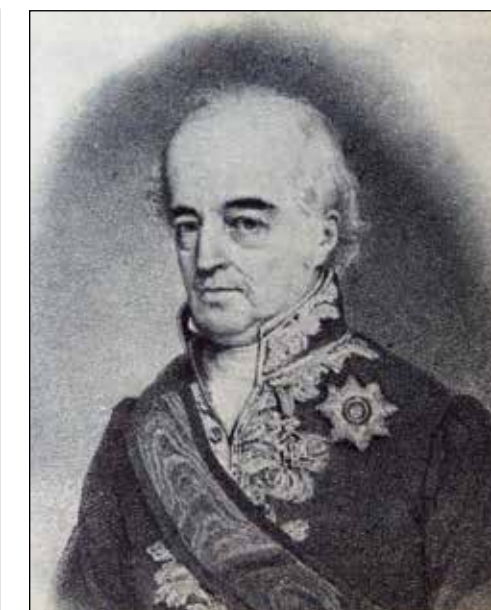
c



a



d



e

Figure 3a: After the construction of a real dome by Matej Medved, Quaglio's painted dome was destroyed.

Figures 3b, 3c, 3d, 3e: Only three fragments remained: *Emona*: **3b**, *Carniola*: **3c** and a section depicting the crowning of Mary: **3d**, (photographed in 1963 prior to the restoration), which was kept by Baron Jožef Kalasanc Erberg: **3e**.

THE RESTORATION BY MATEVŽ LANGUS (1846–1853)

In the 19th century, a number of restorations and alterations took place during the time of the Bishop Anton Alojzij Wolf and the priests Karl Zorn and Jožef Zupan. It started with the construction of a dome on a high drum, the marbling of internal walls, the extensive gilding of the architectural elements and ornaments and other restoration work on the interior and exterior of the cathedral.⁴

We will focus on some key data connected with Quaglio's wall paintings. In 1841, a proper Roman dome was erected above the intersection of the nave and the transept, thus realising a wish of the cathedral's former Dean Janez Anton Dolničar. The builder Matej Medved (figure 3a), with the help of the carpenter Jurij Pajk, began to build a high dome that contributed greatly to the appearance of Ljubljana (figures 2a, 2b, 2c, 2d, 2e). The construction, from all the preparations for this demanding project in terms of both building and financing, to the choice of the most suitable plan and builder, has been extensively researched and written about, first by Viktor Steska in 1939 and then by Ana Lavrič in 1997.⁵ Steska described the illusionistic dome as: "[...] a fake shallow dome with a wooden ceiling, which hung from the roofing attached with metal bindings."⁶ The wooden, plastered and painted ceiling of the fake dome is thought to have been repaired in 1829 by the master mason Francesco Coconi, but subsequently due to fire risk and in order to provide more light, fresh air and for other reasons, they began thinking about building a real dome.⁷ Thus in 1841, when the old fake dome was demolished and a real one built, Quaglio's illusionistic painting (the scene of *Mary's Crowning and the Glorification of St Nicholas*) from 1703⁸ was destroyed. Steska writes that a few fragments were

preserved (he mentions two, *Emona* and *Carniola*) and that they were removed and taken care of by **Matevž Langus** (1792–1855) (figure 4a) and the custodian of the provincial museum Henrik Freyer.⁹ Two fragments that encompass the upper section of *Emona* (160 x 137 cm) and *Carniola* (129 x 156 cm) were afterwards kept by the Ljubljana *Rudolfinum*¹⁰ (figures 3b, 3c), whilst two other fragments, following a treatment by Freyer, were kept by Baron Jožef Kalasanc Erberg (figure 3e). Lavrič published important information from Erberg's correspondence relating to the fate of the destroyed dome painting. Erberg did not agree with the building of a new dome and the destruction of Quaglio's painting which could, in his opinion, have had a long life. He also doubted the abilities of any artist to be able to paint in Quaglio's manner and proposed that the new cupola should remain free of wall paintings. He chose for himself the most beautiful section of the removed illusionistic painting depicting the crowned Mary (222 x 128 cm; figure 3d) and had it inserted above the door of the staircase in his mansion in Dol near Ljubljana, whilst he added the other fragment to his art collection. He is said to have later regretted that he, together with other art lovers, had not saved more fragments. The frescoes were restored for him by a courtier of the Saxon king, who at that time happened to be visiting the area.¹¹ Lavrič wrote that during the building of the dome various other repair work was done, including the restoration of the entire tiled and tin roofing and even the cleaning of the frescoes in the interior, but we could not find any more detailed information on this.¹² Before Quaglio's dome painting was destroyed, Matevž Langus painted a minia-

⁹ STESKA 1903, p. 528. Cankar mentions the destroyed fresco in the dome, from which only "two inconsequential segments" remain: CANKAR 1920, p. 244; cf. STESKA 1939, pr. 162, LAVRIČ 1996 a, p. 27.

¹⁰ *Illyrisches Blatt*, 1841, (points 87 and 65) no. 20, p. 96; cf. CANKAR 1920, pp. 243–244; now, the fragments belong to the National Museum of Slovenia in Ljubljana; cf. BERGAMINI 1994, pp. 182–183 and 185; CEVC 1996, p. 25; LAVRIČ 1997, p. 37.

¹¹ LAVRIČ 1997, p. 37, noting the sources and literature (two letters by J. K. Erberg to his son Jožef Ferdinand, dated 24 June 1840 and 18 August 1841). The Dol fresco with Mary from the *Crowning* section was in 1962 given by Dr. J. Pogačnik, to the National Gallery of Slovenia, where it is still kept, whilst the fate of the other fragment is not known. I wish to thank the restorer Professor Franc Kokalj for the information relating to the Dol fresco that the restorer Emil Pohl from the then Republic Institute removed the fresco from the inner staircase of the Dol mansion and mounted it onto a new support (the fresco is thought to have been removed from the staircase around 1958).

¹² Only a bill for the painting and cleaning of frescoes: LAVRIČ 1997, pp. 36–37 including all the given sources.

⁴ LAVRIČ 1997, pp. 32–52 and LAVRIČ 1996 a, pp. 26–38. The restoration was researched in detail by Dr. Ana Lavrič, to whom I wish to thank for her exceptional support, precious information and expert guidance in my research.

⁵ STESKA 1939, pp. 158–164 and LAVRIČ 1997, pp. 32–52, plans and the mention of older sources. The whole building process was described in the daily press: e.g. *Carniola*, *Illyrisches Blatt* between 1841 and 1844.

⁶ STESKA 1903, p. 488. At the intersection of the transept and the nave, a wooden dome was erected in line with the plans by Andrea Pozzo which, however, did not really suit the building as it had no windows and the middle of the church was therefore very dark: *Zgodnja Danica* 1900, pp. 275, 414.

⁷ LAVRIČ 1997, pp. 32–33 and p. 37, noting the sources.

⁸ About the appearance and description of the wall painting: DOLNIČAR 2003, p. 296 and 323; taken from *Historia* p. 127 and p. 161.



Figure 4b: In 1841 Langus painted a considerably reduced copy of Quaglio's dome painting; top photo: Janez Kotar before 1904, bottom a photo of the original after the restoration in 2007. **Figure 4c:** Between 1843 and 1844 Langus painted the interior of the real dome; top, the condition in 1976, bottom, the condition in 2002.

ture copy of it (figure 4b),¹³ and then, after the new dome was built, overpainted the evangelists on the pendentives,¹⁴ which were damaged due to the erection of the scaffolding; he also painted the lantern at the top of the dome (*The Holy*

Spirit and Angels) and in the end also the dome walls (*Mary's Crowning and the Glorification of St Nicholas with Angels and Saints*) between 1843 and 1844 (figure 4c).¹⁵ After completing the dome paintings, Langus was in 1846 entrusted by

¹³ LAVRIČ 1997, p. 37. The copy (oil on canvass, 102 x 90 cm) is kept by the Ljubljana Ursuline monastery: VEIDER 1944, p. 120, no. 83, fig. 3.

¹⁴ More on the character of the overpainted evangelists: BERGAMINI 1994, p. 182; Lavrič says that Quaglio's painting still shows through the overpainting (compared to Langus's oil copies): LAVRIČ 1996 b, p. 27.

¹⁵ He was told: "[...]keep to Quaglio's paintings as much as possible when painting", says STESKA 1903, p. 528 taken from *Illyrisches Blatt*, 1841, no. 20, p. 96 and p. 170. The description of Langus's painting: SMOLE 1982; STESKA 1939, pp. 162–163; LAVRIČ 2007, pp. 60–65; a more detailed analysis of the painting: LAVRIČ 1996 a, p. 27.

the Church authorities with the next task – the restoration of Quaglio's wall paintings.¹⁶ The information about Langus's restorations came from the research carried out by Ana Lavrič, particularly of Jožef Zupan's manuscript *Pro memoria* (1855–1863) and Franz Kurz zum Thurn und Goldenstein's critical letter (1859). He restored all the wall paintings, but with regard to the ceiling paintings, only those in the chapels. He began his work next to the altars in the transept (where he added quite substantial additions), continued on the two scenes above the main altar, in 1847 restored the four apostles, two paintings above each of the sacristies, the allegories of the four cardinal virtues, four coats of arms below the dome and four legends of St Nicholas in the presbytery. In 1851 he continued with the restoration of the chapels of St George, the Saviour of the World and St Magdalene, and in 1853 of the other three chapels.¹⁷

Langus died in 1855 and in the same year the newly appointed priest Jožef Zupan continued the major restoration project started by Zorn. He described the restoration and gave an overview of all the work in great detail in his manuscript *Pro memoria*.¹⁸ He began in 1859¹⁹ with the marbling of walls and pilasters²⁰ and continued with the gilding of the interior. At the end of the restoration work in 1860, the borders of the marbled surfaces above the cornice and the originally grey ornament in the freeze under the garland cornice were also gilded,²¹ which is particularly interesting as there is a great probability that the ochre yellow decorative painting of the triumphal arch wall imitates the gilded stucco work. During this

time the organ was also renovated by the craftsman Ferdinand Malahovski.²² The multiple restorations of the organ probably caused damage to the painting on the western wall. The extensive restorations during the 19th century²³, performed as an introduction to the preparations for the celebration of the four hundredth anniversary of the Ljubljana Diocese, thoroughly altered the character of the church's interior.²⁴ The new appearance of the Cathedral received both an enthusiastic response and criticism. From the critical comments in the very negative letter written by Franz Kurz zum Thurn und Goldenstein (1807-1878)²⁵ to the Church administration about the marbling, gilding and other work we have learnt that during this extensive restoration the paintings on the nave vault were also cleaned. Izidor Cankar in his doctoral dissertation wrote that Quaglio's paintings had not always been "treated very gently"²⁶ and published a part of Goldenstein's letter. Lavrič in 1996²⁷ translated and published in its entirety the protest letter to the Ljubljana Chapter Consistory, dated 7 September 1859, in which the author listed thirteen points criticising the "barbarity committed". We will single out the information that refers to Quaglio's paintings. Under point two, he stated that Quaglio's four evangelists on pendentives were unnecessarily destroyed and substituted by "unfaithful copies", whilst under point three, he wrote: "Artistic destruction was also committed during the cleaning of the large fresco in the nave. The work was done by servants using scrubbing cloths in such a barbarian manner that the artistic finesses of the great master Quaglio were lost for ever, in particular the treatment of the background and perspective architecture, the aureole and the blue sky. Because of considerable retouching, which was carried out very skilfully and lavishly, the old painting before it was cleaned had a much more

¹⁶ LAVRIČ 1996 a, p. 28.

¹⁷ LAVRIČ 1996 a, pp. 28–29.

¹⁸ ZUPAN 1855–1863. I wish to thank Dr. Marjan Smolik and Msgr. Peter Zakrajšek.

¹⁹ The restoration is mentioned by: AŽMAN 1889, pp. 169–217; CANKAR 1920, pp. 244–245; ŽELEZNIK 1948, *Poročilo*; ROZMAN 1963, p. 126 (who even then correctly described the consequences of the restorations in the 19th century: the west gable, the gilding and marbling on the inside pilasters, the gilding of the capitals, etc.); BERGAMINI 1994, p. 183 (mentions the restoration in 1859, but it could not have been done by Langus because he died in 1855); LAVRIČ 1996 a, pp. 26–38; LAVRIČ 2003 a, p. 60, fn. 308; LAVRIČ 2007, pp. 20–26.

²⁰ The marbling was carried out by Nicola Torazzo from Como, who lived in Trieste; the pilasters were coated with artificial red marble (red *marmorin*, a substitute for stucco lustrato), was during the restoration in 2002 also found during the probing of the two pilasters next to the large window in the western wall), the flat walls between them with white Carrara marble (stucco): LAVRIČ 1996 a, p. 31.

²¹ LAVRIČ 1996 a, p. 31. ŽELEZNIK 1948, *Poročilo* – he describes the badly carried out gilding eighty years earlier; cf. LAVRIČ 1996 a, p. 31 with fn. 46.

²² Cf. ŠKULJ 1989, pp. 79–80, SMOLE 1982.

²³ Between 1859 and 1863 the cathedral was completely renovated and newly furnished: LAVRIČ 1996 a, p. 33.

²⁴ LAVRIČ 1996 a, p. 32.

²⁵ In two articles (STELE 1965, pp. 47–52, and MOLE 1965, pp. 53–59) we can learn about the unsuccessful restoration treatment by Goldenstein in 1840 in St Primus's church above Kamnik. The painter from Salzburg, who was between 1834 and 1867 living in Ljubljana, alongside Langus, was at that time the most active painter in Slovenia. His bad reputation earned him the title of "the master of botchery", he did not do any better with his other restorations (STESKA 1927, p. 51.); cf. LAVRIČ 1996 a, pp. 37–38. In addition, he has been accused of painting too fast "to the detriment of true art": STESKA 1908, p. 77. Thus, Goldenstein's criticism was probably, in addition to "his heritage protection zeal also brought on by his personal disappointments" because he was not commissioned for the restoration of the cathedral: LAVRIČ 1996 a, p. 37.

²⁶ CANKAR 1920, pp. 244–245 in fn. 8.

²⁷ LAVRIČ 1996 a, pp. 34–37.



Figure 5a: The earliest shots of the cathedral's interior were taken by Kotar (published in: STESKA 1903). A photograph of the interior looking eastwards (the undecorated arch wall is visible) with the date 1898 on the back, when Kotar created a series of new postcards depicting Ljubljana buildings, especially churches (see: *Slovenski narod*, 1898, p. 3).



Figures 5b, 5c, 5d: It is possible that Kotar's photographs of Quaglio's depictions of Nicholas's miracles in the presbytery (published in: STESKA 1903), are from the same 1898 series.



Figure 6a: The second “restorer” Anton Jebačič.

subdued appearance than it does in its present bright, washed out condition. For an only slightly higher price this work of art could have been restored well, if only the church's administration had taken wise steps before the murderous hands managed to destroy the nuances of light and shade of the retouched sections. In addition, where the mortar touched the paintings some areas are now completely washed out; moreover, the restoration of the chapels was done with too much haste for Langus to be able to carry the work out professionally.²⁸ Under point nine he criticised the marbling and gilding, saying: “Here, too, all the retouching has been washed out, all the lighter accentuation in yellow, royal blue and malachite was completely damaged, only ochres suffered less extensive damage except in the lightest parts of the flesh, where there was also a great deal of destruction. The style and procedures of a great master must be studied, and simple artisans and parish clerks should not feel called to do this, as should not men in high positions lacking any expert education.”²⁹ Under point nine he mentions that the arches do not rest directly on the cornice, but on a wall strip with marble inserts: “These in-between walls that link the paintings with the cornice were whitened with lime, as was the whole of the garland, together with the dome supports.” Here he is also appalled by the contrast of this whiteness with the red marmorin, adding: “At the top there is the washed-out fresco with a rich, clumsy, golden border, then lime, applied very copiously, unevenly and carelessly so that in some places it reaches into the painting itself [...]. What was needed was to follow the

²⁸ LAVRIČ 1996 a, pp. 34–35.

²⁹ LAVRIČ 1996 a, p. 35.

manner indicated by Quaglio, taking into account the colour shades of the architectural elements, which was partly continued by Langus in the dome.”³⁰

With regard to the original colour of the undecorated architectural elements let us mention an explanation from the report by the renovator Peter Železnik from 1948: “In the toning of the strongly emphasised and decorative architectural elements that adorn the cathedral and frame Quaglio's frescoes, the original tone, which is certain to have been provided by the fresco painter and architect Quaglio, should have been taken into account as much as the gilding and the later marbling allowed.” He goes on to explain that the original tone of the architectural elements was white, i.e. the main wall garland with a stucco decoration, then the whole visible section up to the window openings, the archivolt profiles and the extensions above the chapels. The background of the stucco decoration on the main wall garland and the background of the ornaments on the choir wall was pink.³¹

With regard to Goldenstein's criticism we must be aware that this is just one side of the story. Lavrič says that the restoration was all along supervised by a professional building management office. In her opinion the reason for the more liberal beautification of the church was the fact that it was carried out with funds that had been collected and therefore had to be more liberal.³²

THE RESTORATION BY ANTON JEBACIČ (1905–1906)

An interesting description was found of the cathedral's interior in 1901: “It is sad that, as always, the ravages of time that sooner or later spoil everything have also had an effect here. It is most noticeable on the paintings. Some colours have darkened whilst others have faded and thus gradually the original beauty has been lost. A few problems were also caused by the artist.” The undersigned A.M. goes on to conclude: “The church has during these 200 years been repaired extensively only twice: in 1841 and 1859. [...] The interior is still beautiful. But many things, wall paintings in particular, will have to be given to a wise hand to carry out that which will be good for the church and will celebrate art. But it will have to be a truly wise hand!”³³ Steska said the following about the condition of Quaglio's paintings in the early 20th century:

³⁰ LAVRIČ 1996 a, p. 36.

³¹ ŽELEZNIK 1948, Poročilo. During his restoration (1944–1947) Železnik preserved the original white tone of the architectural elements with a slight hint of patina on the section above the main wall garland in order to achieve a correlation with the marble walls and the patina of the frescoes. However, he did leave out the pink tone of the ornament background on the presbytery walls and the main garland, because the ornaments were extensively gilded and the gold had already patinated; cf. LAVRIČ 1996 a, p. 31 with fn. 46. The dean and caretaker Franc Kimovec wrote that the stucco work that had been gilded by applying gold straight on top of whitewash, using first class manually thinned gold, had originally been white and slightly greyish-purple in the bottom section: KIMOVEC 1944–1954, Kronika, p. 28; cf. LAVRIČ 1996 a, p. 36 in fn. 68.

³² LAVRIČ 1996 a, p. 37.

³³ Zgodnja Danica, 1901, p. 44.

“The colours on the ceiling are unusually lively. The colour of the flesh is a strong red. The cinnabar next to the mouths has, sadly, blackened. It is a pity that the ceiling is quite cracked along the centre and that the paintings are barely visible under all the dust and soot that have collected over two centuries.”³⁴ He added meaningfully: “Now, after two hundred years, it is of course difficult to correctly judge their colours. Colours change through the years, they fade or even disappear. Who can thus judge them as they are now?”³⁵ – observations that still apply. A publication by the Society for Christian Art for the years 1903 to 1906 states that, overall, Quaglio's frescoes were well-preserved, and damaged or cracked only in a few sections, but that they were completely covered by a thick layer of dust and dirt.³⁶ Thus the wall paintings, due to the consequences of the 1895 earthquake, soot and other dirt, again needed restoring, especially in view of the preparations for the celebration in 1907 of the two hundredth anniversary of the consecration of the Baroque church. This restoration³⁷ is well known due to the preserved documents from the Archiepiscopal Archives Ljubljana, most of which were studied and published by Steska.³⁸ The preparations for the restoration of the interior began on 27 March 1901, when Prince Bishop Anton Bonaventura Jeglič called a meeting and consulted with the cathedral's Chapter.³⁹ The Prince Bishop's administrative office invited the Society for Christian Art to examine the cathedral and suggest repairs as the Society's cooperation was very important.⁴⁰

The restoration was managed by the Vicar General Janez Flis and supervised by the Central Commission for Art and Historic Monuments in Vienna. The work cost 120,000 krona.⁴¹ The restoration of Quaglio's wall paintings was entrusted to the painter **Anton Jebačič**⁴² (1850–1927). In 1903, Alois Riegel, a representative of the Central Commission, examined the cathedral and evaluated the

³⁴ STESKA 1903, p. 531.

³⁵ STESKA 1903, p. 532.

³⁶ Četrto izvestje, 1907, pp. 12–13.

³⁷ The restorations are mentioned in four articles in *Laibacher Zeitung*, 1902, p. 805, and 1905, pp. 1101, 1315, 1316, and 1906, p. 126, and articles in *Mitteilungen*, 1902, p. 152, and 1904, p. 398, and 1905, p. 458, and 1906, p. 185 (I wish to thank Dr. Andreas Lehne from the *Bundesdenkmalamt* in Vienna for his help and for this data); Četrto izvestje, 1907, pp. 12–13; STESKA 1924, pp. 38–42; SMOLE 1982; BERGAMINI 1994, p. 183; LAVRIČ 1996 a, p. 28 in fn. 22; LAVRIČ 2003 a, p. 59 in fn. 305 and p. 321 in fn. 622.

³⁸ STESKA 1924, pp. 38–42.

³⁹ Outline of the letter to the cathedral Chapter (27 March 1901): NŠAL, ŽA/Zg. zap., Ljubljana, sv. Nikolaj, fasc. 2, various documents.

⁴⁰ Četrto izvestje, 1907, p. 12.

⁴¹ STESKA 1924, p. 42.

⁴² Četrto izvestje, 1907, p. 12. During this period (1903), together with Joseph Kastner Jr., he painted in St Peter's church: STESKA 1924, p. 38. He lived in Ljubljana and was, as a representative of late Nazarene art of the second half of the 19th and early 20th century, an assistant to and collaborator of the following church painters: Janez Wolf, Jurij Šubic, Simon Ogrin, Joseph Kastner. He began working independently in the 1890s; see: ŽIGON 1982, pp. 66–84, 86–89, 91, 90–102, 121, 126–133; he also helped Matej Sternen with the restoration of the wall paintings in the chapels of the Franciscan church in Ljubljana: ZUZ 1925, p. 110.



Figure 6b: Jebačič became established through the restoration of Quaglio's wall painting in the Seminary Library in 1895.

restorer's abilities.⁴³ On 22 May 1903, the Central Commission issued the first instructions for the restoration of the frescoes: “[...] care should be taken in the restoration so that only cracks are filled, the frescoes are washed and nothing is overpainted.”⁴⁴ The next set of instructions was given in 1904 by the Society for Christian Art and under point four stated: “The wall frescoes around the entire church should be cleaned and washed, the cracks should be filled by a skilled person and the missing parts of the painting added. For carrying out this work we propose the painter Anton Jebačič, who has already proved himself as a restorer (of paintings in the Seminary Library),”⁴⁵ which he had restored after the earthquake in 1895 (figure 6b).⁴⁶ Steska wrote that an agreement had to be reached about the washing of the frescoes and the erection of the scaffolding and that the painter

⁴³ STESKA 1924, p. 38 taken from the letter by the Central Commission to the Ordinary's Office, 18 March 1903: NŠAL, ŽA/Zg. zap., Ljubljana, sv. Nikolaj, fasc. 2.

⁴⁴ STESKA 1924, p. 38 taken from the letter by the Central Commission to the Ordinary's Office, 22 May 1903: NŠAL, ŽA/Zg. zap., Ljubljana, sv. Nikolaj, fasc. 2.

⁴⁵ From the draft of the letter from the Ordinary's Office to the cathedral administration (28 September 1904) we see that the Society Chairman Canon Josip Smrekar and committee members (Andrej Zamejic, Janez Flis, Ivan Sušnik, Josip Erker, Josip Dostal; more on the Society: ŽIGON 1982, p. 30) examined the cathedral and created a list of urgent repairs; the cathedral administration was expected to provide the funds: NŠAL, ŽA/Zg. zap., Ljubljana, sv. Nikolaj, fasc. 2; published already: STESKA 1924, pp. 38–39.

⁴⁶ STESKA 1924, p. 38 taken from a letter of the Ordinary's Office to the provincial administration, 7 July 1905; NŠAL, ŽA/Zg. zap., Ljubljana, sv. Nikolaj, fasc. 2. A proof that the wall paintings in the Seminary Library were restored is also the inscription: “Restaur. 1895” on the right above the entrance.



Figure 6c: On 27 June 1905 Slovenski narod published a severe critique of Jebačič's restoration.

should begin as soon as possible.⁴⁷ The work commenced in April 1905, when the mason Simon Treo erected scaffolding in the first part of the church. An interesting description can be found in the newspaper *Zgodnja Danica*, 26 May 1905, where it says that the Ljubljana Cathedral was making serious preparations for its anniversary; that after the Second Sunday of Easter huge scaffolding began to be erected inside the church, supported by tall supports and the cornices. "Now that the holy part and the space under the dome has scaffolding, the restoration of the darkened paintings and decoration can begin. The restorations, that will involve huge expense, may last two years."⁴⁸ Steska said that between June and 16 December, Jebačič cleaned the frescoes in the presbytery, in the transept and beneath the dome. On 6 June 1905, the Provincial authorities sent a letter to the cathedral parish office, asking about the work in the cathedral, especially whether it would really be Jebačič who would restore the frescoes,⁴⁹ as criticism of the restoration of the cathedral frescoes had arisen around that time⁵⁰ (figures 6c, 6d). As an example, let us quote an article that appeared in the newspaper *Slovenski narod* on 26 and 27 June 1905, which offers an insight into the conflicts that emerged; the anonymous writer even mentions

a complaint sent to the Central Commission. The writer, after a short historical introduction, wrote that the frescoes had been "washed" a number of times during Langus's restoration and lastly twenty years earlier (in 1885, but it is unclear which restoration this was), emphasising that what the frescoes really needed was a true professional restoration, especially as 70,000 krona had been earmarked for this purpose. The vault was visibly damaged in the earthquake, "crack next to crack", and the wall paintings in the presbytery were also in a bad state. The writer goes on to wonder about the manner in which the restoration should be carried out because whether the frescoes remain or disappear was strongly dependent on this, but the choice of the restorer indicated that they would disappear "as soon as his unskilled hand touches them." He stresses that the restoration should have been done only by a restorer who is himself "a true artist; he must value the original, know why a particular painting is a masterpiece. Secondly, the restorer must be able to step into the creator's shoes and identify his goals. Thirdly, he must have such a mastery of skill and technique that he is able to follow the original without difficulty. He must be led by high artistic reason and must have a feel for application that only flexible artistic spirits are capable of. [...] It is good here to draw a parallel between Quagliotto and the present restorer. [...] the chosen restorer has hitherto moved within the confines of craftsmanship [...] he does not have any academic education in art and is self-taught [...]. Let us ask him if he truly dares to undertake such a task and whether he thinks the result may actually be of harm to him." The author of the article does not mention the restorer's name, but we can only assume that it is Jebačič. He also draws attention to the fact that the Central Commission should answer the question whether they were familiar at all with the issues and whether they were really going to agree to the

⁴⁷ STESKA 1924, p. 39 taken from the letter sent by the cathedral Chapter (signed by the cathedral's provost Kulavic) to the Ordinary's Office (30 March 1905); NŠAL, ŽA/Zg. zap., Ljubljana, sv. Nikolaj, fasc. 2.

⁴⁸ *Zgodnja Danica*, 1905, p. 168.

⁴⁹ Letter: Zl. 12.898: NŠAL, ŽA/Zg. zap., Ljubljana, sv. Nikolaj, fasc. 2; STESKA 1924, p. 39.

⁵⁰ *Mitteilungen*, 1905, pp. 458–459 (for Carniola written by ref. Max Dvořák) and 1906, p. 186 (where it says: "Die Restaurierung der Malereien Quaglios im Langhause erfolgte nach dem Berichte des Gen.-Konserv. zwar in pietätvollere Weise als jene im Chor, kann aber vom Standpunkte der Denkmalspflege auch nicht als einwandfrei bezeichnet werden."); Carniola, 1908, p. 229; *Peto izvestje*, 1913, p. 18.

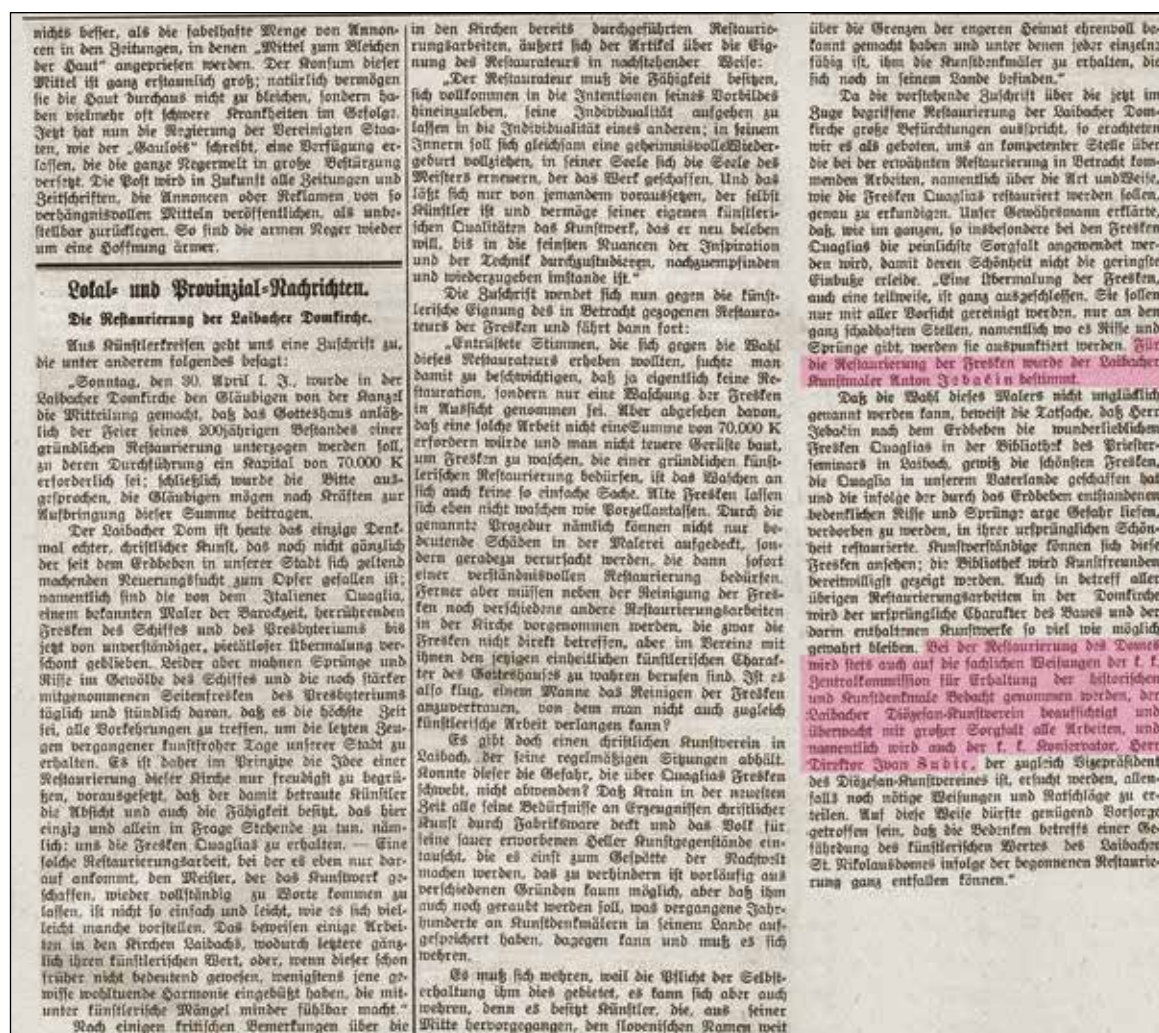


Figure 6d: On 28 June 1905 Laibacher Zeitung printed an article with a detailed explanation of the restoration.

restoration of Quagliotto's paintings.⁵¹ The Ordinary's Office responded defensively to the criticism. The outline of the letter (of 7 July 1905) addressed by the Ordinary's Office to the Provincial authorities reveals that carefully drawn up plans were submitted to the Central Commission and to the conservator Ivan Šubic early enough and that Jebačič proved his restoration abilities with the restoration of the wall paintings in the Seminary Library. The letter also states that on 11 November 1904 they had received an answer to their report (letter no. 2078), about which the conservator had been informed. They also write that the Ordinary's Office "acted correctly with regard to the whole project", whilst they were surprised at how "the ministry can listen to people who object either out of ignorance because they do not know the paintings and can not judge them, or because they want to ruffle a few feathers, and at how the ministry can believe such people more than the qualified experts." They add that

the conservator, whose duty it was to supervise the work and report on it, could submit more detailed explanations should the Provincial government wish so.⁵² The final outcome of the conflict was that the ministry's demands were sent to the diocesan authorities on 20 October 1905: "[...] with regard to the cleaning of the frescoes in the nave, the work should wait for an expert who will examine the church shortly [...]."⁵³ The Ordinary's Office agreed with the demands, whilst the Central Commission really did send the art historian and curator of Austrian national monuments Max Dvořák and the painter Hans Viertelberger, who immediately examined the restoration treatments carried out thus far and pointed out the mistakes. Under point three they wrote: "With regard to the wall paintings, the restorer did too much by adding some missing parts, consolidation the

⁵² The draft of the letter (7 July 1905) from the Ordinary's Office to the Provincial Government: NŠAL, ŽA/Zg. zap., Ljubljana, sv. Nikolaj, fasc. 2.

⁵³ In addition, they expressed criticism of the arbitrary use of yellow paint instead of gold: STESKA 1924, p. 39. For more on the criticism of the gilding of the stucco work in the presbytery see: *Peto izvestje*, 1913, p. 18.

nichtes besser, als die fabelhafte Menge von Annahmen in den Zeitungen, in denen Mittel zum Kleben der Gault" angepriesen werden. Der Konsum dieser Mittel ist ganz erträglich groß; natürlich vermögen sie die Gault durchaus nicht zu kleben, sondern haben vielmehr oft schwere Krankheiten im Gefolge. Jetzt hat nun die Regierung der Vereinigten Staaten, wie der "Gault" schreibt, eine Verfügung erlassen, die die ganze Welt in große Verärgerung versetzt. Die Post wird in Zukunft alle Zeitungen und Zeitungsblätter, die Annoncen oder Reklamen von so verhängnisvollen Mitteln beinhalten, als unbestimmbar zurückgehen. So sind die armen Regier wieder um eine Hoffnung ärmer.

Total- und Provinzial-Nachrichten.

Die Restaurierung der Laibacher Domkirche.

Das Künstlerstreifen geht um eine Aufschrift zu, die unter anderem folgendes befragt:

"Sonntag, den 30. April 1. J., wurde in der Laibacher Domkirche den Gängen von der Kanzel die Mitteilung gemacht, daß das Gotteshaus anlässlich der Feier seines 200-jährigen Bestandes eine glänzende Restaurierung unterzogen werden soll, zu deren Durchführung ein Kapital von 70.000 K. erforderlich sei; schließlich wurde die Bitte ausgesprochen, die Gängen mögen nach Kräften zur Ausbringung dieser Summe beitragen.

Der Laibacher Dom ist heute das einzige Denkmal alter, schriftlicher Kunst, das noch nicht gänzlich der Zeit dem Erbdecker in unserer Stadt sich geliehenden Feuerungsflucht zum Opfer gefallen ist; namentlich sind die von dem Italiener Quagliotto, einem bekannten Maler der Barockzeit, herrührenden Fresken des Schiffes und des Presbyteriums bis jetzt von unberührender, weil ihrer Übermalung verschont geblieben. Reider aber möhen Sprünge und Risse im Gewölbe des Schiffes und die noch stärker mitgenommenen Seitenfresken des Presbyteriums täglich und stündlich daran, daß es die Schätze Zeit ist, alle Vorkehrungen zu treffen, um die letzten Reste zu erhalten. Es ist daher im Prinzip die Idee einer Restaurierung dieser Kirche nur freudig zu begrüßen, vorausgesetzt, daß der damit betraute Künstler die Pflicht und auch die Fähigkeit besitzt, das hier einzig und allein in Frage stehende zu tun, nämlich: uns die Fresken Quagliotto zu erhalten. — Eine solche Restaurierungsarbeit, bei der es eben nur darauf ankommt, den Meister, der das Kunstwerk geschaffen, wieder vollständig zu Worte kommen zu lassen, ist nicht so einfach und leicht, wie es sich vielleicht manche vorstellen. Das beweisen einige Arbeiten in den Kirchen Laibachs, wodurch letztere gänzlich ihren künstlerischen Wert, aber, wenn dieser schon früher nicht bedeutend gewesen, wenigstens jene gewisse wohlthuende Harmonie eingebüßt haben, die mitunter künstlerische Wängel minder fühlbar macht."

Rach einigen kritischen Bemerkungen über die

in den Kirchen bereits durchgeführten Restaurierungsarbeiten, äußert sich der Artikel über die Signatur des Restaurateurs in nachfolgender Weise: "Der Restaurateur muß die Fähigkeit besitzen, sich vollkommen in die Intentionen seines Vorbildes hineinzuleben, seine Individualität aufgeben zu lassen in die Individualität eines anderen; in seinem Innern soll sich gleichsam eine geheimnisvolle Wiedergeburt vollziehen, in seiner Seele sich die Seele des Meisters erneuern, der das Werk geschaffen. Und das läßt sich nur von jemandem voraussetzen, der selbst Künstler ist und bemerkt eigenen künstlerischen Qualitäten das Kunstwerk, das er nun beleben will, bis in die feinsten Nuancen der Inspiration und der Technik durchzudringen, nachempfinden und wiederzugeben imstande ist."

Die Aufschrift wendet sich nun gegen die künstlerische Signatur des in Betracht gezogenen Restaurateurs der Fresken und führt dann fort:

"Entrüstete Stimmen, die sich gegen die Wohl dieses Restaurateurs erheben wollten, suchte man damit zu beschwichtigen, daß es eigentlich keine Restauration, sondern nur eine Wahrung der Fresken in Rücksicht genommen sei. Aber abgesehen davon, daß eine solche Arbeit nicht eine Summe von 70.000 K. erfordern würde und man nicht neuere Verhältnisse durch Fresken zu wahren, die einer gründlichen Restaurierung bedürfen, ist das Kleben an sich eben nicht weniger ein Verfallakt. Durch die genannten Vorgänge nämlich können nicht nur bedeutende Schäden in der Malerei aufgedeckt, sondern geradezu verursacht werden, die dann sofort einer verständnisvollen Restaurierung bedürfen. Ferner aber müssen wegen der Reinigung der Fresken noch verschiedene andere Restaurierungsarbeiten in der Kirche vorgenommen werden, die zwar die Fresken nicht direkt betreffen, aber im Vereine mit ihnen den jähigen einheitlichen künstlerischen Charakter des Gotteshauses zu wahren berufen sind. Ist es also frag, einem Manne das Reinigen der Fresken anzuvertrauen, von dem man nicht auch zugleich künstlerische Arbeit verlangen kann?"

Es gibt doch einen christlichen Künstlerverein in Laibach, der seine regelmäßigen Sitzungen abhält. Kommt dieser die Gefahr, die über Quagliotto's Fresken droht, nicht abzuwenden? Doch strein in der neuesten Zeit alle seine Bedürfnisse an Erzeugnissen christlicher Kunst durch Subskriptionen deckt und das Volk für seine lauer erworbenen Werke Kunstgegenstände einsetzt, die es einst zum Gelächter der Nachwelt machen werden, das zu verhindern ist vorläufig aus verdringenden Gründen kaum möglich, aber doch ihm auch noch versucht werden soll, was vergangene Jahrhunderte an Kunstfertigkeiten in seinem Lande angestrichelt haben, dagegen kann und muß es sich wehren.

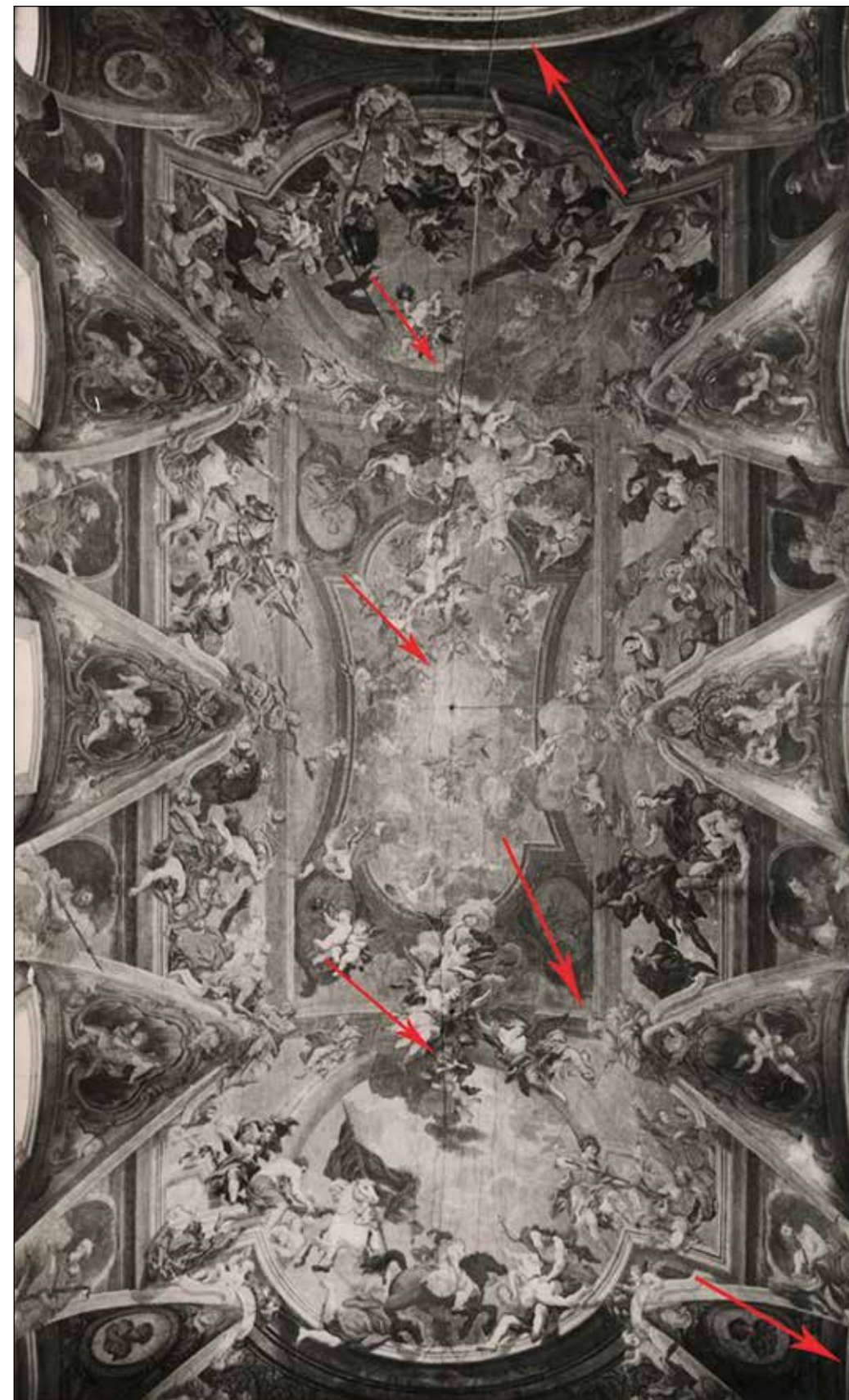
Es muß sich wehren, weil die Pflicht der Selbstbehaltung ihm dies gebietet, es kann sich aber auch wehren, denn es besitzt Künstler, die, aus keiner Witter herorgegangen, den florentinischen Namen weit über die Grenzen der engeren Heimat ehrenvoll lokom gemacht haben und unter denen jeder einsteig fähig ist, um die Kunstfertigkeiten zu erhalten, die sich noch in seinem Lande befinden."

Da die vorstehende Aufschrift über die jetzt im Zuge begriffene Restaurierung der Laibacher Domkirche große Befürchtungen ausdrückt, so ersuchen wir es als geboten, uns an kompetenter Stelle über die bei der erwähnten Restaurierung in Betracht kommenden Arbeiten, namentlich über die Art und Weise, wie die Fresken Quagliotto restauriert werden sollen, genau zu erkundigen. Unter Berücksichtigung dessen, daß, wie im vorigen, so insbesondere bei den Fresken Quagliotto die reichlichste Sorgfalt angewandt werden muß, damit deren Schönheit nicht die geringste Einbuße erleide. Eine Übermalung der Fresken, auch eine teilweise, ist ganz ausgeschlossen. Sie sollen nur mit aller Beachtung gereinigt werden, nur an den ganz schadhaften Stellen, namentlich wo es Risse und Sprünge gibt, werden sie auspunktirt werden. Für die Restaurierung der Fresken wurde der Laibacher Malermeister Anton Jebačič bestimmt.

Daß die Wohl dieses Wälers nicht unglücklich genannt werden kann, beweist die Tatsache, daß Herr Jebačič nach dem Erbdecker die wunderlichste Fresken Quagliotto in der Bibliothek des Präbiterienfeminaris in Laibach, groß die schönsten Fresken, die Quagliotto in unleren Lande gezeichnet hat und die letztere der durch das Erdbeben entstandenen bedauerlichen Risse und Sprünge argem Gelehrte, verstorben zu werden, in ihrer ursprünglichen Schönheit restaurierte. Kunstverständige können sich diese Fresken ansehen; die Bibliothek wird Kunstfreunden bereitwillig gezeigt werden. Auch in betreff aller übrigen Restaurierungsarbeiten in der Domkirche wird der ursprüngliche Charakter des Baues und der darin enthaltenen Kunstwerke so viel wie möglich gewahrt bleiben. Bei der Restaurierung des Domes wird hies auch auf die fälschlichen Bemalungen der 1. Zentralkommission für Erhaltung der historischen und Kunstdenkmale Bedacht genommen werden, der Laibacher Malermeister Anton Jebačič bestimmt und übermüht mit großer Sorgfalt alle Arbeiten, und namentlich wird auch der 1. Zentralkommission, Herr Direktor Joann Sabljic, der zugleich Vizepräsident des Diözesan-Kunstvereines ist, ersucht werden, allenfalls noch nötige Bemalungen und Restitutions zu erteilen. Auf diese Weise dürfte genügend Vorkehrung getroffen sein, daß die Bedeutung dieser Gefährdung des künstlerischen Wertes des Laibacher St. Nikolausklosters infolge der begonnenen Restaurierung ganz entfallen können."



Figure 7a: A high quality photograph of the nave vault, photographer and date unknown, shows the condition of the painting after Jebačič's restoration. The vault painting appears "cleaned", there are no darkened cracks or stains; the arch painting is already visible.



Figures 8a and 8b: The condition of the wall paintings in the 1940s, thought to be taken in 1941.
Figure 8a: France Stele's photograph of the nave vault painting showing cracks, with the arch wall painting, but no damage caused by damp (e.g. the head of *Bonitas*).



Figure 8b: A shot of the interior looking north-westwards, perhaps taken by Peter Železnik, with visible damages in the area adjacent to the bell tower and the decorative painting on the blind window.

weaker contours and overpainting a few sections. [...] The wall paintings in the nave should only be washed and the cracks should be filled and coated with neutral colours.⁵⁴

It seems that the criticism in the newspapers was justified. Steska quotes the reply of the Ordinary's Office offering assurances that the restoration was necessary due to the dirt which had almost obliterated the frescoes. The wall paintings were for this reason "washed", the damaged sections "carefully filled with wax paints", whilst due to the generally good condition of the paintings, larger treatments were not necessary. However, the Ordinary's Office opposed the Central Commission's opinion "that nothing should be repaired or renewed in churches because churches are like museums where experts can study the techniques of old works of art", saying that in museums paintings also get repaired. They were convinced that whilst "washing" the frescoes they had not "sinned against artistic requirements" and that the visual difference as it appeared then (in 1905)

⁵⁴ Point by point they also submitted a negative opinion about the inappropriate gilding of the frames of the wall paintings, the unsuitable coloured windows, the cleaning of the organ cases; from STESKA 1924, pp. 39–40, based on the letter by the provincial government (28 February 1906) to the Ordinary's Office: NŠAL, ŽA/Zg. zap., Ljubljana, sv. Nikolaj, fasc. 2.

between the paintings in the presbytery and those in the nave was the result of the paintings in the nave not having been cleaned.⁵⁵ In the publication *Četrto izvestje* from 1907 it says that the work was supervised, that everything was done in line with the given advice and "that the restoration had finally succeeded completely without any disharmony [...]. The Society for Christian Art claims with a clear conscience that during the restoration of the cathedral, particularly of Quaglio's wall paintings [...] nothing had been done that was against the rules applying to the preservation and restoration of artistic monuments."⁵⁶

In his article Steska continues with a description of Jebačin's restoration of the nave vault. He began to "wash" the frescoes after Easter of 1906. "With much effort, he filled in the cracks in the middle of the ceiling and painted them in harmony with the other paintings in such a way that it can not be seen where the cracks had been."⁵⁷ This quote is at the same time the last mention of the restoration. We could find no trace of more detailed information about the restoration of the nave vault painting, just the fact that Dostal is thought

⁵⁵ STESKA 1924, p. 40.

⁵⁶ *Četrto izvestje*, 1907, pp. 12–13.

⁵⁷ STESKA 1924, p. 40, wrote that the restoration continued until 1914.

to have photographed the paintings during the "restoration of 1907" for the Society of Christian Art⁵⁸ (figure 7a).

In his report *Način izvedbe in ugotovitve konservatorskega in restavratorskega značaja* (The manner of application and the conclusions of conservation and restoration character) Peter Železnik in 1948 describes some of the consequences of Jebačin's restoration. As Železnik's own restoration between 1944 and 1947 did not include the nave vault, his observations apply more to the other wall paintings. He writes that due to leaks and inappropriate cleaning and restoration forty years earlier "parts of the frescoes in the chapels suffered". Moreover, "during the penultimate cleaning the frescoes were washed with soapy water and repaired with oil and clay based paints, which is why mould and additional paint had to be removed and restored in the secco a fresco technique to the permitted measure and in the permitted manner."⁵⁹

During the last restoration (2002–2006) we observed similar problems with regard to the nave vault painting. During the mechanical removal of dirt, we noticed some small areas of oil paint application that had been carried out as retouches on the puttied sections, along the edges of the *giornate* and in the overpainted sections. We also noticed overpainting that had been carried out in order to unify the retouched cracks and fillings with the surrounding areas.⁶⁰ This overpainting was criticised in connection with Jebačin's restoration by the Central Commission.

THE RESTORATION BY PETER ŽELEZNIK (1944–1948)

In the Ljubljana Cathedral inventory from 1951 it says that "the frescoes were first washed in 1910 by the painter A. Jebačin and then between 1945 and 1947 all the pictures in the side chapels and by the main altar were washed by the painter Železnik."⁶¹ We also found out that the church was newly whitewashed up to the extensions above the windows, that the marbled sections were washed, the side choirs and the profiled cornices above the pilasters were whitewashed and all the stucco work in the church was cleaned. In a circular from 1975 it says that in addition to the wall paintings in the dome and the nave vault, the cathedral was again cleaned during

⁵⁸ *Četrto izvestje*, 1907, p. 12–13. The photographs were published in the review *Bogoljub* during 1907, 1935, 1937, 1939–1940, 1944 (already drawn attention to by Lavrič in fn. 622: DOLNIČAR 2003, p. 321). In the photographic archive of the France Stele Institute of Art History of the Scientific Research Centre of the Slovenian Academy of Sciences and Arts there are a few photographs and negatives that are identical to those from *Bogoljub* (the positives are held by the INDOK Centre at the Ministry of Culture of the Republic of Slovenia = MK INDOK Centre).

⁵⁹ ŽELEZNIK 1948, *Poročilo*.

⁶⁰ The overpaintings or retouches on the black background in the niches behind the apostles appeared as the shading of the parts of draperies on the exaggeratedly strengthened contours that had gone dark and stood out prominently (e.g. the edges of *giornate*).

⁶¹ *Inventar imovine stolne cerkve sv. Nikolaja v Ljubljani [...] (III. Notranji okras)*: NŠAL, ŽA, Ljubljana, sv. Nikolaj – stolnica, fasc. 22, in 1951. The year 1910 is most likely a mistake.

the Second World War.⁶² In the parish chronicle in his entry for 28 August 1946 France Kimovec said: "The frescoes in the vault must not yet be washed because they are still clearly visible. During a wash they always suffer a little [...]."⁶³ The third more extensive restoration is the one carried out by Peter Železnik (1902–1974) (figure 9a), which is relatively well documented. From the estimates, bills, receipts and his report we can find out a great deal more about the treatments on the wall paintings than was hitherto possible. In addition, the testimony by Železnik's assistant, the painter Ivan Marinšek, who was sixteen years old at the time, offers us a clearer idea about the materials used, the work itself and his cooperation with the restorer,⁶⁴ as well as about the time and conditions. Moreover, another record of the restoration treatments was consistently kept by the Dean of the cathedral Dr. France Kimovec in his *Kronika* (figure 9c).⁶⁵ On the basis of an agreement with Kimovec, Železnik issued three estimates with all the suggested and listed restoration treatments. From the estimate dated 26 May 1944, it is clear that he had "cleaned a fresco and three oil wax paintings and painted the other surfaces in the sacristy", using the lime technique; all the tasks are listed separately.⁶⁶ From the estimate dated 25 June 1944, which Železnik issued on the basis of the explanations given by Dean Kimovec and Professor Dr. France Mesesnel, it is clear that he "cleaned and retouched" all the frescoes below the main wall garland in the transept and in the nave chapels. He presented the proposed tasks by points.⁶⁷ On the 17 January 1945, he issued a bill for the painting, gilding and carpentry work that he had listed in all three estimates.⁶⁸

In his report on the cleaning and restoration of Quaglio's frescoes and the toning of other surfaces in 1948, Železnik

⁶² 1707–1957: *Okrožnica: 250-letnica posvečenja ljubljanske stolnice*, the Ordinary's Office in Ljubljana, 27 April 1957, p. 3 (signed by Bishop Anton Vovk): NŠAL, ŽA, Ljubljana – sv. Nikolaj, fasc. 12. The restoration is mentioned in: VS 1948, p. 10, and VS 1949, p. 45.

⁶³ KIMOVEC 1944–1954, *Kronika*, p. 52.

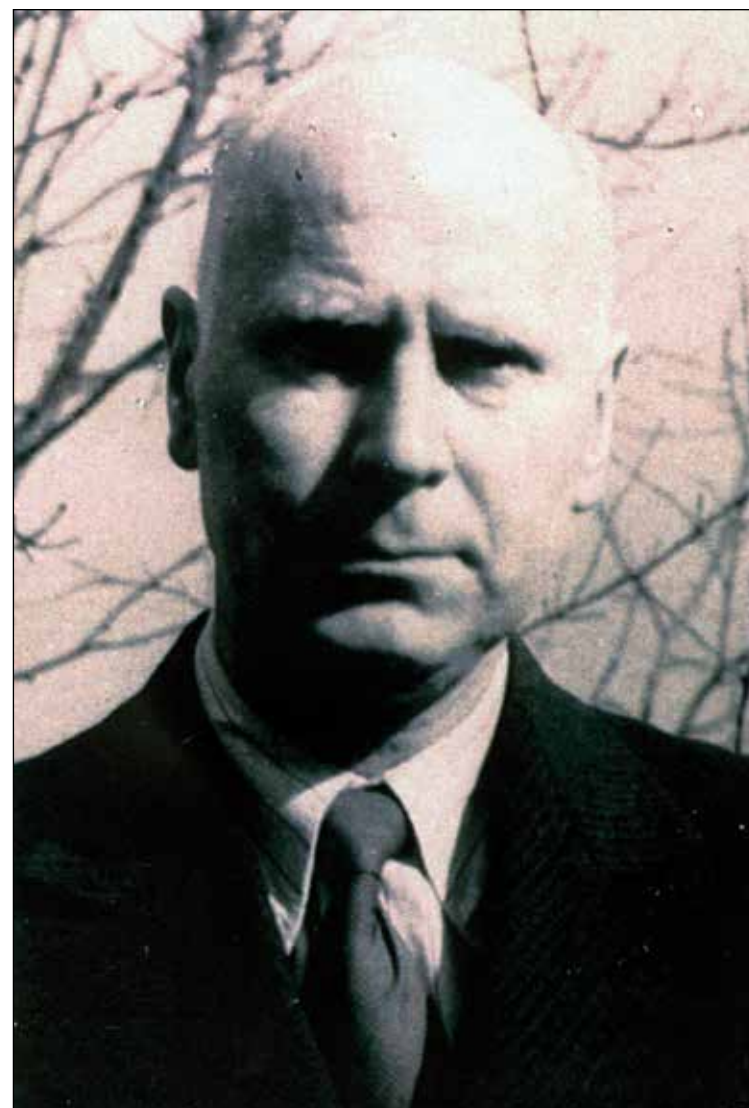
⁶⁴ Usually, Železnik would carry out all the work himself for minimum pay; the only assistant that we know of was Marinšek, who worked with Železnik between 1947 and 1949 on the restoration of the two chapels in the transept and the last four chapels at the entrance to the nave (in 1955 Železnik again invited him and tried to persuade him to take part in "a big job at the cathedral", but Marinšek refused as he already had a job; in the end, in spite of health problems, Železnik is thought to have done all the work himself). Marinšek described Železnik's work as very exact: he never overpainted, worked only with lime, used casein only in the lower sections of chapels that did not have wall paintings on them, so that the surface would not be wiped. As the black dirt from soot, dust and cobwebs was too stubborn, they did not clean with semi dry bread, as was customary at the time, but first very lightly with brushes and then with warm water and sea sponges. Where the colour layer was blistering, they first fastened it back with silk paper and a brush, sprayed the area with a consolidant (Wasserglas – water glass) and then carefully washed the surface: this is a summary of a talk with Ivan Marinšek, whom I wish to thank for valuable information, in Pšata, December 2005: ZVKDS RC archive.

⁶⁵ KIMOVEC, 1944–1954, *Kronika*.

⁶⁶ ŽELEZNIK, 26 May 1944, *Proračun*.

⁶⁷ ŽELEZNIK, 25 June 1944, *Proračun*.

⁶⁸ ŽELEZNIK, 1945, *Račun*. Numerous bills and confirmations of receipt have been preserved (1944): NŠAL, ŽA, Ljubljana – sv. Nikolaj, fasc. 26, documents – various.



a



Figures 9a–9c: The third “restorer” of the cathedral wall paintings Peter Železnik (9a) described his restoration in a detailed report: ŽELEZNIK 1948, Poročilo (9b). The cathedral's dean described the restoration in the parish chronicle: KIMOVEC 1944–1954, Kronika (9c).

Poročilo o čiščenju in restavriranju Quarlievih fresk in toniranju ostalih ploekov stebnice sv. Nikolaja v Ljubljani.

Fredmetna dela, kotera so bila poverjena podpisaneu v juniju leta 1944 od škofiškega odinanjatu in nazorovana od Spomeniškega urada, oziroma Zafoda za varstvo spomenikov, so se zaradi vojnih razmer, bolezni in njih posledic vrstile v več etapah in sticer:

V letu 1944 čiščenje pozlačenih kapitelov, stebnatih okrasikov na glavnem zidnem vencu ter beljenje istega, nadalje čiščenje in restavriranje stenskih fresk v prečni lajpi in čiščenje freske na zakristijskem avodu.

V letu 1945 se je izvršilo toniranje 2m visokega pasu na nad glavnim sfidnim vencem do okenskih špalet s čiščenjem vseh fresk-marbournih polnil, čiščenje in restavriranje fresk v Andrejevi kapeli ter toniranje nefreskiranih (delov) ploekov pod korom, stranski vhodov in križni kapeli.

V letu 1946 in 47 čiščenje in restavriranje ostalih petih kapel in korne stene imenovane stebnice.

...kačin izvedbe in uprotivne konservatorskega in restavratorskega značaja:

V pri toniranju močno povzduženih in lepotahtnih arhitekturnih členov, ki krase stebnico in bogato okvirjajo Quarlieve freske, se je bilo osirati na prvotni ton, ki se bil gotovo dan po freskantu in znanu Quagliu, v kolikor so to doposicale poznatitve in poznejše marnorne izsvedba.

Prvotni ton arhitekturnih členov stebnice je bil bel in sicer: Glavni sfidni venec s stebnatimi okrasima, nadalje vsa sfidna pas do okenskih špalet ter arhitektni profili in sadiški vseh kapel.

Slopi, ki so sedaj marnornirani so bili svetlostvi. Ozka tje stebnatnega ukrasa na glavnem zidnem vencu in ostanje okrasikov ne karoli steud je bilo izvedeno v roza barvi.

V Langusovi dobi in posejje so se stebnatni okraji, ornamenli in kapiteli pozlatili, slopi in stene pa marnornirale v steklostro marnornju.

V glavnem prevladuje sedaj v arhitekturi prvotni beli ton z rahlim ruzično patine na stebnatih pasu nad glavnim sfidnim vencem, je ima sroj z marnornirani stebnimi in fresco patino. In ostal je roza ton na ozadju ornamentov korue stene in dv glavna vencu, ker so ornamenli bogato pozlačeni in slato se patinirano.

Pozlatitev ornamentov, sicer s pravim slatom, je bilo pred 80 leti izvršena na okrajno drobno karelinjo, v drugie v pravilno postopku. Ornamenti so bili pred ton se najslaj pertrub beljeni in finese istih močno zatiti.

Vsi ti nedostatki niso ovržali takratnega podjetnika ter je sel kar preko njih ne senoč se niti za obrte in ustane dele. Da ni sadostne visine bi bila ta površnost močno opreana.

Se slabše se je postopalo s pozlačenjem kapitelov, ki so slučni tudi s pravim slatom, a na istih tehniki, ki ne prenese zadostnega čiščenja in je močno dovzetna za toplotne spremembe.

Čiščenje fresk se je vršilo s obsejnim režimom čiščenja in do freske tehnikično najoljšše v srednji lajpi marnornirana oltarja s skorajo karelinjo, kotere spušča del na vol svetlosti od Langusa dalje. Tam kjer se sedaj spušča točno navede vse do slivne senočja, tje je sedaj marnornirana, ki bilo navedeno, pač pa sta bila marnornirana na vsodi skatul do do svetlosti. Pri oltarju sv. Ned. Telega je to sfidni oltarji preterobolite so točno okrajanost tobi freske v karelinji karelinji in korne na vseh sfidni lajpi.

Pri so trepla freske varali zama zrna in nepostilno pa čiščati in restavrira pred 40 leti, je toak v obdelkih marnornir. Ter se ne v upredmetnim čiščenju ter se vedne s slatno, marnorniralo se v obdelkih in ki marnorniralo, se bilo postrebiti čiščenja in toniranju obstruditi in restavrira v senci marnornirano ter dovoljni marnornir in marnornir.

Glede znamkaja se bila izvedena načrtna deln in tono mavčila za pravilno čiščenje nadkapelnih prostorov.

V sfidnih kružnih kapelah je bilo oradia prvotno marnornirano s puti drščini vitolitearto karelinjo in v sadiški vseh kapelah marnornirani ostatali in karelinji.

Tehniko so freske v karelinji in sfidni karelinji (vsak karelinji marnornir in karelinji karelinji). Če so bile marnornirane, se je prevlečene s sivi apno, in in roza marnornir fresk karelinji. Če so bile čiščeni, da se marnornir fresco ostan kor na obiti na karelinji ostan in postoj. Če so bile marnornirane, zaradi teh dveh nedostatkov so se freske restavrira hitro marnornir in marnornirane ostanosti, kater bi se v marnornirane marnornirale.

Slopi in léki so bili zadajkrat prevlečeni s marnornirano tonom, ki se je sedaj odstranili in vneljavli prvini.

V Ljubljani 15. 2. 1948. Železnik P.

Table with columns for year, location, and work details. Includes entries for 1927, 1928, 1948, etc., listing restoration work on various parts of the cathedral.

Table with columns for year and work details. Includes entries for 1948, 1949, 1950, etc., listing restoration work on various parts of the cathedral.

Figure 10a: The fourth larger restoration of the wall paintings, or the third one with regard to the nave vault, also by Peter Železnik, is attested by a list of locations he worked on during the period between 1927 and 1968.

wrote that since June 1944 he had been working in the cathedral as commissioned by the Ordinary’s Office and supervised by the Cultural Monument Protection Office (figure 9b). Because of the war conditions and illness he worked in phases. In 1944 he cleaned the gilded capitals and the stucco ornamentation on the main wall garland, which he whitewashed, and cleaned and restored the wall paintings in the transept and in the vault of the vestry. In 1945, he toned a 2-metre high stretch above the main wall garland as far as the window openings, cleaned the in-between frescoed marble fillers, cleaned and restored the wall paintings in Andrew’s chapel and toned the undecorated surfaces under the choir, the side entrance and in the Holy Cross chapel. During 1946 and 1947 he cleaned and restored the remaining five chapels and the choir walls. We have also established that he “cleaned the wall paintings by gentle wet cleaning”. This method worked best on the wall paintings in the transept, with regard to which he was of the opinion that they had been executed best of all in terms of technique. In the following chapters we shall say more about other important conclusions, especially about the description of the conse-

quences of the older, particularly Langus’s restoration treatments, and about Železnik’s methods of work .

THE RESTORATION BY PETER ŽELEZNIK (1959–1961)

Not many documents are available regarding the restoration that took place in the late 1950s and early 1960s.70 In a document inserted into the cross on the dome, now kept in the Archiepiscopal Archives, it says that the cross was made in 1896 by the Ljubljana tinsmith Kregar and that it was restored and partly gilded in 1961, when during the preparations for the five hundredth anniversary of the Ljubljana diocese the whole exterior and interior of the cathedral were restored, as well as all the frescoes inside. The cost of this was covered exclusively by the gifts of the worshippers.71 In the archive of the INDOK Centre there are few documents

70 The restoration is imprecisely dated: SMOLE 1982: “In 1961 [...] the exterior was painted, the bells were covered [...]. Four years later Železnik restored Quaglio’s frescoes inside the church” and BERGAMINI 1994, p. 183, who gives the year of the restoration as 1965, which does not apply to the wall paintings, whilst the restoration from 1944 to 1948 is not mentioned here at all.

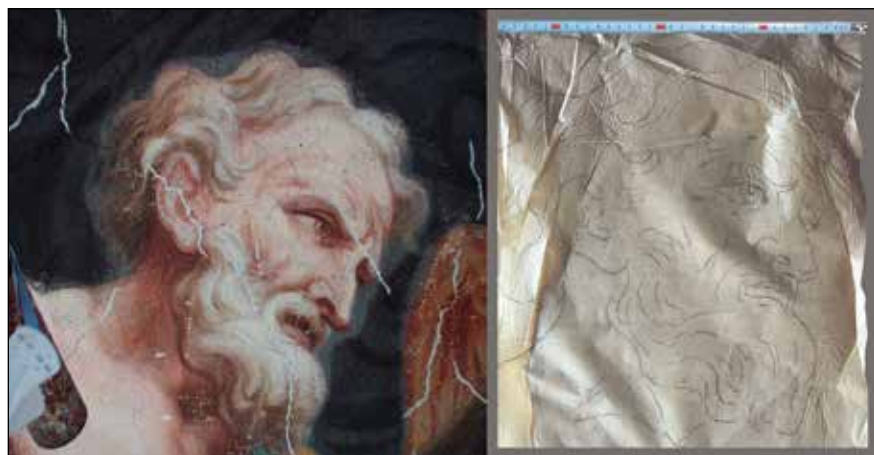
71 The document inserted into the cross on the roof of the Ljubljana cathedral dome in 1961, 1989 (signed by the head administrator of the cathedral Msgr. Prof. Venčeslav Snoj); NŠAL, ŽA/Zg, zap., Ljubljana – sv. Nikolaj, fasc. 2.

69 ŽELEZNIK 1948, Poročilo. The cooperation of all three is attested by documents (1944) from NŠAL, ŽA, Ljubljana – sv. Nikolaj, fasc. 27, various books – cash books – the register of all documents sent and received, official records between 18 June 1906 to 1944.

connected with the restoration treatments in the cathedral and what there is mostly refers to the restoration of the external wall paintings (1955-1964). In a document addressed by the administration of the cathedral on 21 March 1959 to the Institute for the Protection of Cultural Monuments LRS in Ljubljana (hereafter Institute), it says: “*The administration of the Cathedral of St Nicholas in Ljubljana wishes to cordially inform you that it intends to continue during this and next year with the restoration of the frescoes in the cathedral, specifically those on the nave ceiling and in the dome. The avowed expert restorer Mr Peter Železnik is willing to take on the task. As it is a general opinion that this restoration is much needed, we hope that the Institute will not object and we ask for permission to be granted.*”⁷²

On 6 April 1959, the Institute addressed a letter to the District People’s Committee, informing them that in line with Article 8 of the law on the protection of cultural and natural monuments they were passing on the application submitted by the cathedral’s administration to be decided on. In the last preserved document that the Institute addressed to the District People’s Committee on 28 May 1959, it says: “*We have found that you have appointed a special commission for the restoration of the frescoes in the Ljubljana Cathedral, consisting of three art historians. As this involves one of the most important monuments of wall paintings in Slovenia, it is our opinion that at least one technical expert should also be a part of such a commission. Thus we propose that the head of our Institute’s restoration department Professor Mirko Šubic, who has for ten years led all the conservation and restoration projects related to wall paintings and carried out by our Institute, is appointed to the commission.*”⁷³ In the conservation report in *Varstvo spomenikov* we can for 1961 find an important note that “*the restorer Peter Železnik cleaned and strengthened Langus’s frescoes in the dome and the lantern at the top of the dome*”⁷⁴ whilst the nave vault painting is not mentioned.

Sadly, we do not know much about the state of the nave vault painting in 1959, or why the restoration was necessary and how the restorer tackled the job, but we can from a preserved draft letter by Dean Kimovec learn the following: “*At the end of the magnificent festivities marking the five hundredth anniversary of the (arch)diocese, the cathedral Chapter together with the administration of the Ljubljana Cathedral remembers the special contribution that You have made with your lengthy masterful work, much admired by our visitors and gaining a great deal of praise [...]. In 1943 the preparations for*



Figures 10b–10d: a putto (10b); the face of an adult angel (10c) and the face of an old man offers an interesting comparison of typical Quaglio faces and figures on the nave vault with the drawings from Železnik’s legacy (10d).

⁷² A copy (*Restavracija fresk*) made by the cathedral administration (signed head administrator: Msgr. Prof. Venčeslav Snoj) addressed to the Institute, 21 March 1959: MK INDOK Centre, document archive.

⁷³ The document (*Restavriranje fresk v ljubljanski stolnici*) from the Institute, addressed to the District People’s Committee, secretary’s office for culture in Ljubljana (signed by the head Edo Turnher), 28 May 1959: MK INDOK Centre, document archive.

⁷⁴ ROZMAN 1963, p. 126. The paintings in the lantern were again cleaned and retouched in 1989; the project was led by Darko Tratar: BENEDIK 1990, p. 281. In the next issue of *VS* (1962–1964) we can in an article by Molé find a great deal about the treatments on the exterior surfaces: MOLÉ 1965 a, pp. 101–103.

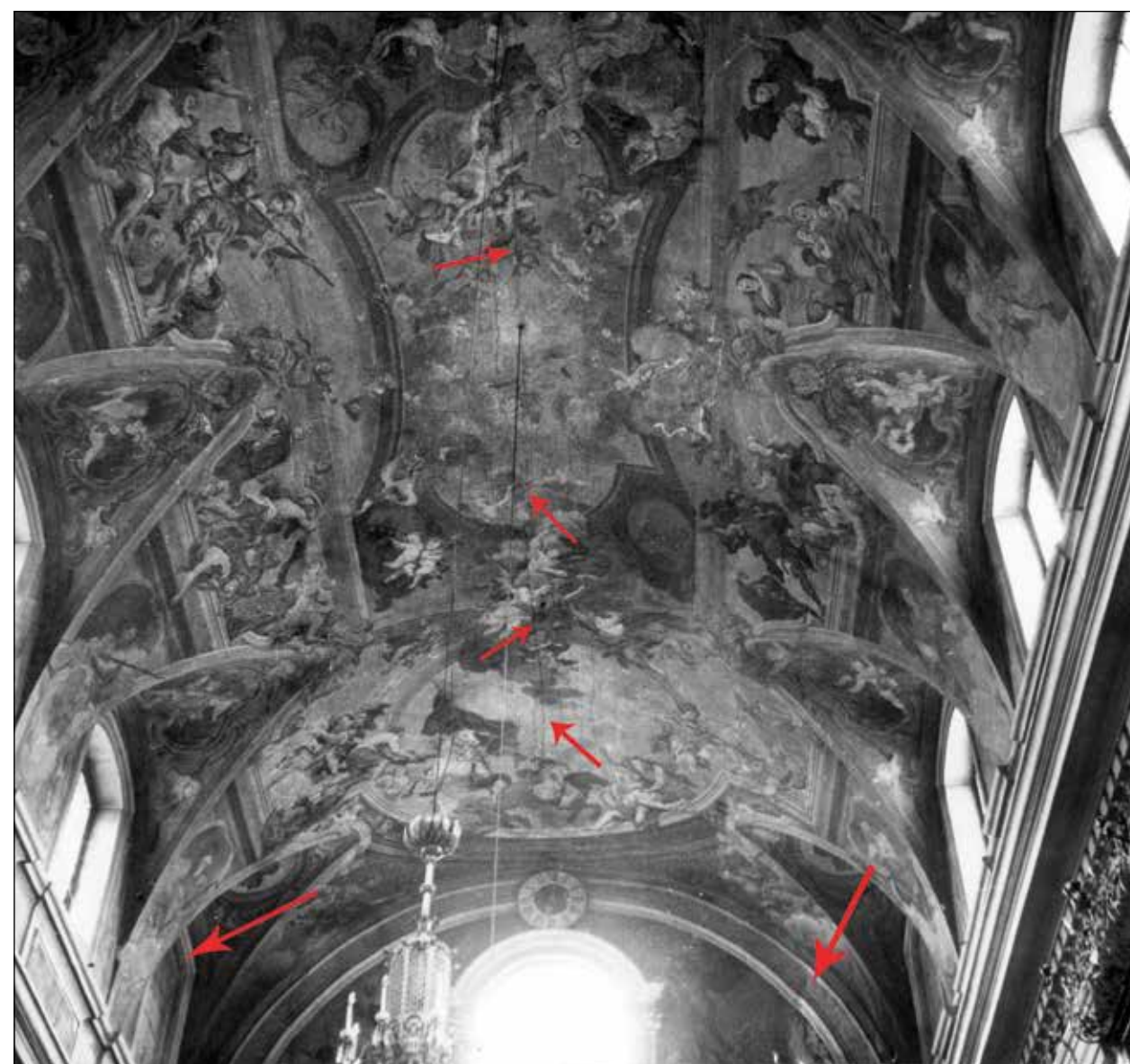
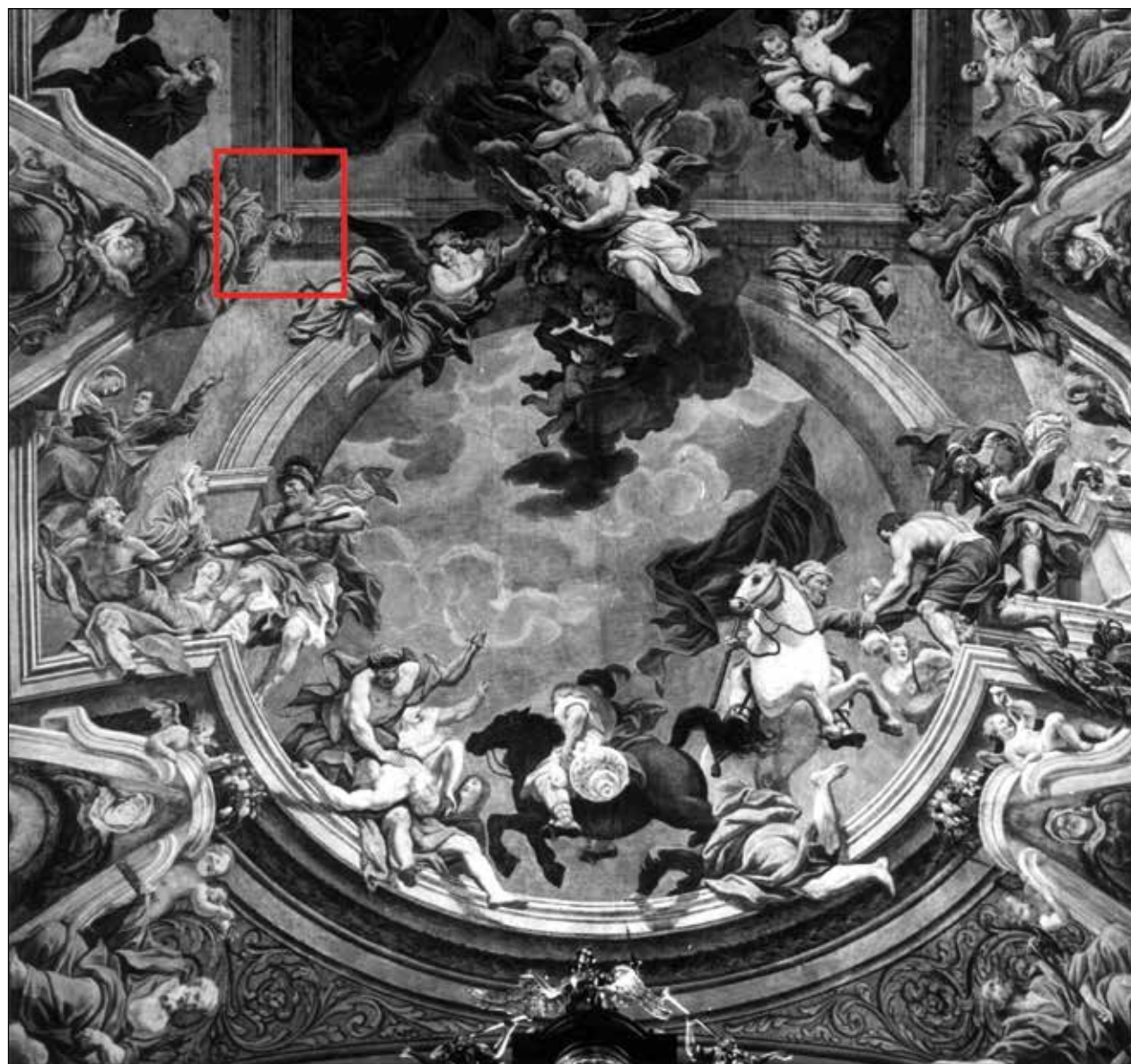


Figure 11a: The nave vault painting prior to Železnik’s restoration on a shot of the interior looking westwards, photographer and date unknown, shows cracks on the vault, damage in the north-western corner and the decorative painting on the southern blind window.

[...] so successfully completed anniversary [...] began with Your professional work. That is when You commenced your task using Your excellent expert technical knowledge [...] with great dedication and much physical effort, as most of the work was done under the arches, where time had caused unavoidable damage, You knew how to return this magnificent work of art its original splendour [...]. The study groups from Italy, especially those from Quaglio’s home, said yet again with admiration how the artist’s work has been wonderfully preserved. We are aware how much more difficult the work of the restorer must have been if it was to be carried out as thoroughly as the original [...]. Now it was impossible to cover the whole surface of fresh plaster with one stroke of a brush, instead each fragment of the paint that had fallen off, every grain of the dislodged sand or lime binder (as an example here we can mention the frescoes in the presbytery, where new tiny lighter dots are showing for this reason), for each smallest bit of damage a suitable paint had to be found

*and applied in such a way that it did not cover the original [...].*⁷⁵ Kimovec in his letter emphasised one of the most problematic kinds of damage to the colour layer, the “*dotted peeling*”, i.e. the colour layer that is flaking in a dotted fashion, which is still noticeable today. He himself concluded that in the resolution of this kind of damage extensive retouching or overpainting of large surfaces was not possible in order to return it to a unified appearance. Unfortunately we do not know how this restoration was carried out. Due to the lack of data we have also tried to obtain information using oral sources, i.e. people who in any way remembered the

⁷⁵ The draft letter is without an addressee or a date, but by the content it seems to have been directed at Železnik during the years after the restoration (1961–65); signed: F. Kimovec, J. Šimenc, V. Snoj, others illegible: NŠAL, ŽA, Ljubljana – sv. Nikolaj, fasc. 19, cathedral – bills.



restoration,⁷⁶ and then on the basis of the new information we looked for evidence supporting these testimonies. One of the key reasons for there not being any documentation in the archives is probably the fact that we are talking about politically very difficult times, when financial expenses incurred by the diocese with restorations were considered problematic, which is why it is impossible to find estimates, letters, applications, bills, reports and other documents as the work was carried out unofficially.⁷⁷ In addition to Nace Šumi⁷⁸ the conservator Ksenija Rozman was also active between 1959



⁷⁶ The record with a list of and comments by all the interviewees: ZVKDS RC archive.

⁷⁷ In the opinion of the then conservators Šumi and Rozman.

⁷⁸ I wish to thank Professor Dr. Nace Šumi and his wife Jadranka for their exceptionally generous help, a warm welcome in their home, support and key information that directed us to the right people and sent us in the right research direction; Dobeno 2004.



Figures 11b, 11c, 11d show the restored nave vault painting after Železnik's restoration in 1959/60; photographer and date unknown. **11b:** On the scene *Plundering Valuables from the Temple in Myra* there is no noticeable damage caused by damp (e.g. the head of the virtue *Bonitas*; **11c:** or darkened cracks and dirt, this also applies to photograph **11d**, where on the south-western section of the scene on 11b, we see a part of the southern blind window with the already whitewashed decorative painting (right).

and 1962.⁷⁹ They both remembered the scaffolding in the cathedral's interior and even an expert examination of the restoration work together with Mirko Šubic on a platform below the dome. The restoration is thought to have been entrusted to Železnik, who had proven himself through well-executed previous restorations.⁸⁰

A new research impetus was provided by the draft letter found in the cathedral parish from the archbishop to the Institute for the Protection of Monuments, dated 1968, which refers to the rearrangement of the altar space. The second paragraph says: "The restoration of the Ljubljana Cathedral commenced a few years ago. The frescoes on the ceiling and in the dome were restored."⁸¹ In the end, a lucky coincidence⁸² led us to the exact date of the restoration.

⁷⁹ When Rozman was between 1959 and 1962 Šumi's assistant at the Institute for the Restoration of Old Ljubljana, she drew up official documentation on the restorations, which I have as yet not found.

⁸⁰ In the opinion of the former conservators Dr. Ksenija Rozman, Majda Freljih Ribič and the restorer Tomaž Kvas, who remembers the nave and the area under the dome being scaffolded over in their entirety. The restoration is also remembered by the priests Franc Vrhunc and Ivan Merlak. I wish to thank all of them for their help.

⁸¹ The unsigned archiepiscopal letter to the Institute for the Protection of Cultural Monuments, dated 1968: *Gospodarske knjige*, the parish archive in Ljubljana cathedral parish. We wish to thank Dr. France Suštar and Blaž Škerl for their kind help.

⁸² Dr. Ksenija Rozman deserves our thanks for her crucial information and for directing us to Jurij Železnik.

Jurij Železnik,⁸³ the grandson of the restorer and decorator Peter Železnik and the son of the art historian and conservator Milan Železnik, gave us some key information from the material left to him by his grandfather, which confirms that a restoration really had been carried out. One of the crucial documents contains a list of the locations where Peter Železnik had performed restoration work. On his seventieth birthday on 23 February 1972 he wrote in his own hand a list of these locations from 1927 to 1968, which include 5,150 m² of restored wall paintings. This list includes the following: 1959-1960-1961: *Ljubljana Cathedral, everything above the main wall garland, including the dome – 1050 m²*.⁸⁴ On an earlier typed list, he wrote that: “Between 1927 and 1953 approximately 50 bigger restoration and decoration jobs were carried out”.⁸⁵ Here he described the methods he had used and specific problems, his experiences and the assessments, reports and evaluations of his work by the then recognised experts.⁸⁶ Jurij Železnik reported that in addition to the meticulous written documentation his grandfather also used to photograph his work in different phases, but we have as yet not been able to identify his photographs in the photographic documentation found so far⁸⁷ (figures 10b, 10c, 10d). Peter Železnik was born in Zagorje ob Savi in 1902 and died in Ljubljana in 1974. By education he was a decorative painter, but he also made theatre sets, did gilding⁸⁸ and restoration work, and signed himself in documents as a church painter. He is thought to have worked for Jebrač in as an apprentice during 1918 and 1919, whilst in 1922 he completed his training as a decorator. Sometime between 1922 and 1924 he also completed the painting school *Probuda* in Ljubljana.⁸⁹ He learnt how to copy frescoes from

⁸³ I wish to offer thanks to the architect Jurij Železnik for his valuable help and advice and for making the material available to us.

⁸⁴ The hand-written list, Ljubljana, 23 February 1972; the legacy of Peter Železnik (family archive of Jurij Železnik).

⁸⁵ The typed, supplemented list of locations, Ljubljana, 20 April 1956; the legacy of Peter Železnik (family archive of Jurij Železnik).

⁸⁶ Stele, Mesesnel, Šijanec, Cevc, Zadnikar, Kimovec, Komelj, Velepčič in: *ZUZ, Kroniki slovenskih mest, VS* and daily newspapers: the second list of locations Ljubljana 20 April 1956; the legacy of Peter Železnik (family archive of Jurij Železnik).

⁸⁷ We found a number of undated photographs by an unknown photographer, which could be Peter Železnik's in the following photolibraries: Historical Archives of Ljubljana and the IPCHS, Ljubljana Regional Office. We found out from testimonies that there were photographs taken from the actual scaffolding, which may be found during any future research into Železnik's legacy. See documents containing expert opinions on the quality and appearance of the found photographs: ZVKDS RC archive.

⁸⁸ Jurij Železnik stated that he had also restored, for example, the Ljubljana Drama theatre – the gilding of the decorative elements above the stage.

⁸⁹ Local artists in the middle of the 19th century trained in Langus's workshop and the schools belonging to Jakopič and Sternens (after Sternens's departure, it became The Rihard Jakopič Drawing and Painting School), in the art school belonging to the society *Probuda*, Gorše's school and at art academies in neighbouring countries until the Ljubljana academy was founded in 1945: TAVČAR 2006. PAVLOVEC 1976, p. 371 wrote about the *Probuda* art school, where Mirko Šubic became a teacher in 1923 and where a number of Slovenian painters were trained.

Matej Sternens and using Stele's reference also received some additional training in Graz. He worked under Stele, usually alone, hiring assistants only for less demanding work: cleaning, washing, whitewashing, water supply, transport and the preparation of wood for scaffolding, etc. He obtained well burnt, strained and sufficiently rested lime from a lime-kiln in Moste in Ljubljana, he made turpentine himself, bought pigments in Graz and used his own restoration tools such as brushes, sea sponges and silk paper for cleaning wall paintings. For scaffolding he used home-prepared pine wood. To date, we do not have any data about the restoration of the nave vault, except for oral testimonies. We have found out that for political reasons this restoration was carried out unofficially, at a time of a great conflict between the state and the Church,⁹⁰ whilst the costs were covered by the Church. Peter Železnik was already retired by then and is said to have restored the nave vault for free. He cleaned and stabilised the condition of only the most damaged sections from a simple platform made from pine planks and beams that he moved around as needed. When he was restoring the dome, the whole area was covered with scaffolding and the work was supervised by a commission,⁹¹ which is said to have been overseeing also the restoration of the nave vault at the same time.

RESTORATIONS OF WALL PAINTINGS ON THE EXTERIOR

Quaglio painted scenes on the exterior⁹² of Ljubljana Cathedral during two seasons: in 1703 on the south façade *The Feast of the Annunciation*;⁹³ and in 1704, in rectangular profiled wall frames, on the eastern façade *Angel Announcing the Birth of John the Baptist to St Zachariah* and the northern façade *Baptism in Jordan*.⁹⁴ In the late 19th century the wall paintings were restored, “if we are allowed to talk about frescoes in this way.”⁹⁵ In 1903 Steska wrote that due to weathering damage to the colour layer had occurred (the frescoes were faded), which is why the painter **Janez Wolf** (1825–1884)

⁹⁰ This was a tense period of intimidation and the assassination of Bishop Vovk, when news about restorations and financial details were not recorded, everything was done secretly; only cathedral priest Smerkolj in 1967 began to consistently record all the restoration treatments in the cathedral (e.g. the post-ecumenical council restoration of the presbytery, carried out by the architect Anton Bitenc; 1969-71): *Gospodarske knjige*, the parish archive in Ljubljana cathedral parish.

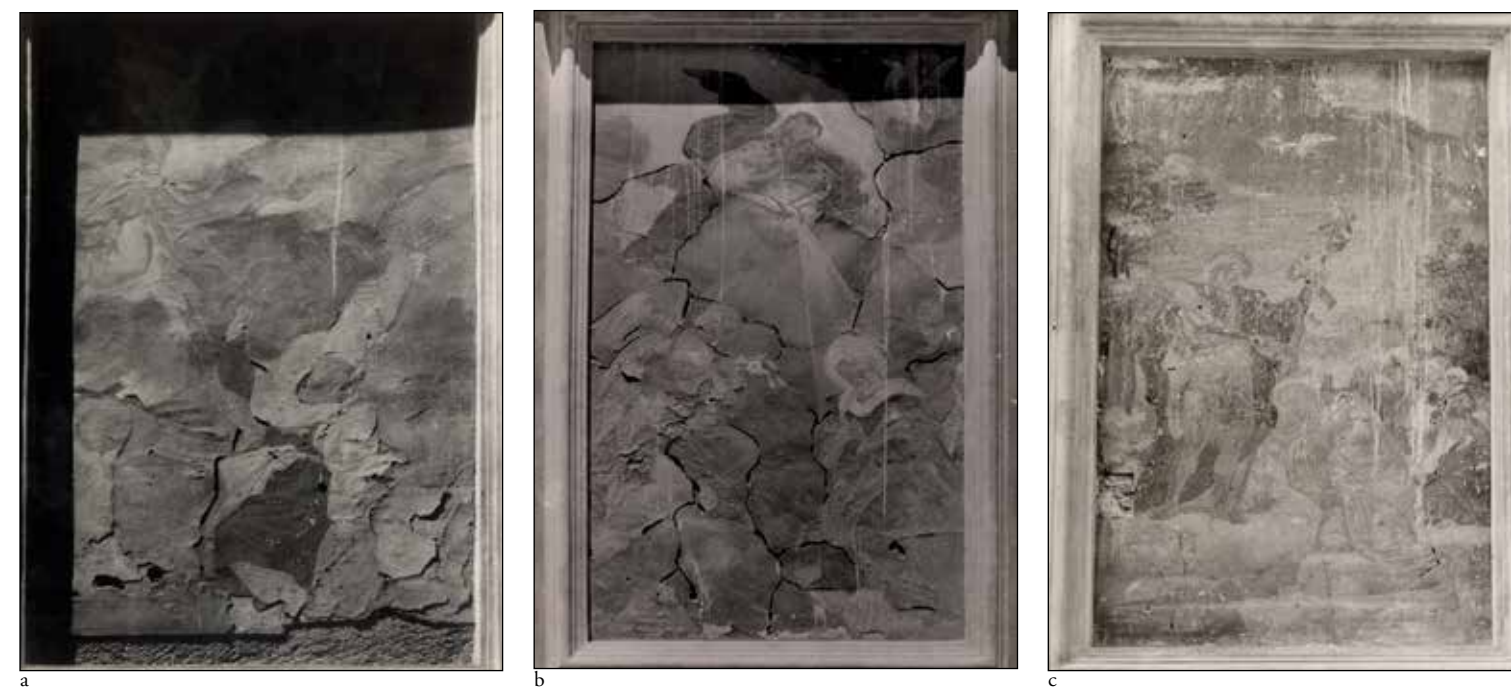
⁹¹ The hitherto known commission members: Šumi, Rozman, Šubic.

⁹² Let us mention other external wall paintings: in 1706 Carloni painted two clock faces on the bell towers, facing the square: DOLNIČAR 2003, p. 309, in 1704 Dolničar took care of the making of a sundial on the sacristy exterior: “[...] it was made by his nephew Aleš Žiga Dolničar [...]” DOLNIČAR 2003, p. 303, but the sundial that is there today is dated 1821: POTOČNIK 1942, p. 3 (cf. LAVRIČ 2007, p. 46). It was renovated in 1989, together with the façade: BENEDEK 1989, p. 357.

⁹³ DOLNIČAR 2003, p. 298 (*Historia*, p. 130).

⁹⁴ DOLNIČAR 2003, p. 302 (*Historia*, p. 135).

⁹⁵ As Steska already said at the time: STESKA 1903, p. 528.



Figures 12a–12c: Probably three of the oldest shots of the wall paintings on the exterior: **12a:** Izidor Molè's photograph of Wolf's scene with St Zachariah prior to being removed in 1964, **12b:** a photograph of Wolf's fresco of *The Feast of the Annunciation*, photographer and date unknown, and **12c:** a photograph of Wolf's fresco *Baptism in Jordan* prior to the restoration, photographer and date unknown.

restored the paintings in 1872⁹⁶ and again around 1880.⁹⁷ After Langus's death, it was Wolf who worked for the cathedral as a painter and restorer.⁹⁸ Smole wrote that he restored the scenes on the southern and northern façades and repainted a fresco on the eastern façade.⁹⁹ *Zgodnja Danica* said that Wolf painted anew “the old erased scenes” of St Zachariah and the Baptism in Jordan,¹⁰⁰ using the fresco technique. The next restoration took place in 1920, when all three of Wolf's technologically poorly executed scenes damaged by weathering, painted on top of Quaglio's destroyed paintings, were restored by the painter **Matej Sternens** (1870–1949), following a suggestion by the cathedral dean Nadrah and the instructions from the Society for Christian Art.¹⁰¹ The instructions and the decision is attested by Stele's official note on 1 June 1920, where he summed up Sternens's report and the restoration plan,¹⁰² adding: “With my agreement, the fol-

⁹⁶ Wolf's restoration (1872) is mentioned by: STESKA 1903, p. 528; *Inventar imovine stolne cerkve sv. Nikolaja v Ljubljani [...]: II. Zunanji okras*: under point 3 it says that all three frescoes were created by Wolf on top of old Quaglio paintings: NŠAL, ŽA, Ljubljana, sv. Nikolaj, fasc. 22, cathedral inventory, in 1951; MOLE 1965, pp. 101–103; SMOLE 1982; BERGAMINI 1994, p. 183.

⁹⁷ STESKA 1903, p. 528. The year 1883 is mentioned by: POTOČNIK 1942, p. 3; LAVRIČ 2007, p. 26.

⁹⁸ LAVRIČ 1996 a, p. 29.

⁹⁹ SMOLE 1982; BERGAMINI 1994, p. 183. Wolf is thought to have been helped by Simon Ogrin: ZUZ 1922, p. 43.

¹⁰⁰ *Zgodnja Danica*, 1872, p. 250.

¹⁰¹ SMOLE 1973 and 1982; BERGAMINI 1994, p. 183.

¹⁰² The cost was estimated at 7000 crowns without the scaffolding; more on the condition of wall paintings: Sternens's letter to the cathedral deanery, dated 6 May 1920: NŠAL, ŽA, Ljubljana – sv. Nikolaj, fasc. 27/b, documents - various.

lowing decision was taken at the session of the committee of the Society for Christian Art on 31 May 1920: the paintings should be cleaned; the most badly damaged sections should be filled in with tempera of local tones; then the paintings should be left to their fate and the natural progress of time as it is impossible to prevent their destruction.”¹⁰³ From a letter addressed in 1928 to the Ordinary's Office by the mayor we found out that the restoration of the exterior wall paintings was for a long time a very burning issue. The mayor drew attention to the fact that the Office for the Protection of Cultural Monuments in Ljubljana demanded that the repair required their agreement, in particular with regard to the “restoration of the frescoes”. They did not agree with the removal of partially damaged wall paintings, but demanded the restoration of the existing state in agreement with them. The work was carried out by a skilled restoration expert in a true fresco technique, whilst the methods were determined by a representative from the Office, in agreement with Sternens, who, according to the author, was “his expert for these matters.”¹⁰⁴

We found out about the next restoration from an article by Molè,¹⁰⁵ in which he mentions **Železnik's** restoration, probably in 1935. This restoration is also attested by the receipt for the payment that Železnik received in 1935 from

¹⁰³ France Stele, *Uradni zapisek tičoč se restavracije Wolfovih fresk na zunanji steni stolne cerkve v Ljubljani*, k. k. Zentral – Kommission für Denkmalpflege (Krain), Ljubljana, 7 June 1920: MK INDOK Centre, document archive.

¹⁰⁴ Letter *Popravilo stolne cerkve sv. Nikolaja, prošnja za podporo*, Ljubljana, 29 January 1928 (on behalf of the Great Mayor signed by Dr. Andrejka): NŠAL, ŽA, Ljubljana – sv. Nikolaj, fasc. 26, documents - various.

¹⁰⁵ MOLE 1965 a, pp. 101–102.

the cathedral's administration for the cleaning of the frescoes in the presbytery and on the external walls.¹⁰⁶ There is a more detailed description of treatments on the external wall paintings in 1955,¹⁰⁷ when Molè stated that the restoration was taken on by the Institute for the Protection of Cultural Heritage of the National Republic of Slovenia (LRS).¹⁰⁸ From the LRS Institute's records we have established the condition of the wall paintings and the names of the commission members who examined them on 18 July 1955: "Prof. Dr. Fr. Stele, Prof. M. Šubic, Dr. M. Zadnikar, conservator N. Šumi, Dr. E. Cevc".¹⁰⁹ The issues were the same as before. The commission members established that because of Wolf's poor technique and inappropriate materials, as well as the extensive new damage that had occurred because of weathering and unsuccessful restorations, the completely decayed base would have to be replaced with new plaster and restored using the fresco technique and a copy of the cartoon. On the frescoes of *The Feast of the Annunciation* and *John the Baptist* nearly half the painting would have to be restored, whilst the other parts that would be difficult to consolidate and conserve would for the time being remain.¹¹⁰ Molè describes in his article the course of the restorers' work.¹¹¹ From the documentation related to the year 1956 the SRS Institute's decision is clear. In a letter to the Ordinary's Office it says that with regard to the critical condition of the frescoes they would not be restored or conserved *in situ*. But as the intention of the Ordinary's Office was to repaint all the damaged sections with copies of the existing frescoes, the SRS Institute recommended that due to Wolf's importance in the development of Slovenian visual art the best preserved sections should be removed and preserved in fragments.¹¹² From the report on the restoration of the exterior we also found out that it included the consolidation and retouching of the external wall paintings in 1962.¹¹³ Documents from the INDOK Centre, the conservation and restoration contract¹¹⁴ for Wolf's frescoes concluded between the LRS

Institute and the cathedral administration and Molè's article told us that during the restoration of the façade in 1962 **Emil Pohl**, the restorer from the LRS Institute, again tried to repair the badly damaged wall paintings. He removed the *Annunciation* on the southern wall and the *Baptism in Jordan* on the northern wall, restored them and replaced them in their original locations. He restored and conserved the third fresco on the eastern façade *in situ*. The treatment was unsuccessful as the surface was so washed out that it could no longer "perform its decorative function on the renovated façade."¹¹⁵ Finally, the decision was taken to replace the scenes with copies in 1964¹¹⁶ (figures 12a, 12b, 12c). According to the contract concluded between Mica Černigoj, the head of the SRS Institute and the restorer, the academic painter from the SRS Institute **Izidor Molè** (1927–1998), the latter by 15 July 1964 created the copies of all three Wolf's frescoes that had been removed. The copies had to be approved by the commission.¹¹⁷

The next mention is from 1982 when, due to vandalism, the white veil of a liquid with a dairy origin had to be removed from the exterior of the wall paintings.¹¹⁸ Another more decisive treatment occurred in 1991, when the Restoration Centre took on the restoration of the Annunciation fresco. In the conservation report it says that Molè's copy from 1964¹¹⁹ was badly damaged in numerous places as the colour layer had flaked off, the surface was cracked and very dusty. The restorer, academic painter **Rado Zoubek** from the Restoration Centre, under the supervision of the responsible conservators Staša Blažič Gyura and Uroš Lubej, removed the dirt from the wall paintings, consolidated them, covered cracks and other damage with putty and then retouched them.¹²⁰

Quaglio's scenes were thus damaged very early on due to their exposure to the destructive affects of the weather and other factors, then restored and replaced with technological-poorly executed copies. Now the exterior is adorned with copies of the copies of the originals, which are with regard to style quite a different interpretation of Quaglio's scenes from 1703 and 1704, and are still a major conservation-restoration problem and technological challenge.

A new factor in the research of the official restorations of the external scenes is the well-preserved documentation for the period between 1955 and 1964. If in previous chapters

¹⁰⁶ Račun od uprave stolnice sv. Nikolaja v Ljubljani za čiščenje fresk v prezbiteriju in na zunanjih stenah, Ljubljana, 18 June 1935, NSAL, ŽA, Ljubljana sv. Nikolaj, fasc. 19 (cathedral – bills).

¹⁰⁷ MOLÈ 1965 a, pp. 101–102. Molè's photographs of the situation following Železnik's restoration (1 July to 31 August 1955) have been preserved, as well as those taken by Demšar and Vardjan: MK INDOK Centre, photolibrary and document archive.

¹⁰⁸ Hereafter LRS Institute.

¹⁰⁹ Zapisnik o komisijem ogledu Wolfovih fresk na zunanjšini stolnice v Ljubljani, addressed to the Ordinary's Office, 21 July 1955: MK INDOK Centre, document archive and photograph library (hereafter Zapisnik 1955).

¹¹⁰ More on Wolf's poor execution and the condition of the wall paintings: Zapisnik 1955.

¹¹¹ MOLÈ 1965 a, p. 102.

¹¹² Letter: *Wolfove freske na zunanjšini stolnice*, Ljubljana (signed by the head Turnher Edo), 2 July 1956: MK INDOK Centre, document archive.

¹¹³ During probing, an older fresco, perhaps Quaglio's, was detected, wrote Rozman: ROZMAN 1963, p. 126.

¹¹⁴ The Contract between the LRS Institute and the cathedral's administration, dated 23 June 1962 (subject: *Restavriranje in konserviranje Wolfovih fresk* [The Restoration and Conservation of Wolf's Frescoes]): MK INDOK Centre, document archive.

¹¹⁵ MOLÈ 1965 a, p. 102.

¹¹⁶ Smole mentions the year 1961: SMOLE 1982.

¹¹⁷ *Pogodba o kopiranju Wolfovih fresk* (9 May 1964): MK INDOK Centre, document archive. The fragments of the removed scene with Zachariah are thought to be the only ones that are preserved: MOLÈ 1965 a, p. 103. Now we know of the nearly unrecognisable fragments in the warehouse of the Restoration Centre, Ljubljana Cathedral of St Nicholas, inv. no. A 134. The fate of the others is not known.

¹¹⁸ BENEDIK 1982, p. 244. The restoration agreement is attested by: the letter *Obnova poškodovane freske na stolnici* from the Vicar General to the cathedral priest, dated 15 July 1981: the parish archive after 1961, Bishop's Palace.

¹¹⁹ BENEDIK 1991, p. 337.

¹²⁰ Molè's fresco was most badly damaged in three sections: the head and wings of the angel, where a reconstruction was necessary and the group of angels in the top right corner: ZOUBEK 1991.



Figures 13a–13c: Three early shots of the scenes in side chapels; unknown date: **13a**: France Mesesnel's photograph of David with a harp in the chapel of St Trinity, **13b**: France Stele's photograph of the ceiling in the chapel of St Andrew and **13c**: Vidmar's photograph of St Barbara from St Barbara's chapel.

we obtained most of the material from the archiepiscopal and parish archives and literary, private and oral sources, this time it was from written documents, photographs, reports and articles in the heritage protection journal *Varstvo spomenikov* and from the archives of the cultural monument protection service.

THE RESTORATION OF WALL PAINTINGS IN THE CHAPELS

We have already said that the chapels initially had no wall paintings.¹²¹ Quaglio decorated them only with painted frames around the altars, and then together with his son and perhaps some other assistants, he created the wall paintings during his second visit to Ljubljana (1721–1723).¹²² He painted the chapels of St Dismas and of Corpus Christi in the transept between 1704 and 1705. From Quaglio's contract, dated 7 June 1704, we can see that he "agreed to paint inside the frames around the large altar and Dismas's altar [...]"¹²³ and from the contract of 24 November 1704 that a year later he painted the altar in the Corpus Christi chapel, which was supposed to resemble its counterpart in St Dismas's chapel, but using other figures.¹²⁴

Matevž Langus is documented as the first restorer. In 1846 he restored the wall paintings next to the altars in the transept and above the large altar; in 1851 the wall paintings

in the chapels of St George, the Saviour and St Magdalene; and then in 1853 the chapels of St Andrew, St Barbara and the Holy Trinity. His treatment caused the first fundamental alterations in the wall paintings. Lavrič wrote that "To please new tastes [...] the altars of Corpus Christi and St Dismas [...] were widened with classicist curtains and candelabras, including pedestals and two painted ledges at the side."¹²⁵ He removed the caryatids and the standing figures of saints and painted a drapery which was originally supposed to extend from under the ciborium above the top part of the altar and reach only as far as the caryatids.¹²⁶ The second restoration was carried out by **Anton Jebačič** in 1905. We have so far not found any specific information or work reports about his restoration. All we know is what was said by Steska, i.e. that Jebačič during his restoration noticed a wall painting of St Peter and St Magdalene, mentioned by Dolničar,¹²⁷ next to Dismas's altar beneath the painted curtain, and he concluded that the curtain's origin was later, i.e. the work of Langus.¹²⁸

The third restorer **Peter Železnik**, in the list of his work locations for the period between 1944 and 1946, wrote: "Ljubljana, Cathedral, restoration of Quaglio's frescoes in the presbytery and the nave and transept up to the vaults".¹²⁹ His report tells us something about the original and the later overpaintings: "Where there is now a heavy curtain down to the painted mensa and a painted candelabrum, there was originally no curtain, but a saint on each side. At the altar of Corpus

¹²¹ ŽELEZNIK 1948, *Poročilo*; LAVRIČ 1996 a, pp. 28–29; LAVRIČ 2003 a, p. 60; LAVRIČ 2007, p. 82.

¹²² Cf. *Ljubljana cathedral and its wall paintings* in fn. 55 and 56.

¹²³ LAVRIČ 2003 b, p. 466. That the large altar was initially painted on the wall was also said by: KIMOVEC 1944–1954, *Kronika*: the lower part behind the canons' seats is thought to have still been preserved during his time; mentioned already by: LAVRIČ 2003 a, p. 60, fn. 308. The wall painting in the bottom part of the transept is from 1723: LAVRIČ 2008, pp. 188–201 (taken from: STESKA 1904, pp. 143–144), in fn. 64 it says that the temporary wall painting around the ledges and chapels was whitewashed at that time.

¹²⁴ LAVRIČ 2003 b, p. 466; cf. DOSTAL 1912, p. 399; STESKA 1934/35, p. 143. The most recent description of the wall paintings in chapels: LAVRIČ 2007, pp. 60–71, and in the nave pp. 82–96.

¹²⁵ LAVRIČ 1996 a, p. 28 based on older archive sources and literature.

¹²⁶ Lavrič in: LAVRIČ 1996 a, p. 28, and DOLNIČAR 2003, p. 325 in fn. 644.

¹²⁷ More about the original wall paintings next to the altars in the chapels: DOLNIČAR 2003, p. 325 (*Historia*, p. 164).

¹²⁸ STESKA 1924, p. 41; mentioned already by LAVRIČ 1996 a, p. 28, fn. 22.

¹²⁹ The second, supplemented list of locations (1927–1953), Ljubljana, 20 April 1956; Peter Železnik's legacy, Jurij Železnik's family archive.

*Christi, fragments of the fingers can still be seen.*¹³⁰ Cankar also noted that in the chapels of Corpus Christi and St Dismas, due to subsequent alterations, the paintings of St Peter, Magdalene, Simon and Jude had disappeared.¹³¹ Železnik with regard to the condition of the wall paintings in the 1940s said¹³² that the frescoes were technically best executed in the transept and best preserved in Andrew's chapel and on all the chapel columns, whilst due to leaks, inappropriate cleaning and "the restoration forty years ago, parts of the frescoes in the other chapels have suffered the most" (figures 13a, 13b, 13c). During his restoration he realised that during the penultimate cleaning the restorer had washed the frescoes with soapy water and made corrections with oil and clay paints. Due to the use of an organic binder, copious mould had formed, which he then removed together with the wall paintings and restored them again "in the secco a fresco technique to the appropriate measure and in the appropriate manner."¹³³ With regard to the chapels, he said that they had originally been white, covered with quicklime, which had to be removed for the foundation for frescoes. In the four front chapels the background had originally been painted with putti holding the purple drapery, whilst in the last two chapels there were paintings of pedestals and sculptures. Železnik saw the reason for the technically worse executed wall paintings in the fact that the plaster for the frescoes had been applied onto knocked-off dry plaster and insufficient lime had been used.¹³⁴ He also wrote that the wall paintings on all the columns and in Andrew's chapels were well preserved, whilst we have learnt from Stele's notes that the overpainted clouds in this chapel may have been Langus's work.¹³⁵ Stele also mentions the drapery extending from below the ciborium above the painted altar tops in the chapels of St Dismas and Corpus Christi, which were supposedly Quaglio's and ended at the sides of the angels and caryatids. In the next section down there is Langus's drapery, which replaced the originally painted standing figures of saints at the sides, which were according to Stele cut out of the wall up to the purple pilaster and the painted mensa, as in some places the wall paintings beyond this point have been preserved. Stele also mentions the figures that had been overpainted in places and were covered by heavy mould and dust, and that the red in the cheeks had oxidised into a dark grey, a problem we are very familiar with from the wall paintings in the nave vault. Stele said about the restoration: "It should be well washed, the wall paintings removed, the missing parts retouched. The frames should keep their original supplemental paint."¹³⁶

¹³⁰ ŽELEZNIK 1948, *Poročilo*; already published by: LAVRIČ 1996 a, p. 28, based on Stele's field notes, France Stele Institute of Art History of the Scientific Research Centre of the Slovenian Academy of Sciences and Arts.

¹³¹ CANKAR 1920, p. 244–245.

¹³² ŽELEZNIK, 25 June 1944, *Proračun*.

¹³³ ŽELEZNIK 1948, *Poročilo*.

¹³⁴ ŽELEZNIK 1948, *Poročilo*; published already by LAVRIČ 2003 a, p. 60 (fn. 308).

¹³⁵ LAVRIČ 1996 a, p. 29 (fn. 25).

¹³⁶ France Stele, VIIA, 14 August 1945, pp. 35–36, France Stele Institute

of Art History of the Scientific Research Centre of the Slovenian Academy of Sciences and Arts.

There are a few key documents on the condition and restoration of wall paintings in the chapels from the second half of the 20th century onwards in the Historical Archives of Ljubljana, the Bishop's Palace, the cathedral parish and in the private archive belonging to Tomaž Kvas. In a letter sent by the cathedral priest to the Ljubljana Regional Institute it says with regard to 1987 that the altar and wall paintings were being restored by the academic painter **Tomaž Kvas** and that a restoration of the wall paintings in the side chapels and the nave was planned.¹³⁷ We can see from the preserved estimates, invoices and reports when and how the work was done. Luckily Kvas, the fourth restorer, just like Železnik, made notes about the wall paintings and the restoration. When restoring in the chapel of St Dismas, he drew up the first, most extensive report.¹³⁸ He mentioned the problem of the darkened paint layer due to dust deposits on the rough painted surfaces, the effects of the polluted external air, the damage due to damp in the lower section before central heating was installed, the crumbling of the colour layer, etc. He drew an important conclusion that matches what we believe today (as the consequence of the 2002–2006 restoration): "All the typified pink-coloured parts of faces such as the cheeks and ears have darkened, as well as the knuckles on fingers, whilst lips have invariably become black, which gives a special mark to the master who created the frescoes in the Ljubljana Cathedral, arousing curiosity about the reasons for this phenomenon, but without proper analysis, the matter will not progress beyond guesswork and assumptions."¹³⁹ During the cleaning he carefully tested the suitable cleaning methods on the basis of the condition of a wall painting, from dry to wet. He found it a relief that the entire altar was painted in a true fresco technique, whilst he had more difficulty with the images of the church's fathers on side walls. He also mentions something that had been observed by the previous restorers: "On the opposite altar counterpart, the fingers sticking out from under the questionable original plaster giornata tell us that there has most probably been an alteration of the silhouette of the altar background with a red ciborium." With regard to the altar in the chapel of Corpus Christi, he wrote something very similar to his first report, adding: "[...] At the time of the creation of the altar painting other restorations took place, as confirmed by the inscription on the back. In 1830, the original illusionistic Baroque altar, from the edge of the caryatids on bulging pedestals to the side figures, was

of Art History of the Scientific Research Centre of the Slovenian Academy of Sciences and Arts.

¹³⁷ Letter: *Obnova stolnice* by the priest Vinko Vegelj to the Ljubljana Regional Institute for the Protection of Natural and Cultural Heritage, 26 February 1987, sent also to the Ordinary's Office at the Archdiocese and the Restoration Centre: the parish archive after 1961, the Bishop's Palace, Ljubljana. Kvas's invoices are kept in his private archive and in the cathedral parish.

¹³⁸ Tomaž Kvas, *Poročilo o restavriranju slikanega oltarja v prečni ladji, desno ter slik cerkvenih očiakov na stranskih stenah*, Ljubljana, 28 May 1984: Tomaž Kvas's private archive.

¹³⁹ On the back page of the same report we can find the restorer's note with regard to the darkened sections – "whether cinnabar or red lead has been used."

overpainted with drapes and gilded candelabra. Prior to applying the plaster, Quaglio's painting was thoroughly scored for the thin layer of plaster to adhere better. Close up, the new layer is very visible, it is lighter and as the colour layer was considerably worn, I restored it [...]."¹⁴⁰ His working methods and conclusions are, in general, similar to Železnik's. In the description of the restoration of the scenes beneath the dome, he notably comments: "Attempting to preserve the original when there is this type of damage presents us with complex restoration problems that are solvable only by studying Baroque masters."¹⁴¹ He describes¹⁴² the condition of the wall paintings in the nave side chapels prior to the restoration in a similar way as those in the transept: the scenes had been mostly painted with a mixed technique (both fresco and the prevailing secco technique), the intonaco is in places rough and dried out, the colour layer unevenly preserved, hidden under a layer of dirt, it is crumbled, faded, greyed and darkened; he noticed dark oxidation of the colour layer on sections representing flesh, especially on the pink areas: ears, cheeks, lips and in the angles of legs and arms; he noticed darkened retouches on the fillings of cracks; a few shaded parts of the rich draperies and painted stucco work were either beginning to decay or had already fallen off; he also noticed damage due to various restoration treatments. Due to the sensitive colour layer, he cleaned the wall paintings partly with a dry method and on the sections that were more solid also with the wet cleaning technique, after which he strengthened these sections. Because of the porous plaster he had to repeat the retouches and reconstructions a number of times.¹⁴³ Kvas's written and photographic documentation offers the last available information about the restoration of the wall paintings in the cathedral and most likely his are also the last treatments on the wall paintings in the transept (1984–1985 and 1987) and in the nave chapels (1986–1987).

RESTORATIONS OF THE PAINTINGS ON THE WESTERN WALL

Quaglio's wall paintings on the western wall are a proof that the cathedral initially did not have a choir over the main entrance as Andrea Pozzo in his original idea based

¹⁴⁰ Tomaž Kvas, *Poročilo o restavriranju slikanega oltarja v levi prečni ladji Rešnjega telesa, vogalne freske alegorije Moči in grba v plastični kartuši*, Ljubljana, 12 April 1985: Tomaž Kvas's private archive.

¹⁴¹ Tomaž Kvas, *Račun in poročilo restavriranja fresk*, Ljubljana, 23 March 1987, and *Račun za restavriranje posameznih medaljonov in alegorij*, from 16 September – 15 October 1987: *Gospodarske knjige*, the parish archive in Ljubljana cathedral parish.

¹⁴² Tomaž Kvas, *Račun za restavriranje fresk v kapeli S. Andreja*, Ljubljana, 1 July 1986; *Poročilo in račun za restavriranje fresk v kapeli Odrešenika sveta*, Ljubljana, 31 October 1986; *Račun za restavriranje fresk v kapeli S. Magdalene*, Ljubljana, 27 February 1987; *Račun za restavriranje fresk v kapeli S. Barbare*, Ljubljana, 16 June 1987; *Račun za restavriranje fresk v kapeli sv. Jurija*, Ljubljana, 15 September 1987; *Račun za restavriranje fresk v kapeli sv. Trojice*, Ljubljana, 13 November 1987; *Gospodarske knjige*, the parish archive in Ljubljana cathedral parish.

¹⁴³ He executed most of the retouches in the lime technique, adding a little bit of casein for a stronger effect.

on the *Il Gesù* church in Rome most likely did not include one.¹⁴⁴ Lavrič wrote that in addition to what is known as four choirs (i.e. two that are open on four sides) the church was supposed to also have a choir on the western side, but due to financial reasons this never happened.¹⁴⁵ The dean thus instructed Quaglio to paint the western wall with three legends connected with St Nicholas:¹⁴⁶ by the window on the left there is the depiction *St Nicholas appears in front of robbers* and by the window on the right *A vandal beating an image of St Nicholas*, under the window behind the organ there is *St Nicholas is elected Bishop of Myra*, including a portrait of Dean Janez Anton Dolničar.¹⁴⁷ Work on the big choir did not begin until 1718.¹⁴⁸ In 1733, Janez Francišek Janeček installed the first organ with three lavishly decorated organ cases, which have been preserved to a varying degree to this day. In 1762 the organist Francišek Ksaver Krizman installed a new organ, but due to the bad condition it was in it needed to be repaired as early as in 1781, following a design of the Ljubljana organist Janez Jurij Eisl. The work was carried out by his successor Josip Alojz Kučera. This organ was, with frequent restoration treatments, preserved for nearly 130 years.¹⁴⁹ Janez Kunat repaired it in 1830, whilst during the general restorations between 1859 and 1860 master Ferdinand Malahovski added 10 stops to it.¹⁵⁰ In 1867 Franc Goršič added new bellows. Ivan Milavec installed a completely new organ in 1911 and 1912.¹⁵¹ It is most likely that Quaglio's wall painting on the western wall was badly damaged during the building of the choir in 1718 and after the numerous restorations of the organ and was therefore whitewashed.

In the 1895 earthquake only the western façade of the otherwise solid and well built church¹⁵² was badly damaged,

¹⁴⁴ *Peto izvestje*, 1913, p. 17; ŠUMI 1961, p. 14; LAVRIČ 2003 b, p. 481, fn. 265. Pozzo, following the Venetian example envisaged two side choirs ("cori spezzati"). Dolničar reported that at the consecration in 1707 the cathedral had two choirs, after 1707 the first organ from the old Gothic cathedral was installed in the left choir: ŠKULJ, DOLENC 1985, p. 24.

¹⁴⁵ LAVRIČ 2003 b, p. 476.

¹⁴⁶ LAVRIČ 2003 b, p. 476 (based on *Accepta et exposita*).

¹⁴⁷ "On the western wall, Quaglio interpreted rather freely the motif and, so it seems, included in it the persons who had merit for the new cathedral", wrote Lavrič, who among the six figures recognised Dean Anton Dolničar, Provost Janez Krstnik Prešeren, and Bishop Ferdinand Kuenburg: LAVRIČ 2003 a, p. 60.

¹⁴⁸ ŠKULJ, DOLENC 1985, p. 170; ŠKULJ 1989, p. 23; LAVRIČ 2003 b, p. 481.

¹⁴⁹ I wish to thank Dr. Ana Lavrič for pointing out that the original colour of the organ cases was grey or beige, which is more in harmony with the frescoes.

¹⁵⁰ The main organ with 32 stops was repaired; cf. ŠKULJ 1989, pp. 79–80; SMOLE 1982.

¹⁵¹ Details about the organ masters based on: ŠKULJ, DOLENC 1985, p. 170; ŠKULJ 1989, pp. 23–95. During the restoration in 1911, all three old organ cases were preserved – they were cleaned and the ornamentation newly gilded: STESKA 1924, p. 41; cf. *Inventar imovine stolne cerkve sv. Nikolaja v Ljubljani [...] (IV. Cerkevna oprava)* in 1951: NŠAL, ŽA, Ljubljana, sv. Nikolaj – stolnica, fasc. 22.

¹⁵² The findings of architectural, construction and static investigations (2002–2006), ZVKDS RC archive.



Figure 14a: The damage on the western wall was caused by the 1895 earthquake and by the restorations of the western gable and the organ. Jebračič's reconstruction of Nicholas's head can be seen on France Stele's photograph of the organ from 1952.

which is why the upper section was rebuilt in 1896.¹⁵³ The Ljubljana builder Franc Faleschini, using plans created by the architect Rajmund Jeblinger, during the post-earthquake restorations built a new triangular gable between the bell towers (figure 2c).¹⁵⁴ The historical western top section was during the restorations in 1989 again replaced with a re-

construction of the original Baroque semi-circular segmented structure (figure 2e),¹⁵⁵ which can be seen in the original version on one of the oldest published reproductions from 1891 in the magazine *Dom in svet* (figure 2b).¹⁵⁶ Undoubtedly the wall painting on the western wall also suffered damage

¹⁵³ Post earthquake restoration of the cathedral, which among all the Ljubljana churches suffered least damage. A new upper section of the façade was built (1895) and the eastern façade was newly plastered (1896): *Zgodnja Danica*, 1896, p. 207.

¹⁵⁴ LAVRIČ 2007, p. 34.

¹⁵⁵ BENEDIK 1989, p. 353; documentation on the restoration (drawn up by: the architect Franc Vardjan from the Restoration Centre) *Stolnica sv. Nikolaja v Ljubljani. Ocena nujnih restavratorskih del na čelni fasadi*, RC SRS, Ljubljana 1988; VARDJAN, RIBNIKAR 1988; VARDJAN 1989, pp. 5–12.

¹⁵⁶ *Ljubljanska stolnica in škofijska palača, Dom in svet*, no. 1, 4, Ljubljana 1891, pp. 40–41.



Figure 14b: A comparison of the condition of the western scene on the right in a detail: **14b left** from Šumi's photograph from 1952 to the condition in 1981 prior to the last treatment: **14b middle** and after it in 2006: **14b right**.



In a detail: **14c** from Šumi's photograph of the organ from 1952 the still unrestored western wall painting is visible; while a detail: **14d** from the shot from an unknown photographer and date, shows the restored condition, with the whitewashed blind window, probably after the 1959/60 restoration.



Figure 14e: The first colour photograph of the third scene of *St Nicholas is Elected Bishop of Myra* on the western wall, in 2004.

during the earthquake. During the restorations marking the two hundredth anniversary of the consecration of the cathedral, whilst the organ case was being repaired, **Anton Jebačič**¹⁵⁷ under the whitewash discovered two wall paintings on the western wall above the organ.¹⁵⁸ The one on the north side was very damaged as there was a hole where Nicholas's head used to be, most likely caused "by a beam that was pushed through the wall during the restoration work".¹⁵⁹ This damage could be the reason why the frescoes were white-washed as, Steska believes, they did not dare repair them. We can thus assume that Jebačič restored the two frescoes and reconstructed the original head of St Nicholas¹⁶⁰ (figures 14a, 14b, 14c, 14d). Steska noted that all Quaglio's scenes could be seen except the third one: *St Nicholas is elected the Bishop of Myra*, which is hidden behind the middle organ case above the door. From the fifth report of the Society for Christian Art we can ascertain that the latter scene was discovered in 1911 during the restoration of the organ and photographed for the first time.¹⁶¹ On 28 September 2004, the scene was again open for viewing due to the opened middle organ case (figure 14e). On this occasion the part

¹⁵⁷ It is believed that in the sacristy he painted during this time angels in round fields with inscription ribbons and the requisites used during a mass, thus depicting appropriate preparation for a mass: LAVRIČ 2007, p. 26 and 96–97.

¹⁵⁸ *Četrto izvestje*, 1907, pp. 12–13; STESKA 1924, p. 40; LAVRIČ 2003 a, p. 59.

¹⁵⁹ STESKA 1924, p. 40.

¹⁶⁰ We assume the saint's face was reconstructed by Anton Jebačič – Darko Tratar is also of this opinion. Perhaps the wall paintings were again restored by Železnik during the 1959–1960 restorations. Judging by the two whitewashed blind windows, the likelihood of this is considerable.

¹⁶¹ *Peto izvestje*, 1913, p. 17; published already by: LAVRIČ 2003 a, p. 60; the first photograph has not yet been found. For the second time the scene was photographed by Dr. Blaž Resman for the publication of an article: LAVRIČ 1996 b, p. 81.

of the fresco displaying the image of Dean Anton Dolničar was cleaned with a sea sponge, soaked in water. We found that the colour layer of the scene containing six full figures, the well painted portrait-like images of the church founders, was considerably damaged. But as the painting had always been hidden behind the organ case, it was protected for a number of centuries from soot, dirt, damp and unsuitable restoration treatments. No protein coat was noticeable in the colour layer, or any darkened pigment on lips and cheeks – two of the typical changes occurring on the nave vault. At the moment, due to the construction of an organ bellow in the middle organ case, the fresco is completely obscured and inaccessible.¹⁶²

The two scenes on the western wall were restored by Darko Tratar with a team from the Restoration Centre of the IPCHS (2002–2006). The worst damage on both the scenes were deep cracks and numerous fillings, probably due to the 1895 earthquake, and a badly damaged extensive surface in the north-eastern corner, at the point where the nave and the bell tower meet, caused by long term leaking.¹⁶³

QUAGLIO'S SELF-PORTRAIT AND THE RESTORATIONS OF THE WALL PAINTINGS IN THE PRESBYTERY

During 1703 and 1704, Quaglio painted four scenes from the legends of St Nicholas on both side walls of the presbytery. On 1 June 1704, using a mirror, he depicted himself on the right edge of the first scene depicting *St Nicholas rescuing the citizens of Myra from hunger* on the right wall.¹⁶⁴ He painted himself as a half-length portrait in three-quarters profile, wearing Baroque attire, seating at a square stone¹⁶⁵ on which he leans with his left arm and on which there is his signature, birthplace and the date of the painting. In his left hand he is holding a roughly spread out roll of paper, hinting at his participation in the planning of the content of the cathedral wall paintings, whilst in his right hand, lying on top of the left, he is holding the attribute of his profession, a handful of painting brushes. Due to various restoration treatments over the last three hundred years his image together with the inscription has changed considerably. From the archived sources and key photographs it was possible to ascertain that at least six restorations of the scene containing Quaglio's self-portrait have been carried out. During the major general restoration project in the 19th century, **Matevž Langus** in 1847 also restored the four legends of St Nicholas

¹⁶² Although there was a lot of dust on the surface, it was not congealed and greasy as in the vault: Mateja Neža Sitar, Zapisnik posvetovalne komisije, 28 September 2004, ZVKDS RC archive.

¹⁶³ See: the work documentation by Dare Tratar, ZVKDS RC archive and the contribution by Rado Zoubek on pp. 206–209.

¹⁶⁴ For 1703, see: DOLNIČAR 2003, p. 298 (*Historia*, p. 130), on pp. 206–209. (*Historia* p. 135/136); for the description of individual scenes, see: *ibid.*, pp. 321–323 (*Historia*, pp. 158–161); LAVRIČ 2007, pp. 54–60. The topic of the consequences of past restoration proceedings on Quaglio's self-portrait was published: SITAR 2008, pp. 86–106.

¹⁶⁵ KOPRIVA 1989, p. 19 wrote that the painter is standing behind a low marble stone.

depicted in the presbytery.¹⁶⁶ The next restoration of the scenes was carried out by **Anton Jebačič** in 1905.¹⁶⁷ The treatments in the presbytery by the third restorer, **Peter Železnik**, are confirmed by bills and three receipts from 1935¹⁶⁸ and by Stele's report stating: "*Quaglio's frescoes in the presbytery were in 1935 cleaned of various overpaintings from the post-war period by Peter Železnik.*" With regard to the condition of the paintings, he found even then "*that the damaged sections have been roughly overpainted and the condition is partly hopeless. By carefully filling in the missing sections, a satisfactory result was achieved so that the paintings, albeit damaged and patched up when looking at details, as a whole show the very lively original character.*"¹⁶⁹ The fourth restoration in the presbytery was again carried out by Železnik within an extensive restoration between 1944 and 1948,¹⁷⁰ when he said in his report, that in 1946 and 1947 he had cleaned and restored the choir walls.¹⁷¹ Like all the other restorations, this one was also subject to criticism. Here is part of the letter addressed by Dostal on 8 December 1944 to the Ordinary's Office: "[...] *Let me mention that with yet another non-expertly performed cleaning of Quaglio's frescoes much has been damaged. One only has to look at the fresco around the painting of St Dismas to see how much power and plasticity it has lost during the last cleaning attempt, particularly in the two angel telamons. In the presbytery, where a few years ago they again washed the frescoes, whole sections are dying, for example on the painting of the scene of the condemned, St Nicholas has nearly disappeared. It is a shame that our cathedral now has such a rash head of administration, who will without any piety towards the past, continue the "cleansing", enjoying complete freedom and even the approval of some individuals to the detriment of the church.*"¹⁷² Dostal is most likely talking about Železnik's restorations in the presbytery in 1935. It seems that the wall paintings were in very bad condition or "aesthetically unsuitable" so that in 1946/47 they had to be restored yet again. With regard to the period after this, due to the lack of official documentation, we had to use alternative research methods – oral accounts,¹⁷³ as at first the only tangible proof was a post-

¹⁶⁶ LAVRIČ 1996 a, pp. 28–29.

¹⁶⁷ From June to 16 December 1905, he cleaned the frescoes in the presbytery, the transept and below the dome: STESKA 1924, p. 39.

¹⁶⁸ Peter Železnik's bills for 19 April, 25 May and 18 June 1935: NŠAL, ŽA, Ljubljana – sv. Nikolaj, fasc. 19, (cathedral – bills) and three receipts for 1935: NŠAL, ŽA, Ljubljana – sv. Nikolaj, fasc. 27, documents: cathedral – various.

¹⁶⁹ STELE 1938, VS, p. 98.

¹⁷⁰ This included the wall paintings next to the main altar and in the side chapels: *Inventar imovine stolne cerkve sv. Nikolaja v Ljubljani [...] (III. Notranji okras)*: NŠAL, ŽA, Ljubljana, sv. Nikolaj – stolnica, fasc. 22, in 1951.

¹⁷¹ And the other five chapels: ŽELEZNIK 1948, *Poročilo*; KIMOVEC 1944–1954, *Kronika*.

¹⁷² Criticism of Dean Kimovec: the letter *Umetnost v ljubljanski stolnici* by the diocesan chancellor Josip Dostal to the Ordinary's Office in Ljubljana, 8 December 1944: NŠAL, ŽA, Ljubljana – sv. Nikolaj, fasc. 26.

¹⁷³ Oral accounts 2005/2006. Thanks to many who have helped us considerably in our research, especially Mr and Mrs Šumi, Mag.

card with a view of the presbytery (1985), in which there is by the southern wall, next to the scene with Quaglio's self-portrait, typical restoration scaffolding.¹⁷⁴ Finally, we managed to find evidence confirming the oral accounts in the archives at the Ordinary's Office at the Archdiocese, the cathedral parish, the Historical Archives of Ljubljana and private photodocumentation.¹⁷⁵ We found that in 1979 the academic painter and specialist **Miloš Lavrenčič** began the restoration of the wall paintings in the presbytery that had been planned for some time. On 25 October 1979, the cathedral priest Tone Smerkolj sent a "letter of apology" to the Ljubljana Regional Institute for the Protection of Cultural Monuments (LRZSV)¹⁷⁶ and a note¹⁷⁷ that restoration work was being carried out in the presbytery, about which the institute had not been informed, and without approval from the Slovenian National Institute for the Protection of Cultural Monuments (SRS).¹⁷⁸ The Ljubljana Regional Institute, after immediate inspection, informed the restoration workshop of the National Institute and after another inspection submitted a conclusion that, in their opinion, the frescoes were in comparison to the originals, restored unprofessionally. Hence on 7 November 1979, they ordered the work to be halted.¹⁷⁹ The restoration workshop had sent a negative opinion to the Ljubljana Regional Institute. It said that the treatment had been wrongly set up from the very beginning: "*With regard to the results thus far, we cannot talk about restoration [...] but about a nearly complete renovation. The retouching, which is meant to reintegrate some parts of the colour layer, has gone beyond this into overpainting in the way that does not suit the original technique and way of painting. The overpaintings are pronouncedly flat, hard, covering the original and giving an impression of the fragmentation of the composition.*"¹⁸⁰ On the basis of this opinion, during the

Miha Pirnat Sn., Mag. Tomaž Kvas, Prof. Mag. Ivan Bogovčič, Dr. Ksenija Rozman, Majda Frelih Ribič, Prof. Mag. Franc Kokalj and the late architect Franc Vardjan.

¹⁷⁴ On the back of the postcard (ad 1987/1661–9, the postcard and picture collection of the National University Library in Ljubljana) it says that this is a reproduction, from: ŠKULJ, DOLENC 1985, p. 25; on the reproduction in: FISTER 1986, p. 247, fig. 393 the scaffolding stands next to the eastern and northern wall.

¹⁷⁵ Source: private photolibrary of Dr. Josip Korošec, the restorer Mag. Tomaž Kvas, and the photographer Marjan Smerke (photo: Smerke, Kvas). I wish to thank all three for their help and for making the documentation available; I would also like to thank the staff of all these institutions, especially of the Documentation Department and the Library of the Restoration Centre, who helped us search and copy the material.

¹⁷⁶ Hereafter Ljubljana Regional Institute (LRZSV).

¹⁷⁷ More in: SITAR 2004–2006 a based on the letter by the cathedral priest Tone Smerkolj to the Ljubljana Regional Institute on 25 October 1979: SI ZAL LJU 583, Skupščina mesta Ljubljana, Komisija za odnose z verskimi skupnostmi, a. e. 33.

¹⁷⁸ Hereafter National Institute.

¹⁷⁹ The letter *Ustavitev nadaljnjih restavratskih del* from the Ljubljana Regional Institute to the cathedral priest Tone Smerkolj on 7 November 1979, signed by Director Aleksander Bassin: SI ZAL LJU 583, Skupščina mesta Ljubljana, Komisija za odnose z verskimi skupnostmi, a. e. 33.

¹⁸⁰ The letter: *Ogled stenske poslikave v prezbitariji stolnice sv. Nikolaja v Ljubljani* of the National Institute to the Ljubljana Regional



Figures 15a–15f: The consequences of the restorations of Quaglio's self-portrait. 15a: From before 1903, perhaps 1898, from Kotar's series of postcards (detail from figure 5b, p. 57).

15b: From before 1927 (published in *Ilustrirani Slovenec*, 1927, p. 393).

15c: From 1952.

next inspection¹⁸¹ the commission again came to a negative conclusion and decided that the work should be halted until all the proposals in connection with the restoration had been dealt with. On 26 December 1979 the academic painter Miloš Lavrenčič submitted a short written report, in which he described, fact by fact, the course of the restoration and the retouching of the first scene on the right. He described the condition before the treatment by saying that the scene was painted using the *secco* technique (the binder was lime) and that there were the following problems: *peeling, blistering, crumbling*. He described his own work in the paragraph *The urgency of a treatment*: “to consolidate using lime water and clean and retouch using fresco paints”.¹⁸² The commission decided that the work would continue in the Spring, following preliminary research by the national institute's restoration workshop, which should submit the final proposal of subsequent work, “while trying to minimise and repair the damage on the present condition of Quaglio's frescoes that is the result of unprofessional

research' and already implemented restoration work.”¹⁸³ After the unsuccessful restoration was halted, in 1984, following the instructions of the National Institute¹⁸⁴ and with the cooperation, approval and supervision of the Slovenian Restoration Centre (SRS), the Ljubljana Regional Institute (LRZSV) and the commission,¹⁸⁵ the restoration was entrusted to the restorer **Tomaž Kvas**.

From Kvas's reports it is clear that in 1979 Lavrenčič restored two scenes: the first one on the south side, depicting *St Nicholas Rescuing the Citizens of Myra from Hunger*, and the first one on the north side, depicting *St Nicholas Rescuing the Innocent Citizens Condemned to Death*. In 1984, Kvas began with a treatment in the right chapel of the transept, in 1985 in the presbytery and then continued with the wall paintings in the transept, and in the side chapels in the nave (1985–1987). In 1985,¹⁸⁶ he photographically documented the condition of the wall paintings in the presbytery before and after the treatments. As we can see from his reports, the scenes in the presbytery had originally not been painted in the true fresco technique, but onto a thin dry layer of plaster, which is why they had been, even prior to Lavrenčič's inappropriate restoration, damaged and badly preserved, making the restoration even

Institute on 15 November 1979, signed: Bogovčič, Pirnat, Gregorin from the restoration studio: SI ZAL LJU 583, Skupščina mesta Ljubljana, Komisija za odnose z verskimi skupnostmi, a. e. 33.

¹⁸¹ 22 November 1979. For the names of members, see: SITAR 2004–2006 a based on *Poročilo o ustavitvi restavratorskih del v prezbitერიju stolnice sv. Nikolaja v Ljubljani*, 7 February 1980, sent by the Ljubljana Regional Institute to the Religious Communities Commission of the Assembly of Ljubljana Town, signed by Director Aleksander Bassin: SI ZAL LJU 583, Skupščina mesta Ljubljana, Komisija za odnose z verskimi skupnostmi, a. e. 33 (hereafter LRZSV, *Poročilo* 1980).

¹⁸² Miloš Lavrenčič's manuscript: *Restavriranje in retuširanje fresk v stolni cerkvi sv. Nikolaja v Ljubljani*, 26 December 1979: SI ZAL LJU 583, Skupščina mesta Ljubljana, Komisija za odnose z verskimi skupnostmi, a. e. 33.

¹⁸³ LRZSV, *Poročilo* 1980.

¹⁸⁴ The instructions are clear from the draft letter sent by the cathedral priest to the Ljubljana Regional Institute 71/84, 2 March 1984: *Gospodarske knjige*, the parish archive in Ljubljana cathedral parish.

¹⁸⁵ The letter *Obnova poslikave G. Quaglia v stolnici* from the Ljubljana regional institute to the cathedral Parish office, 15 March 1984, signed by Director Aleksander Bassin: *Gospodarske knjige*, the parish archive in Ljubljana cathedral parish.

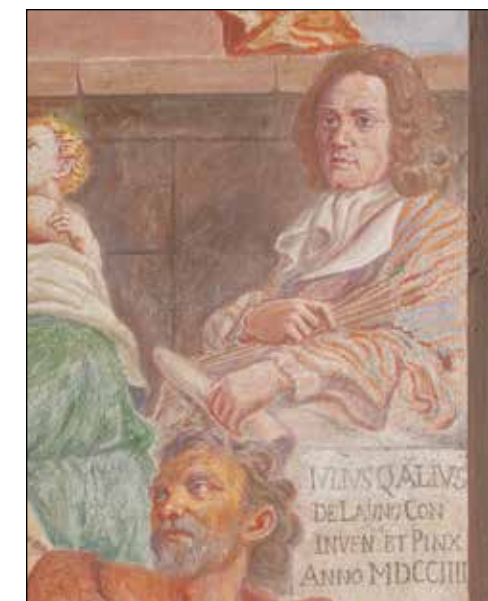
¹⁸⁶ More on the condition and the course of the restoration of the scenes in the presbytery: SITAR 2004–2006 a based on Tomaž Kvas's documents (estimates and bills: *Gospodarske knjige*, the parish archive in Ljubljana cathedral parish).



15d: From 1958.



15e: From 1985.



15f: From 2007.

more difficult. Unfortunately, there is no written documentation about the most problematic first scene on the right with Quaglio's self-portrait, all we have is Kvas's comments from June 1985 on the back of photographs of this scene, where he said that they are “woolly overpaintings by M. Lavrenčič in 1979”. What has been preserved is very illustrative photographic documentation from private photographic archives. Kvas was the last, sixth restorer, who tried to rescue and repair the severe consequences of the unsuitable restoration of the scene containing Quaglio's self-portrait as it has been preserved to this day. What is exceptionally interesting for us is a comparison of the rare photographs found with Quaglio's image from different periods, which most obviously testify about the consequences of the restorations. A comparison of the present featureless “middle-aged man” with the image of the earliest reproduction is quite unbelievable.

The earliest found reproduction containing Quaglio's self-portrait was published in the magazine *Dom in svet*, in which Steska in 1903 in an article about Giulio Quaglio also published the photographs taken by Janez Kotar.¹⁸⁷ In the reproduction of the scene *St Nicholas Rescuing the Citizens of Myra from Hunger* that contains Quaglio's self-portrait we can observe that the painter's image differs considerably from how it is today (figure 15a). The face is of a younger man with well-painted wavy hair. His eyes are seriously and thoughtfully looking at the observer. A narrow strip of the

collar, fastened high under the chin, can clearly be seen as can the lower dark garment and the *jabot* at the front. The stripy painter's smock is fitted to the body and gives the impression of plasticity. Although we are observing a black and white reproduction, we can see that the impression of solidity and directness was achieved by means of a convincing use of light and colour as shown by the flesh colour of the face and the palm of his hand, the lavish hairstyle, the brushes, etc. The degree of Quaglio's mastery and artistic ability can clearly be seen in the young man's eyes, which with a virtuoso precision reveal the character of the depicted person, as well as in the stripy pattern and the refined shadowing of the folds in his smock. The partially open part of the folded paper clearly shows a sketch of a woman's head and shoulder portrait with a hinted background. Below the self-portrait there is the still correctly written inscription.¹⁸⁸ From the reproduction of Kotar's photograph from 1903, we can read: “IVLIVS QVALEVS / DE LAINO COMENSI / INVENIT ET PINXIT (PINXIT?) / ANNO MDCCIII”,¹⁸⁹ translated by Kopriva as: “Giulio Quaglio from Laino near Como¹⁹⁰ invented and painted in 1704.”

The next similar reproduction of Quaglio's self-portrait was published in *Ilustrirani Slovenec* on 27 November 1927 (figure 15b).¹⁹¹ The good quality oval shaped reproduction of

¹⁸⁸ We assume that Steska made a mistake in the surname in the inscription as Quaglio had always signed himself as QVALEVS, not QVALAEVS (also assumed by: BERGAMINI 1994, p. 180): STESKA 1903, p. 489.

¹⁸⁹ In the reproduction from 1952 we can see that initially it had said COMEN, but due to the poor quality of the reproductions the -EN is badly visible and later, due to restorations, it disappeared altogether.

¹⁹⁰ KOPRIVA 1989, p. 19.

¹⁹¹ *Ilustrirani Slovenec*, 3, 27 November 1927, no. 270 (no. 48), p. 393; photograph: Valentin Benedik.

¹⁸⁷ STESKA 1903, p. 488. He published the reproduction of all three scenes in the presbytery depicting the legends about St Nicholas (pp. 489, 529), a view of the inside towards the east (p. 486; the photograph is kept at NSAL, with the inscription 1898, when Kotar is thought to have produced a series of new postcards showing interesting Ljubljana buildings, especially churches (*Slovenski narod*, 1898, p. 3) and the ceiling of the Seminary Library in Ljubljana: NSAL, ŽA, Stolnica, fasc. 14.

the painter's head and shoulders gives the impression of being slightly enhanced: perhaps the photograph was retouched for the publication. We can still observe the characteristics mentioned above: the plastic shaping of the drapery, the neckerchief, the hairstyle and the same facial features as on Kotar's photograph. The signature and date are not visible.

Two photographs from 1952 and 1958 discovered in the photograph library of the INDOK Centre are also an important find. The reproduction of the photograph from 1952 (figure 15c)¹⁹² shows the still young man known from Kotar's reproduction, who has lost his severe and thoughtful look. We can again say that his face and hair have been slightly altered, but still resemble the reproduction from 1927. Slight changes can be seen in the shaping of the eyebrows and the eyes, which are more elongated, in the slightly altered line of the still full lips, in the shading, etc. The inscription under the image is identical to the one from 1903, but the superscripted letters –SI above COMEN^{SI} and –T above PINX:^T here are clearer, as the image is larger.

Another reproduction that is still expressive enough although of worse quality, is from 1967, based on the photograph taken in 1958 (figure 15d),¹⁹³ which already shows an altered image. On the depicted section of the painting, which is larger this time and includes the face of a male allegoric figure below, a child with bread on the left (still a recognisably Quagli-esque type of child's face) and a part of St Nicholas's drapery above, we can observe the badly damaged colour layer. The surface is badly scratched and washed out, the painter's face, especially his hair, the female figure on the rolled paper and the inscription below are, in comparison to Kotar's photograph, less visible. The hair has lost its original fullness, the young man's face no longer possesses the previous gallantry nor the refinement of facial feature and shadow. Perhaps this change was the consequence of a restoration of the wall painting in the late 19th or early 20th century, or the retouching of the photograph. The still young man's nose is less elongated and more blunt, the shape of the eyes and lips is again rounder, and there are some signs of strong retouching there and on the bottom lip, emphasised by shadow.¹⁹⁴ The dark garment with a narrow light-coloured collar is no longer present. All that can be seen is the *jabot* burgeoning out of the smock, which has already lost some of its volume. In individual sections the borders of the outlined edges of the folds can be seen, interpreted either as the consequence of retouching or as a pre-drawing that had become visible due to the destroyed paint layer, the final effect is the loss of plasticity. The inscription is still correct and identical to that from 1903, only less visible.¹⁹⁵

¹⁹² Quaglio's self-portrait, reproduced by Gorjup, 1996, on the basis of a photograph from 1952; the property of Mr Bogataj; MK INDOK Centre, photolibrary. I wish to thank Metka Košir for all her help.

¹⁹³ Quaglio's self-portrait, reproduction from 1967, based on a photograph from 1958; MK INDOK Centre, photolibrary.

¹⁹⁴ That this is not the processing of the photograph, but a pronounced retouching of the cheeks and lips, can be seen when comparing Stele's photograph with Quaglio's self-portrait with an unknown date (neg. no. 12829 S); MK INDOK Centre, photolibrary.

¹⁹⁵ A more precise interpretation of the image is, due to the only pre-

The photograph of Quaglio's portrait from 1985 (figure 15e)¹⁹⁶ certainly shows very unsuitable restoration treatments. It is easy to see what has happened to the painter's originally excellent portrait-like self depiction, executed with Baroque virtuosity. After the negative results produced by all the washing of the painting, the restorer clumsily and unprofessionally tried to save the wall painting. We do not know the condition it was in before he started, but the final result is unsuccessful, stiff, monochromatic retouches that have destroyed the sparkle of life in the eyes, the naturalness of the colour of the skin, the realistic appearance of the body, clothing and of all the attributes. The retouched, literally overpainted sections give the impression of flat coloured surfaces, destroying all the liveliness, three-dimensionality and feeling of movement within the painting, without offering any suitable colour tones, contrasts, shadows, lighter or softer areas. We are looking at a blunt, dead, clumsy, flat, two-dimensional image of a puppet, staring from the wall.

In 1985, the restorer Kvas tried to salvage the scene as much as possible by performing the most urgent treatments and the result is today's portrait (figure 15f).¹⁹⁷ Quaglio's youthful image from the first half of the 20th century is changed into today's older man, no longer depicting a painter at the height of his artistic creativity at thirty-six. In comparison to the previous images this is an impoverished, reduced picture. Due to the dark retouching on the eye balls, the eyes have lost their clear look aimed at the observer, instead what we see is an empty look, directed to the left. The result of the strong, unsuitable retouches covering the original surface, which is badly damaged from multiple mechanical cleaning treatments, is the loss of the voluminousness and plasticity of the original tonal shaping so well executed by Quaglio (the face, the hairstyle and smock, the palms of his hands, etc.). The restoration in 1979 caused the female figure to disappear from the partly unrolled paper and the inscription was also changed to: "IVLIVS QALIVS / DE LAYNO CON / INVEN BT PINX / ANNO MDCCIII". By comparing the reproductions, we can see that three words have changed: QALIVS, CON and BT. Kopriva¹⁹⁸ already noted the possibility that there is a mistake in the writing of QALIVS instead of QVALEVS and, like Bergamini¹⁹⁹ assumed that this was the result of restorations. In addition to Kopriva, Ana Lavrič also drew attention to the change in the word COM into CON, noting also BT instead of ET.²⁰⁰ As the inscription

served medium, i.e. the black and white reproductions of variable quality, complicated and perhaps unreliable.

¹⁹⁶ Photograph Marjan Smerke, June 1985: private photolibrary of Dr. Josip Korošec.

¹⁹⁷ Photograph Valentin Benedik, ZVKDS RC archive. "Today's image" of the artist (photograph Marjan Smerke) was also published by BERGAMINI 1994, p. 12.

¹⁹⁸ Quaglio usually added COM(ensis) to his name – an inhabitant of the place Como; CON is wrongly written in place of COM: says KOPRIVA 1989, p. 19, which we also found when comparing the photographs; due to illegibility, the letter M was wrongly changed into N by the restorer.

¹⁹⁹ Bergamini assumes that these were the results of restoration treatments in the 18th century: BERGAMINI 1994, p. 180.

²⁰⁰ CON instead of COM (ensis) and BT instead of ET, as noted by Lavrič in fn. 537: DOLNIČAR 2003, p. 302.

on the reproduction from 1958 is still correct and as we have finally found photographic evidence, we can only assume that decisive alterations in the inscription and Quaglio's image occurred after 1958, i.e. during Lavrenčič's unofficial restoration in 1979.

What Quaglio's self-portrait originally really looked like is still an unresolved question. Judging by the above-mentioned qualities, i.e. the refined individualised portrait-like appearance of the face that only sufficiently skilled and proficient painters were capable of creating, the naturalness, liveliness and convincing nature of the painted space and images, we can say that it is the portrait shown on Kotar's photograph, published in 1903 that is closest to the original. Portraits included in the depiction of the scene *St Nicholas is elected Bishop of Myra* (figure 14e) located behind the middle organ case on the western wall are a testimony of Quaglio's artistic abilities, which are generally best shown on the kind of portraits where painters do not depict stylised, clichéd faces. The exceptionally simply, naturally, perspectively correct and convincingly drawn portrait of Dean Anton Dolničar, is recognisable and shows comparable similarity to Putti's statue of his bust in the transept.²⁰¹

The different versions of the portrait can thus be described as individual renovators' and restorers' solutions and interpretations (Langus, Jebačina, Železnik, Lavrenčič, Kvas) with varying degrees of success. Any future restoration treatments on Quaglio's self-portrait and the other scenes in the presbytery will undoubtedly be a complex challenge as the question arises of what exactly is the proportion of overpainting, as well as the doubt about just how much of the original colour layer is actually still preserved and not excessively damaged. Based on the hitherto evaluated material from the artist's oeuvre in Slovenia, Italy and Austria, Quaglio's self-portrait in the Ljubljana Cathedral is also the only definite, attested example where the artist, who always signed and dated his work, depicted himself confidently, thus emphasising even further the importance of this commission.

PAINTING ON THE ARCH WALL

During the last restoration project the decorative wall paintings on the wall of the arch (the part facing the nave) were first discovered under the whitewash between 2002 and 2004, and then between 2004 and 2006 were conserved and restored. The wall paintings on the stretch above the profiled edge of the arch were not mentioned in Janez Dolničar's *Historia* among the otherwise very precisely listed scenes by Quaglio in the cathedral. Judging by the style, we can also not ascribe them to Quaglio, so we can only assume they appeared later. Another proof of this are the visible cracks running below the decorative painting from the fresco painting of two apostles, depicted on the extreme

²⁰¹ Supposedly the depictions of other main initiators of the construction: LAVRIČ 2003 a, p. 59, 60 and LAVRIČ 2003 b, p. 450, 494; LAVRIČ 2007, pp. 80–82, and the dean's bust from 1715, made by the sculptor Angelo Putti (presently next to Disma's altar): pp. 121–122.

east, which extends from barrel vault to the arch wall. Plaster must have thus been applied to the cracked surface later and then painted on top.²⁰²

The underlying painting was partly visible through the grey whitewash even before 2002. After removing the whitewash, a considerably damaged colour layer appeared, but we were still able to ascertain that the wall painting was originally painted very well using colour nuancing that gave it volume (figure 16a). It is an interpretation of the theme of intertwined acanthus leaves, with four winged angel heads positioned symmetrically two at each side. In spite of its stylised nature, the decoration has retained its plasticity. The foliage with the winged angel heads was painted in yellow ochre using the secco technique, which made it considerably more difficult to uncover the painting, whilst the grey base is most likely a true fresco.²⁰³ A question arises as to when and why the painting first appeared, who painted it and when it was whitewashed.

The first thing we found in our research was Mesesnel's photograph of the cathedral interior with a view of the arch, on which the decorative painting can clearly be discerned.²⁰⁴ When the photograph was taken is not known, but we can assume that it was during the War.²⁰⁵ On the reproduction of Kotar's photograph of the arch, published in 1903²⁰⁶ (figure 5a), the painting is not visible and on the photograph of roughly the same scene from Archbishop Jeglič's album, dated 1936, we can notice a darker trace, which could be the wall painting.²⁰⁷ The key discovery was Šumi's photographs from 1952, on which the arch wall painting is clearly visible (figure 16e).²⁰⁸ Photographs taken of the arch after that show only a grey layer of whitewash²⁰⁹ (figure 16f).

On the basis of a comparative analysis of the photographs it transpired that the wall painting must have appeared after 1903, most likely during **Jebačin's** restoration in 1906 and was visible until it was whitewashed, most likely by **Železnik**, during the 1959–1960 restoration. We must be aware of the fact that good scaffolding had to be erected in the nave in order to carry out such demanding treat-

²⁰² After talking to the project leader, Mag. Rado Zoubek, to whom I am most grateful for his professional advice during this four-year long project.

²⁰³ In the opinion of the project leader, Mag. Rado Zoubek.

²⁰⁴ A photograph by Dr. France Mesesnel; MK INDOK Centre, photolibrary.

²⁰⁵ He worked in Macedonia from 1928 until 1938, then he was called to Ljubljana in order to fill the position of the head of the Office for the Protection of Cultural Monuments as a conservator, reporting to the provincial authorities. In 1944, he was temporarily moved to Lienz for his own safety due to political persecution, but in spite of this was on 4 May 1945 killed near Turjak: STELE 1951, p. 192. For this hint I wish to thank Metka Košir, Dr. Ferdinand Serbelj and Dr. Matej Klemenčič.

²⁰⁶ STESKA 1903, p. 486. Although due to the bad quality of the photograph we cannot reliably claim this.

²⁰⁷ Photograph no. 65: the album of Archbishop Dr. Anton Bonaventura Jeglič; NŠAL, ŽA, Stolnica, fasc. 67, photographs.

²⁰⁸ A photograph with a view of the eastern interior section: photolibrary, ZVKDS OE Ljubljana archive.

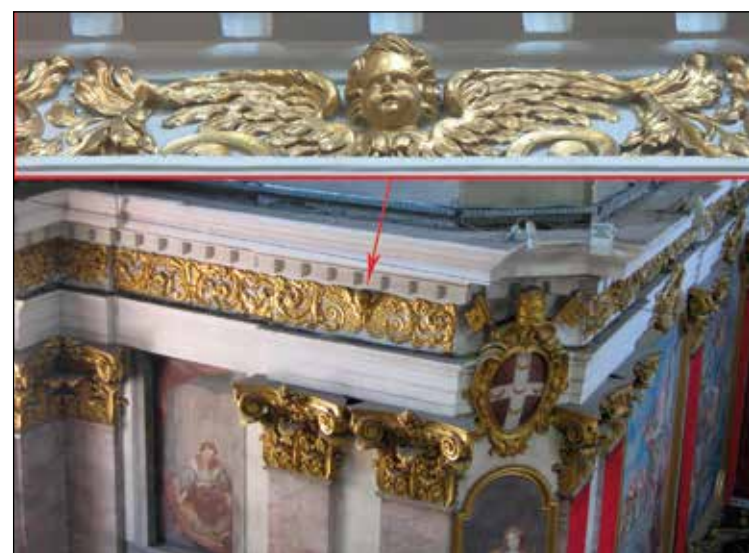
²⁰⁹ See the reproductions in: ŠUMI 1969, fig. 6; SMOLE 1982; *Umjetnost* 1985, p. 12.



Figures 16a–16g: The decorative arch painting - a surprise during the last restoration: **16a** in 2002, prior to the last restoration, during the restoration in 2003 and after it in 2006.



b



c

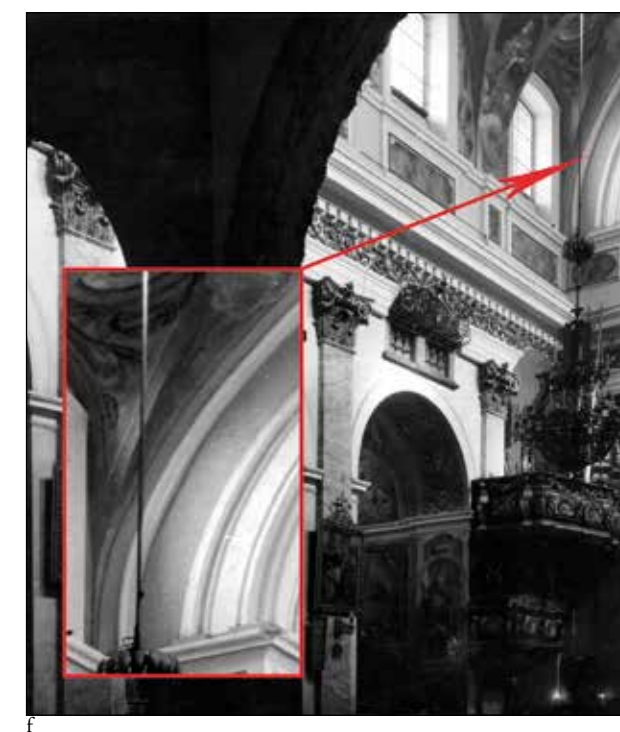


d

16b: A detail from a high quality photograph of the nave vault, photographer and date unknown (figure 7a), was of key importance in the restoration of the arch painting. **16c:** The winged angel head from the gilded stucco freeze under the main wall garland in the cathedral interior. **16d:** Comparisons of decorative patterns: the drawing of the arch painting, the painting now and in the past and the stucco work with the sequence A – a part of the pattern with the angel head and B – without the head.



e



f



g

Figure 16e: Šumi's photograph containing the visible arch painting from 1952. **16f:** The shot of unknown photographer and date with whitewashed arch wall; probably after Železnik's restoration in 1959/60. **16g:** The present day church interior with the arch painting visible once more, 2009.

ments as the restoration of the nave vault or the execution of a wall painting on the arch wall or even for whitewashing. We have not found in any of the documents about cathedral restorations any mention of the painting or whitewashing of the painting on the arch wall. The newly discovered decorative painting that had lost numerous details and artistic finesses is thus recognised as a decoration, which in a refined form copies the gilded stucco work just beneath the main wall garland, which stretches across the whole of the church interior (figure 16c).²¹⁰ In both appears the same motif of acanthus leaves and winged angel heads. The stucco work beneath the main wall garland was created by Tomaso Ferrata²¹¹ as a stucco freeze, originally white on a pink background,²¹² which was gilded only at the end of the major restoration in 1860.²¹³ We can now claim with even more certainty that the painting is a copy of the gilded stucco ornamental freeze (figure 16d) and that it was very well painted since we found an important old black and white photograph, the photographer and date of which are unknown (figure 7a).²¹⁴ On viewing an enlargement of a detail from the edge of the photograph,

²¹⁰ In the stucco freeze under the wall garland the interwoven foliage includes winged angel heads in the presbytery and the transept and flowers in the nave.

²¹¹ DOLNIČAR 2003, p. 293; STESKA 1903, p. 487.

²¹² As stated by: ŽELEZNIK 1948, *Poročilo* or grey as stated by Lavrič on the basis of Zupan's manuscript: LAVRIČ 1996 a, pp. 26–38 based on ZUPAN 1855–1863.

²¹³ More on the gilders: LAVRIČ 1996 a, p. 31.

²¹⁴ Photographic archive of the France Stele Institute of Art History of the Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Ljubljana. Thanks to Dr. Blaž Resman and Alenka Klemenc for their help. We presume with a great degree of likelihood that this is Stele's photograph.

we saw a precisely and very finely painted decorative band (figure 16b). The former decorative, repetitive symmetrical frontal wall painting on the photograph, due to its plasticity, gives the impression of being stucco work. We are assuming that this is the legacy of the typical decoration of church premises in the late 19th and early 20th century.²¹⁵ Showing what has been described as “*neo-Baroque vegetational architectural features*”,²¹⁶ the arch wall painting thus adapted to the character of Quaglio’s wall paintings and the Baroque stucco ornamentation, even surpassing to a certain degree the otherwise typical two-dimensional expression of historical decorative art. The assumed creator Anton Jebačič²¹⁷ is described by Žigon as in general a skilful compiler. She defined him as “*a good ornamentalist, who in the selection of suitable architectural ornaments knew how to accentuate an architectural space with simple decorations which completely and harmonically blend into spaces marked by different styles.*”²¹⁸ Let us mention two examples for a comparison with the Cathedral’s decorative wall paintings. The first is a detail from the arch wall painting in the neo-Romanesque parish church of St Simon and Jude the Apostle in Črnuče from 1901. This first larger work by Jebačič²¹⁹ is stylistically and formally closest to the arch wall painting in the Ljubljana cathedral. Žigon said that the wall painting with Romanesque patterns was of a completely ornamental character, accentuating the architectural elements of the church, giving it a subdued, light and warm atmospheric note. In comparison to the painting in the cathedral, it gives a flatter and more ornamental impression. It is thus clear that the painter in the cathedral adapted his work to the Baroque plastic character of the stucco work, which he copied in the light, warm colour harmony of yellow ochre (imitating the gilding). The second example is a detail from the painting of an ornamental band below the main wall garland in the presbytery of the parish church of St Anthony of the Desert in Železniki from 1891, which is the only wall painting by Ludvik Grilc (1851–1910).²²⁰ In comparison with the cathedral arch wall painting we can in the shape of the vegetation tendrils and leaves recognise a

²¹⁵ I was told about this by Dr. Ana Lavrič and Dr. Damjan Prelovšek even prior to finding the photograph.

²¹⁶ ŽIGON 1982, p. 103. Usually, figural compositions are painted in the true fresco technique and ornamental ones in the secco technique: ŽIGON 1982, p. 10.

²¹⁷ A representative of the Carniolan group of Wolf’s students, who developed their master’s Nazarenism into a historical tendency (ŽIGON 1982, p. 66 and older literature), strongly supported by the Church. The Society for Christian Art used to draw up the plans for church restorations, various opinions and performed supervision (cf. *Četrto izvestje*, 1907, pp. 12–13, and *Peto izvestje*, 1913, p. 17, and five *Izvestja* from 1894–1930). The society actively cooperated with painters: e.g. Dostal together with Jebačič prepared the design of ornamental elements and instructions for the wall paintings in the church in Šmartno near Litija: ŽIGON 1982, pp. 100–102.

²¹⁸ ŽIGON 1982, p. 102.

²¹⁹ ŽIGON 1982, p. 88, fig. 90.

²²⁰ Žigon describes the figural-ornamentative painting as one of the best wall paintings from this period in Slovenia and notes how well incorporated it is into the modern architecture: ŽIGON 1982, p. 91, fig. 98. About Grilc: ŽIGON 1982: pp. 91, 100, 131, fig. 98.

similar artistic interest in the search for Baroque plasticity and naturalness.

In the original Baroque character of the cathedral interior the wall paintings in the nave, the transept and presbytery were interrupted by white caesurae: the main wall garland at the height of 11 metres that runs around the whole of the interior, the semi-circular arches on the eastern and the western wall and in the transept on the northern and southern walls by the large windows, the western stretch of the arch where the nave and the transept meet, the four lower arches at the cross-section of the nave and the transept below the dome, and so on.²²¹ The interior changed considerably as a result of the restoration in the 19th century with the gilding of the ornamentation, capitals and the marbling of walls and columns, coming closer to the tastes of the Austrian Baroque. In subsequent periods, through the addition of new artistic accessories, they probably wished to establish a connection between the two characters. The decorative arch wall painting had thus not been a part of the original artistic concept and appeared as a consequence of a change in the artistic taste of the commissioner. In the search for the synchronicity and aesthetic balance of the interior as a whole and the fashionable tendency for a richer decoration of the white caesurae it probably appeared as a connective field between two levels: the original character – the colourfulness of the wall paintings and the whiteness of the unpainted architectural elements – and the secondary character of the “gilded 19th century”. During the final conservation-restoration presentation we were aware of the fact that a complete reconstruction of the original painting on the basis of a reproduction of the detail on the preserved photograph was not possible. A reconstructed wall painting could encroach considerably into Quaglio’s original artistic idea. At the same time, the decorative painting is an artistic contribution of one of the stylistic periods. The final presentation was, on the basis of studies and consultations in 2006, executed in such a way that it conserved the preserved wall painting, the most impoverished sections with regard to colour and the missing sections were retouched, the contours, shadows and the background were additionally slightly toned to the extent that the intensity and dynamics of the decoration were unified along the whole stretch of the arch wall, so that the final effect is unobtrusive and thus does not in any way disturb Quaglio’s wall paintings or the interior as a whole.

THE PAINTING OF BLIND WINDOWS

The basilica-style illumination of the nave is achieved through six windows above the side chapels, located above

²²¹ The question arises of whether some other examples of “white caesurae” were similarly adorned (cf. the opinion of the responsible conservator Dr. Uroš Lubej, IPCHS, Ljubljana Regional Office: ZVKDS RC archive), but it is a very weak assumption. During the probing of the stretch on the arch of the western wall there were no traces of wall paintings, with the exception of a number of layers of whitewash in different hues of grey on a white base, whilst other sections are not accessible to probing.



Figures 17a and 17b: The blind window in 2002 before the last restoration, in 2003 during it and in 2006 after the restoration, in comparison with the original Baroque window in the room above the cathedral sacristy: 17a and with the blind windows in the Seminary Library in Ljubljana: 17b.

the main wall garland below the lunettes, which cut directly into the barrel vault and the large window in the western wall. The fourth “window” on both the north side and south side of the nave just by the western wall is blind. During the last restoration (2002–2006) the windows were renovated as the non-original glazing was worn and damaged. Originally the basilica-like windows were also Baroque, in a honeycomb pattern; the glass was inserted into lead frames as can still be seen in the only preserved Baroque window in the upper floor of the north sacristy, which was of help to us in the reconstruction of the new glazing, copying the original Baroque style.²²²

The restoration project included the two blind windows typical of the Baroque artistic habit of playing with illusion and tricks, which had been, like all the other undecorated interior surfaces, whitewashed in grey. We removed the whitewash and presented Quaglio’s original fresco,²²³ an illusionistic window with a honeycomb pattern, imitating the original Baroque windows (figure 17a). But on old pho-

tographs we made a discovery that this was not the only decoration of the blind windows. In connection with this, the old painted windows on the southern side, decorated with paintings of winged angel heads and with vegetational and ornamental decoration are of particular interest to us. The windows to the north were noticeably newer than those to the south and were simple, consisting of glass – crown glass windows. All we know about the provenance of the cathedral windows from archive sources is that due to an explosion at the Ljubljana railway station in 1945, the northern windows were badly damaged and between 1947 and 1949 newly glazed.²²⁴ In the parish chronicle for 28 August 1946 Kimovec wrote: “*After waiting for a long time, we today received from Hrastnik (the state glass factory) the glass globes (Butzenscheiben), from which we will put together and mend the broken windows in the cathedral. The previous windows were painted glass (Tyrolean work from Innsbruck) – a rather rough artisan job. It is impossible to replace them with the same. [...] After an agreement with and approval by the cathedral Chapter and the Ordinary’s Office, the administration – following consultation with the architect Professor Vurnik, Professor Dr. Stele, the former conservator Dr. Šijanec, the present conservator and others – decided on colourless*

²²² The window restoration project was led by Matej Zupančič, a senior cons.-rest. from the architectural department, with the help of Mag. Nuška Dolenc Kambič, the senior cons.-rest. from the sculpture department of the IPCHS Restoration Centre, to whom I wish to express gratitude for her expert evaluation and comments (e.g. the glass in the old northern window with a diameter of 17 cm was cast, not blown).

²²³ See the contribution about the conservation-restoration work by the project leader Rado Zoubek.

²²⁴ All the windows in the presbytery and the transept, the big window in the main choir, four smaller windows on the evangelical side: *Inventar imovine stolne cerkve sv. Nikolaja v Ljubljani [...] (I. Splošni opis cerkve)*: NŠAL, ŽA, Ljubljana, sv. Nikolaj – stolnica, fasc. 22, in 1951.

globes. During the Baroque they were often used around Slovenia – or their simple replacement, hexagonal glass mounted in lead. The frames will be made from larch wood. They were drawn by the architect Ogrin. [...] The windows will be made in such a way that they can be opened and cleaned from the inside.”²²⁵ Perhaps this refers also to the painted windows on the south side, which are of special interest to us. On older photographs, i.e. Šumi's from 1952²²⁶ and Stele's,²²⁷ we can on both windows see paintings that most likely copy the pattern from the south windows (figures 17c, 17d). Due to the poor quality of the enlargement of the detail we can only offer a rough description: a painted, framed window (the frame – wooden effect) is divided by one vertical and two horizontal crosspieces (crosspieces – metal effect), and within the individual sections the surface is divided into twelve rectangular units. The rim of the window is painted with a stylised decoration, reminiscent of the décor on the south basilica windows with the same partitioning of the window surface with crosspieces. The wider border stretch of the glass in the south windows is painted with a stylised decoration in the shape of acanthus leaves, twisting lines of stems, leaves and two vases with flowers; attached to the two lower corners are the profiles of art-deco stylised angel heads with curls of long, golden yellow hair and wings, or in the second case, where two angel heads, depicted *en face*, are included in the decoration consisting of a slightly altered combination of acanthus leaves, blossoms and ornamental shapes on the left and right in the middle of the border. The effect of the painting is that of an window border, whereby a stylised pattern of twisting lines runs from one corner to the other, reminiscent of Baroque decoration. With regard to the painting of the blind window we can, at least in connection with the northern one, say that the combination is the one from the stained glass of the basilica windows to the south, in which the winged angel heads are placed *en face* in the middle of the decoration. The question arises as to who painted over Quaglio's blind windows and who then whitewashed them. We can assume that the artist who created the stylised paintings was **Anton Jebačič**, who is also thought to have painted the arch wall; in both cases we are dealing with a decorative addition from the 20th century. It is impossible that this is **Železnik's** work as on photographs taken after 1960 all we can see is greyish whitewash (figure 14d). It is most likely that the decorative wall paintings were whitewashed during **Železnik's** restoration (1959–1960), and during the last restoration we have unknowingly removed it together with the most recent decorative painting, all the way down to the original layer. Now Quaglio's windows again entice the observer's eye; they artistically supplement and spatially widen the real architectural elements. There is a similar example in the Seminary Library, where on two of the walls it was really impossible to create window openings

²²⁵ KIMOVEC 1944–1954, *Kronika*, pp. 49–50.

²²⁶ Photolibrary, ZVKDS OE Ljubljana archive.

²²⁷ No date: Photographic archive of the France Stele Institute of Art History of the Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Ljubljana.



Figure 17c: Comparison of the decorative pattern from the stained glass of the old southern window: **17c left** with the painting of the north blind window from Šumi's photograph dated 1952: **17c right**. **Figure 17d:** Comparison of a detail from the stained glass of the old southern window: **17d left** with a detail: **17d right** from Stele's photograph (figure 14a). The same blind window was most likely whitewashed after 1959/60 (figure 14d).

and thus real windows are perfectly convincingly and efficiently replaced by unreal, painted ones (figure 17b).

FINDINGS AND CONCLUSIONS

When studying restoration treatments in the cathedral we can not avoid the fact that the Baroque church itself appeared as the result of changed artistic taste or as the new aesthetic ideal of the initiators of the construction. In *Historia* in 1701 the “*bad condition of the old Gothic building*” was given as the main reason for its demolition.²²⁸ Only a few objects²²⁹ from the old late Gothic church remained, which Janez Gregor Dolničar protected from destruction. This demonstrates the level of awareness about the importance of the protection of cultural heritage at that time. However, we must consider the historical situation as it was then and the different way of thinking, which is from today's perspective bound to be seen differently. On the one hand, an exceptional late Gothic building in Slovenia had disappeared, but on the other an exceptional Baroque work of art was built in its place. The next significant treatment into the structure of the Baroque building, which satisfied the dean's request but brought with it the first negative consequences for the Baroque wall paintings, was the building of a real dome (1841–1843) as it destroyed, with the exception of three preserved fragments, the whole of Quaglio's illusionistic dome. The other wall paintings experienced a number of restorations, three of which were more extensive and are documented to a varying degree: Langus's (1846–1853) within the framework of the major restoration in the 19th century as a part of the preparation for the four hundredth anniversary of the Ljubljana diocese; Jebačič's (1905–1906) as part of the preparations for the two hundredth anniversary of the Baroque cathedral; and **Železnik's** (1944–1947), which continued from 1959 to 1961 in the lead up to the five hundredth anniversary of the foundation of the Ljubljana diocese and which is seen as the third restoration of the nave vault. We have learned about the less extensive and worse documented, but sometimes even more critical restorations, in relation to individual sections of the wall paintings: on the exterior, in the chapels, on the western wall and in the presbytery. The arch wall painting is a special chapter, as it was a true unknown when first discovered and is not mentioned in the existing sources or literature. By a lucky coincidence we obtained the best possible proof – a photograph testifying to the original appearance and role of this painting before it was whitewashed. Restored and again presented to the public, it helps to shape the current character of the cathedral. The last restoration project (2002–2006) included

²²⁸ DOLNIČAR 2003, p. 222 (*Historia*, pp. 1–2): Lavrič in fn. 27: “*These kind of formulations have to be taken with reservation as in the past they liked to refer to the bad condition of old buildings (even though these were often still sufficiently solid) in order to justify the building of new ones [...]*”

²²⁹ The Gothic pietà, the epitaph of the Petinensis Bishop Martin, the Crucifix in the Chapel of the Holy Cross, the keystone with the head of Christ, tombstones, etc.: SMOLE 1973; SMOLE 1982; LAVRIČ 2007.

the restoration of the main wall garland and the stretch of wall above and below it (with marbled fields, painted in the fresco technique and surrounded by golden frames). For this purpose we compared various archived written notes (by Goldenstein, **Železnik** and Kimovec) and determined the hues in which the architectural elements, the stucco work and other ornamental elements were painted originally and subsequently. On the basis of the results of chemical analyses and historical studies, the final decision was made to mechanically and chemically remove surface dirt, to restore the marbling, to re-gild the gilded frames, to remove the old layers of whitewash from the unpainted surfaces and to freshly whitewash them. The caesurae separating various sections and the unpainted architectural elements remained white in line with the original Baroque artistic concept of the decoration of the interior as they emphasise and frame Quaglio's illusionistic wall paintings.²³⁰

During our research, we followed all wall painting restorations of any sort which had been carried out during the last three hundred years. Every one of the mentioned restorations, large or small, successful or unsuccessful, left traces on the wall paintings. Generally speaking, it is the wall paintings on the nave vault that have been preserved most during the last three hundred years compared to the scenes that were, due to easier access, more exposed to treatments, damage and change, which are therefore in worse condition and more problematic. But a more detailed study of the material condition of the vault paintings revealed quite a number of problems that are tied to the other wall paintings. By comparing different sources, from official documents to various positive or negative comments in the press or in private correspondence, we tried to obtain an objective insight into what had happened and into the background of the restorations. We found that both Jebačič and **Železnik** faced similar problems to those that we were faced with at the beginning of our restoration in 2002: dark, greasy dirt and dust, soot, cobwebs, various types of flaking and the crumbling of the colour layer, changes on the paintings due to natural ageing, damage caused by unsuitable cleaning and the use of inappropriate materials during previous restorations, decaying filler in old cracks, longitudinal cracks on the vault as a consequence of earthquakes and the normal slow subsidence of the barrel vault. During the 2002–2006 restoration, on the basis of chemical studies, we determined other negative changes on and in the layers of paint and plaster: changes caused by chemical processes and additions (for example the darkened red and white²³¹ already encountered in 1903, gypsum in the paint layer caused by unfavourable environment factors²³², damage caused by damp

²³⁰ The white caesurae are especially significant in the nave as they constitute a frame for the illusory perspective tackled by Quaglio more seriously on the vault (and in the present day cathedral in Gorizia as early as in 1702). He painted the space above the real architectural elements as an illusion of a supra-space that is escaping into the sky (still in a decorative manner). In the presbytery and the transept the scenes are still caught within stucco frames.

²³¹ As the consequence of pigment oxidation: ROPRET, 4 June 2003.

²³² Cf. the article *Investigations of colour layers* by Polonca Ropret.



Figure 18a: The painting on a photograph of the nave vault, photographer and date unknown, with visible cracks and dirt gives the impression of not having been restored.

and climatic changes, the darkened consolidation layer on the surface). As an example of damage caused by damp let us mention the following sections: H8, H9 – the head of the first virtue – *Bonitas* on the west side, and H19, H20 – the head of the third virtue *Humilitas* on the east side, on the northern lunettes. During the restoration of the two heads we were helped by one of the most important finds made – a photograph of the nave vault, photographer and time unknown (figure 18a)²³³ – which was of great value during the reconstruction. This exceptionally high quality shot very clearly shows the state of affairs before the two heads were damaged by long-term leaks. When and for how long these areas suffered from damp is difficult to prove. Perhaps the destruction was caused by the leaks written about in the complaint by the cathedral administration against the Ljubljana Town Internal Affairs Commission in connection with the punishment of the cathedral's head administrator Venčeslas Snoj for collecting voluntary contributions that were prohibited in those politically delicate times. Among other things, the following was said of 1950: "Last winter the roof leaked so badly that the vault was soaked through, as it was impossible to obtain the material necessary for repairs."²³⁴ During the 2002-2006 restoration we were able to reconstruct the head of *Bonitas* successfully on the basis of an enlargement of a detail on this photograph (figures 18b, 18c).

Another problematic type of damage already mentioned was a visible roughness, i.e. dots of flaked-off paint that were encountered in previous restorations. The condition of the surface of the paintings was in 2002, prior to our treatments, the consequence of multiple restorations, whereby it was difficult to recognise and define which damage was the result of which restoration. We were helped by chemical analyses and the study of archive sources. It is obvious that even during the major restoration in the 19th century there took place not only significant changes in the character of the cathedral interior, but also the first damage to Quaglio's wall paintings. Goldenstein's letter offers us many possible explanations about the condition of the wall paintings in 1859. Doubt is raised by the mention of the fact that Langus restored all the paintings on the walls, but on the ceiling only the ones in the chapels, thus the nave vault is not directly mentioned among the listed treatments. But if Goldenstein's statement that the vault paintings were cleaned by "servants with scrubbing cloths" is not an exaggeration, these could have been the first very unsuitable treatments. Alongside other reasons (the composition of the plaster, the chemical changes in the plaster and colour layer, the wearing out and ageing of the materials, damp and air pollution), excessive "washing out"

²³³ Photographic archive of the France Stele Institute of Art History of the Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Ljubljana. Perhaps the photograph was taken by Stele, as he published a similar one in: STELE 1938, fig. 37. The oldest photo documentation is represented by Kotar's, Dostal's and Stele's photographs.

²³⁴ The draft of the complaint by the cathedral administration against the rule RLO 1 passed by the Internal Affairs Commission of the Town of Ljubljana about penalisation, (added on 1 July 1950): *Gospodarske knjige*, the parish archive in Ljubljana cathedral parish.



Figures 18b and 18c: In an enlargement of detail 18b from the whole (18a) a trace of long-term damp is visible around the head of the first northern virtue *Bonitas*, which caused destruction: 18c – the condition in 2004.



Figures 18d and 18e: Two photographs of the *Deposition from the Cross* from Puštal: 18d: (unknown photographer and date), prior to restoration, with visible cracks and: 18e after the restoration, the condition in 2005.

of a wall painting can be a significant cause of mechanical damage on the surface, the impoverishment of the colour layer and the intensity of colours. Goldenstein also writes about Quaglio's "artistic finesses" that were lost through cleaning and about "considerable skilfully and lavishly executed retouching" (Quaglio's additional colour layers), which in Goldenstein's opinion gave the "old, uncleaned wall painting" a more subdued appearance. He concluded that the lighter appearance of the wall paintings after the restoration was the consequence of it being "washed out". Furthermore, we found out from the report by the Vienna Central Commission (1905) and that written by Železnik (1948) about

Jebačin's unsuitable working methods ("washing with soapy water"), which makes it easier to explain the lighter paint²³⁵ and colour intensity, so typical of Quaglio's art, for example on the wall paintings in Udine in *Monte di Pietà* (1694), in *Palazzo Antonini* (1697/198) and in *S. Chiara* (1699). In the desire to achieve greater visual effects, stronger contrasts and the more convincing dramatical nature of the scenes portrayed Baroque artists, and Quaglio was no exception here,

²³⁵ With the last applications of paint, visible as woolly traces of the brush, the painter moved away from the basic form of the engraved pre-drawing from the cartoon and used light for shaping: KOLLER 1990, p. 333.



used a typical technique²³⁶ in which the base is painted in the true fresco technique (as attested by the *giornate*), the paint used for shading or lighting in the lime technique and the perfecting of detail in the secco technique. At the

same time, the plasters in the Baroque period had a grainier structure and thus damage more easily during mechanical cleaning. Through various "cleaning" and "washing" processes through the centuries the top applications of ultramarine slowly disappeared as they were not executed in the true fresco technique, which is the most hardwearing and durable. Quaglio's soft "woolly" light on draperies and the lighter parts of flesh that give the wall paintings a lively, contrastive and voluminous plastic effect can also be observed on the *The Deposition from the Cross* on the altar wall of the castle chapel at Puštal near Škofja Loka (figures 18d, 18e), which Quaglio created immediately following the completion

²³⁶ The *mezzo fresco* technique, very popular in the 17th and 18th century (also known as *pittura a calce* or *pittura a bianco di calce*), that was already used in the late 16th century. Pigments were mixed with calcium hydrate and used on dry or wet plaster, which enabled practical new features. Important instructions for painting frescoes can be found in the famous treatise written by Pozzo: *Breve istruzione. Per dipingere a fresco*, in: POZZO 1693-1700; cf. DUDINE, FIORINO, MAREZIA, MARINI, ZAMBON 1999.



Figures 18f and 18g: The nave vault prior to restoration in 1996: 18f and after it in 2007: 18g.

of the paintings in Ljubljana cathedral during his stay there on the way home to Laino (1706).²³⁷ The Puštal wall painting can be interpreted as a sign that the condition of the cathedral wall paintings is more the result of the previous restorations (including the darkened layer of consolidant) that strongly influenced the paintings' visual appearance (i.e. the colours give the impression of dullness and coldness), rather than of a change in the artist's style, as claimed by some researchers.²³⁸ The vault paintings in their current state, following the last restoration, point more in the direction of liveliness of colour and of chromaticism rather than the opposite.

The main reason for the third significant type of damage, i.e. the visual alteration of the colour layer due to which the wall paintings appeared darker and colder, was (in addition to the dirt) the top, brownish layer that was during the last restoration revealed through chemical analysis as a *protein coating containing casein*.²³⁹ Through the years it had darkened so that the overall effect of the nave vault painting was much darker than is typical of Quaglio's Ljubljana colour palette (1703–1706). On the basis of the fact that the coating could not be found in the colour layer cracks that clearly could not have been there at the time of Quaglio's creation of the paintings,²⁴⁰ we presume that this was from today's point of view an unsuitable treatment, with which the restorer wished to consolidate, protect and refresh the colour layer. The coating is most likely the work of Jebačin, as his propensity for using unsuitable methods and materials has been documented (from Železnik's report we learn about his use of clay and oil paints and organic binder), and in 1906 the whole of the nave was scaffolded, which made this kind of work possible. At the same time Železnik's report dates back to 1948, which means he is writing about the condition of the paintings prior to his own restoration. From an oral source we also found out that between 1959 and 1960 Železnik only cleaned the vault paintings.²⁴¹ During the last restoration (2002–2006) the coating was removed by chemical cleaning,²⁴² after which the results were quickly visible (figures 18f, 18g).

Whilst researching past restorations it is important to note, as we said at the beginning, that it was not only the taste of a particular period that changed, or of the commissioners of the restorations who simply wanted something more fashionable, but also the practical aspects of the work,

the way of thinking and the way restoration treatments – both restoration itself and those who carried out the work – were viewed through time. We must take into account that at different periods renovators used different approaches to restoration and had different objectives. As we have observed, work was greatly dependent on the given conditions (professional, social, political and financial, etc.) and the capabilities and skills of each individual restorer (who may not have been suitably trained or experienced for this work; restorers usually learnt their trade in various painting and sculpting or other workshops)²⁴³ and, of course, on the available resources (painting and restoration implements and tools, materials, pigments, lime, and other necessary resources). Restoration was viewed differently then, some people leaned towards preserving the original to the greatest possible extent, some towards adding their own creative ideas, whilst others were simply not up to the job or tackled it only partially or actually caused damage. On the other hand, it was always important who actually made most of the decisions with regard to the restoration, whether this was the commissioner or an expert body with more expertise (e.g. the Vienna Central Commission, the Society for Christian Art, the conservator France Stele or other conservators from the cultural monument protection service), what their competence was and the strength of their arguments, and who determined the limitations and the professional level. In the interpretation and evaluation of the known information from the preserved documentation it is necessary to take into consideration the numerous factors involved in conservation-restoration work in the past, especially in terms of the application of the information, knowledge, experience and negative or positive results today.

From the existing data we were able to determine the intervals of larger restorations. They occurred approximately every forty to fifty years, usually on the occasion of various anniversaries, festivities or holidays. One of the main goals of the last restoration project was to carry out the work to as high a level as possible and in a well thought out manner, in order to reduce the frequency of restorations with correct maintenance. In terms of wall and ceiling paintings, one of the key factors are climatic conditions inside the building; very important, for example, is the ventilation system as a constant suitable micro-climate must be ensured, which has a crucial influence on the preservation of wall paintings.

It is now easier to determine what the original paintings were like through studying different restorations and some of the damage, but at the same time due to lack of information regarding some of the restorations (e.g. the one between 1959 and 1961) we have again reaffirmed what an important role is played by good quality documentation of all the treatments during restoration processes. We have once more reached the very important conclusion that during the evaluation of a work of art we must equally take into account

²³⁷ In 1957 it was restored by Mirko Šubic: PAVLOVEC 1976, p. 371; it is still exceptionally well-preserved.

²³⁸ The Perusinis said that a typical feature of Quaglio's works in Friuli is chromaticism, whilst in the Ljubljana cathedral the colour palette cools down somewhat and later becomes Rococo: PERUSINI 2003, p. 386. We must be aware of the fact that in the cathedral the spectre of damage is more complex because of the more unsuitable and unstable climatic conditions the wall paintings are exposed to than those in private chapels and palaces (in Friuli, for example).

²³⁹ ROPRET, 20 November 2003.

²⁴⁰ After a discussion with the project leader, Rado Zoubek.

²⁴¹ There is no more detailed data regarding the procedures, materials and tools he used during the restoration of the nave vault.

²⁴² ROPRET, 20 November 2003, ROPRET, 8 January 2004. See articles by Polonca Ropret, Rado Zoubek, Marta Bensa, Giovanna Nevyjel, Claudia Ragazzoni.

²⁴³ Cf.: BOGOVČIČ 2004, p. 6. In future, a more detailed study and publication about the history of conservation and restoration profession in Slovenia will be urgently needed.

both fundamental dimensions: both its material and its spiritual value, i.e. historical-artistic, symbolic and aesthetic. This is why during this project it was crucial that there was interdisciplinary cooperation of various professions at the point where the areas of natural sciences and the humanities overlap. Studying and learning about a work of art from different aspects has contributed greatly to more suitable and successful conservation-restoration work on one of the most important Baroque illusionistic wall paintings in Slovenia, executed by Giulio Quaglio on the nave vault in the Ljubljana Cathedral.

Investigations of colour layers

Polonca Ropret

KEY WORDS:

chemical cleaning, ammonium carbonate, retouching binders, Tylose MH

ABSTRACT

When investigating the state of the colour layers of the wall and ceiling paintings on the nave vault of the Cathedral of St Nicholas in Ljubljana, a change in the original composition of calcium carbonate to calcium sulphate was determined. During this process the surface became powdery and the dust particles from the air got caught into the top colour layer, causing the surface to darken. The additional factor that caused the surface of the wall and ceiling painting to darken was also the decaying casein layer, which was applied to the whole surface of the nave vault at the beginning of the 20th century, probably intending to consolidate the surface containing the dust particles. The colour layers containing cinnabar and smalt were found to have undergone changes. The black form of cinnabar Metacinnabar (α -HgS) was determined, as well as a migration of cobalt and potassium ions from the smalt pigment particles, which obviously takes place also in lime forms.

Giulio Quaglio's colour palette was determined: yellow ochre ($\text{Fe}_2\text{O}_3 \times n\text{H}_2\text{O}$), red iron oxide (Fe_2O_3), green earth (hydrosilicates Fe^{2+} , gFe^{3+} , Al^{3+} , K^+ , Mg^{2+}); the minerals celadonite, glauconite), smalt (SiO_2 , K_2O , CoO , As_2O_3), caput mortuum (Fe^{2+} oxides), umbra (Mn^{4+} , Fe^{3+} , Al^{3+} oxides), minium (Pb_3O_4), cinnabar (HgS), and carbon black (C).

Investigations on chemical cleaning testing procedures found that a saturated solution of ammonium carbonate or ammonium bicarbonate was the best reagent for the transformation of calcium sulphate to calcium carbonate. Cellulose pulp of different length fibres, or a combination of cellulose pulp and silicate absorber in proportion 1:1, were found to be most suitable as an absorber. The time of application of the reagent in the absorber was found to be dependent on the amount of the transformed calcium carbonate to calcium sulphate, and took up to two hours in the most affected areas.

In investigations on the effect of temperature fluctuations, relative humidity and UV-VIS radiation on the binders Klucel EF, Tylose MH, ammonium caseinate, Primal AC33 and Paraloid B-72, it was found that Tylose MH was the most stable, and was then used as a binder for retouching parts where the original colour layers were missing.

DEFINITION OF THE CONDITION OF THE COLOUR LAYERS

Experimental conditions

Sample removal and preparation

To determine the state of the colour layers¹, micro samples were taken from 25 different parts on surfaces of the wall and ceiling paintings on the nave vault (figure 1). For examination using an optical microscope and SEM/EDS (scanning electron microscopy / energy dispersive spectroscopy) analysis and a Raman spectrometer attached to an optical microscope, samples were embedded in polyester resin and hardened in a dryer at 50°C. The hardened embedded samples were then ground to obtain sample cross-sections (figure 2) and the surfaces of the cross-sections were additionally polished.

To determine crystalline components using X-ray powder diffraction, a colour layer of the wall painting was carefully removed, ground and homogenised in an agate mortar.



Figure 1: Example of the locations of sample removal on the red drapery (no. 139 and 140).

¹ In the Slovenian version of the text, the phrase *barvni sloj*, meaning colour layer is used, however, I am highlighting here that in the restoration profession the term *barvna plast* (paint layer) may be more appropriate (according to Prof. Mag. Bogovčič).



Figure 2: Photomicrograph of the cross-section of sample no. 140. Red colour layer on lime ground. Magnification 400x.

To determine organic components using a FTIR (Fourier transform infrared) spectrometer attached to an optical microscope, colour layers were separated under a stereomicroscope and placed into the diamond cell of the FTIR microscope (figure 3).

Due to the extensive research required for each sample, presented here are only the most interesting and significant samples.

Instrumental techniques

Optical microscopy

The polished cross-sections of the colour layers were examined using the Olympus BX60 optical microscope and recorded with a JVC 3-CCD video camera.

Scanning Electron Microscopy with Energy Dispersive Spectroscopy (SEM/EDS)

The polished cross-sections of the colour layers were analysed using an electron scanning microscope (SEM, JEOL 5500 LV, Japan) in low vacuum mode, in which it was not necessary to coat the surface of samples cross-sections with an additional layer of graphite or gold. In such a way the sample surfaces were not damaged and the samples could be used in further investigations utilising different techniques. Qualitative and quantitative elemental analysis of selected areas of samples was carried out using energy dispersive X-ray spectrometry (EDS, Oxford Instruments, Great Britain) using the Oxford INCA software.

Fourier Transform Infrared Microscopy

In investigations using infra-red spectroscopy, samples were placed in a Specac GS02550 Diasqueese Plus Diamond Compression Cell. Infra-red spectra were recorded using a

PerkinElmer FTIR spectrometer Spectrum GX with an AutoIMAGE FTIR microscope.

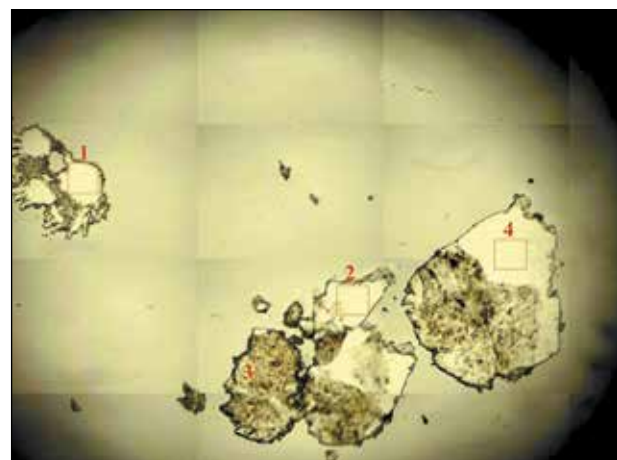


Figure 3: Photomicrograph of pieces of coating squeezed between two diamonds in the diamond cell of the FTIR microscope. Areas of analyses are denoted by marked quadrants (1-4).

Raman Microscopy

Analyses were performed with a Raman microscope with a Renishaw system 1000 using a $\lambda_0 = 785$ nm laser. Sample cross-sections were placed on the stage plate of a Leica optical microscope attached to a Raman spectrometer and examined by focusing the laser beam with x50 lenses. The spectra were recorded using a CCD detector with a spectral resolution of ca. 1 cm^{-1} at 1000 cm^{-1} . The calibration of the spectrometer was performed with a silicon crystal and cyclohexane.

X-Ray Powder Diffraction

X-ray powder images were taken using a Huber Guinier camera 620 (Cu K_α). Identification was performed by comparing sample images with standard images in the PDF² database using a μPDSM^3 computer program.

Results and discussion

Definition of the darkened lips and cheeks

One of the most obvious visual changes in the colour layers was the darkening of the lips and cheeks on the figures on the wall paintings (figure 4). The results of X-ray powder diffraction (Table 1) revealed a transformation of the red form of cinnabar (Cinnabar α -HgS) to the black form of cinnabar (Metacinnabar α' -HgS). Obviously the wall paintings were subjected to conditions that caused this typical change of pigment. Sample no. 119 is provided as an example.

Besides cinnabar, the red pigment minium (Minium Pb_3O_4) is also present in this colour layer, for which it is also typical to transform into the black form PbO_2 in daylight – however, this was not detected with X-ray powder diffraction. The mechanisms of the transformation of minium into black lead dioxide are still not completely known.⁴

² PDF, 1999.

³ μPDSM , 4.30.

⁴ FELLER 1986.



a



b

Figure 4: a) Detail of darkening in the angel's face. b) Location of sample removal (no. 119).

Another way in which the minium could have darkened is the occurrence of lead sulphide, which forms in the presence of hydrogen sulphide or sulphide pigments, such as, for example, cinnabar. Nevertheless, even if the change in the mentioned pigment occurred, the levels of lead dioxide or lead sulphide in the samples remain below the level of detection.

The presence of calcium carbonate in the sample is expected since this was one of the components that are frequently contained in wall paintings. When gypsum was detected it was necessary to address the question as to whether the artist Giulio Quaglio added gypsum to the original layer itself during the creation of the painting, or whether the presence of calcium sulphate came as a result of the transformation of calcium carbonate due to the presence of SO_2 in the air. For this reason, 25 different samples taken from the ceiling painting were examined.

Table 1: Comparison of diffraction lines (d) and relative intensities (I/I₀) in sample no. 119 taken from the darkened lips, with lines of compounds from PDF5. Mineral names and numbers of PDF cards are also given.

Sample no. 119	HgS Cinnabar 42-1408*		Pb ₃ O ₄ Minium 41-1493*		HgS Metacinnabar 6-21		CaSO ₄ ·2H ₂ O Gypsum 6-0046D		CaCO ₃ Calcite 24-0027D	
	d [Å]	I/I ₀	d [Å]	I/I ₀	d [Å]	I/I ₀	d [Å]	I/I ₀	d [Å]	I/I ₀
7.576	40						7.56	96		
6.215	10		6.23	16						
5.541	10									
4.277	60						4.27	48		
4.130	10									
3.832	10								3.852	15
3.776	20						3.79	19		
3.614	10	3.594	10	3.659	2					
3.362	90	3.361	212	3.379	100	3.38	100			
3.289	10			3.282	8					
3.213	30									
3.159	70	3.165	49				3.163	3.8*		
3.112	30			3.116	18					
3.059	60									
3.032	60								3.030	51
2.9592	20									
2.9303	20					2.926	35			
2.8994	40			2.904	45					
2.8595	100	2.865	197				2.867	24*		
2.8019	20			2.787	37					
2.7869	10						2.786	5.8		
2.7143	10									
2.6806	30						2.679	27		
2.6304	10			2.632	27					
2.4509	30			2.445	2		2.450	3.8*		
2.3741	20	2.3757	11	2.291	3					
2.2762	10								2.284	9.2
2.2726	20									
2.2451	10									
2.2161	10						2.216	5.8		
2.1918	10			2.204	1					
2.1282	10						2.139	1.9		
2.0702	50	2.0746	45	2.078	1*	2.068	55	2.073	7.7*	
2.0219	20	2.0272	13	2.033	7					
1.9807	60	1.9815	40							
1.9091	20			1.9133	18				1.9071	8.7
1.8753	20			1.8878	1		1.879	9.6	1.8726	17
1.7613	30	1.7653	28	1.7630	2*	1.764	45			
1.7504	30			1.7556	26					
1.7331	40	1.7352	30	1.7287	1*					
1.6776	70	1.6799	34			1.689	10			
1.6390	10			1.6413	7					
1.6147	10									
1.6029	10						1.599	1*	1.6040	7.7
1.5801	10	1.5827	8	1.5879	7		1.584	1.9*	1.5821	1
1.5611	10	1.5625	6	1.5591	5					
1.4313	20	1.4328	8							
1.3721	10			1.3729	1*					
1.3412	10	1.3446	11	1.3473	2	1.342	12			
1.3043	10	1.3056	11			1.3085	10			
1.2653	10	1.2693	4	1.2695	1					
1.2544	10	1.2584	6	1.2584	2					
1.2450	10	1.2482	4	1.2462	4					

⁵ PDF, 1999.



Figure 5: Location of sample no. 117.

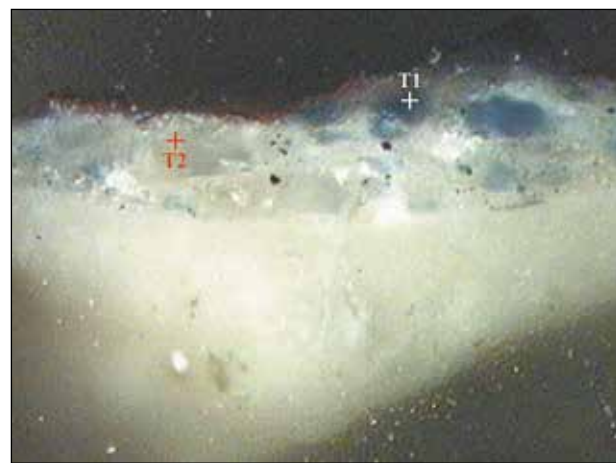


Figure 6: Photomicrograph of the cross-section of sample no. 117. Colour layer with blue pigment on the plaster. T1 and T2 denote the areas of point analysis. 400x.

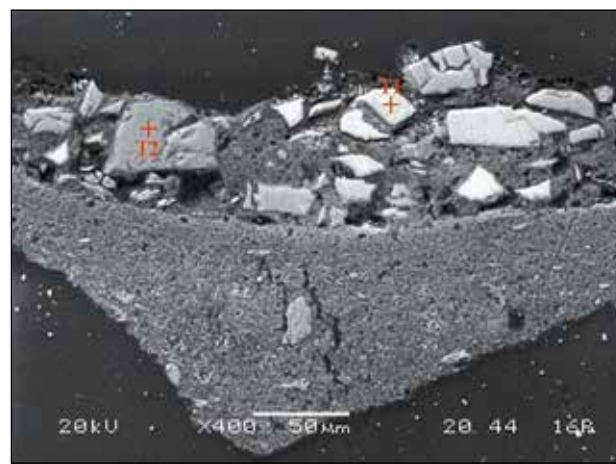


Figure 7 Scanning electron micrograph of the area of EDS mapping analysis in sample no. 117. T1 and T2 denote the areas of point analysis. 400x.

Assessment of gypsum origin

From the results of optic and scanning electron microscopy with EDS qualitative and quantitative mapping analysis it was found that the transformation of calcium carbonate to calcium sulphate had occurred, since the distribution of sulphur in the colour layers was inhomogeneous. The change is most present on the surface, passing into the inside of the colour layer. In certain samples the transformation took place very deeply, since sulphur was detected also in the plaster under the colour layer. Two extreme examples are shown: a surface change (sample no. 117) and a deeper change in the plaster under the colour layer (sample no. 133).

Sample no. 117. Taken from the blue sky on the western nave (figure 5).

Figures 6 and 7 show the areas of sample no. 117, on which EDS mapping and point analysis was performed.

EDS mapping analysis:

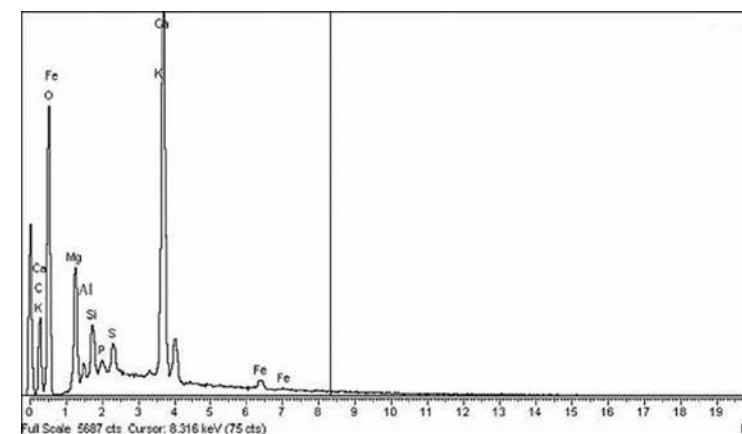
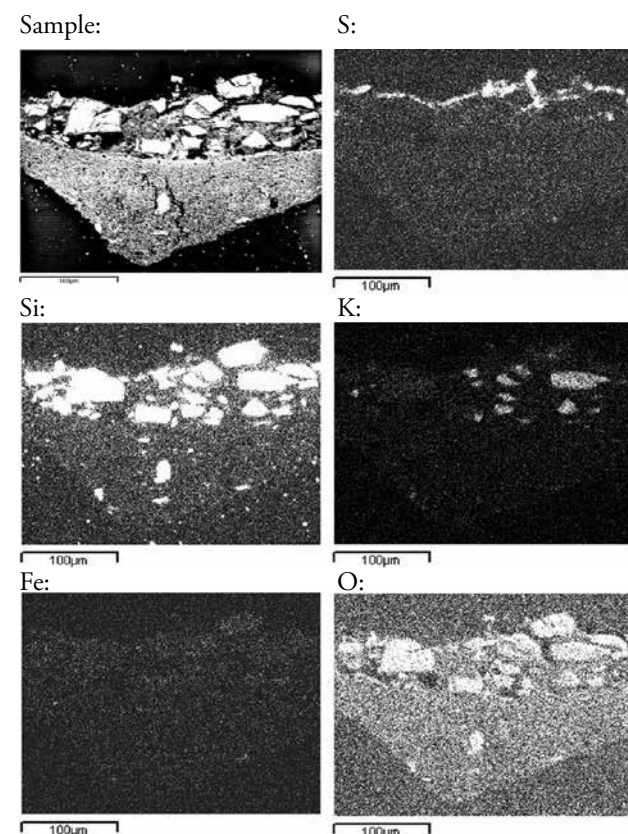


Figure 8: EDS spectrum of the mapping analysis

Element	C	Mg	Si	P	S	K	Ca	Fe	O
w %	16,20	5,31	1,75	0,40	0,90	0,34	16,50	1,12	57,48

It is obvious from the distribution of sulphur that in the area of removal of sample no. 117, the change from calcium carbonate to calcium sulphate took place only on the surface. The mass fraction of sulphur in the whole of the sample is 0.90%. Magnesium is probably present in dolomite form and was applied to the layers with the lime itself. Dolomite has not been confirmed in X-ray powder diffraction, probably due to its very low concentration.

The pigment in the colour layer is smalt, which contains SiO₂, K₂O, As₂O₃ and CoO. Silicon and potassium, which are mostly present in the pigments in the form of oxides, are clearly visible in the small particles of the pigment. Co and As were not detected with mapping analysis because their mass fraction is too small. Iron is probably present in oxide form as an impurity. For an accurate analysis of the blue pigment, point analysis was performed (figures 9 and 10).

It can be seen from figure 6 that certain parts of the pigment are discoloured, now displaying only a slightly blue colour, even though the pigment should remain stable in combination with lime. If we compare the positions of the discoloured pigment particles with the EDS mapping of silicon and potassium, we notice that potassium is not present in these particles, or at least it is present to a much lesser extent than in the blue coloured parts, whereas the mapping of the silicon correlates with the positions of the discoloured and blue coloured particles. This indicates a possibility of migration of potassium from the pigment mineral structure in the ageing process, which is otherwise typical for smalt in the oil medium.

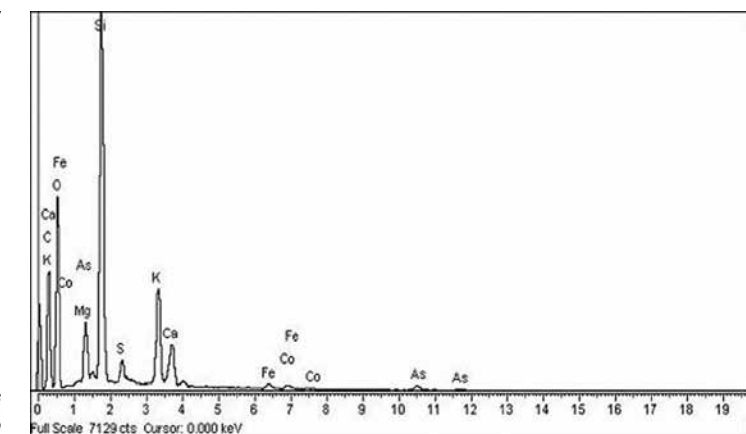


Figure 9: EDS spectrum of point analysis in T1 on a part of the blue pigment

Element	C	O	Mg	Si	S	K	Ca	Fe	Co	As
w %	32,89	45,03	0,52	11,12	0,64	3,94	1,79	0,46	0,52	3,09

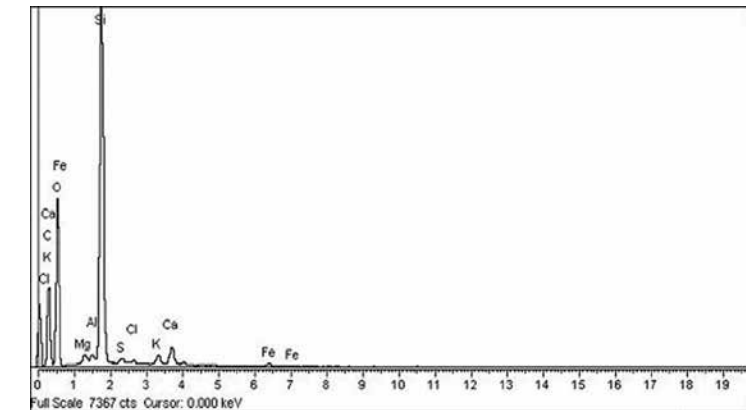


Figure 10: EDS spectrum of point analysis in T2 on a part of the discoloured pigment

Element	C	O	Mg	Al	Si	S	Cl	K	Ca	Fe
w %	33,03	49,71	0,42	0,08	14,44	0,21	0,13	0,59	1,07	0,40

The elemental composition of the blue part (analysis of point T1) corresponds to the composition of smalt⁶. The Co and As in the discoloured part were not detected. The mass fraction of As in smalt can vary between 0 and 8%, whereas in the case of Co, a migration of cobalt ions from the particles probably occurred. The same can be said for the potassium, whose mass fraction decreased in comparison with the blue particles from 3.94% to 0.59%. The pigment is obviously subject to changes in the lime medium.

⁶ ASHOK 1993.

Sample no. 133.

Taken from the violet background on the western side of the nave (figure 11).

Figures 12 and 13 show the area of sample no. 133 on which EDS mapping and point analysis were performed.

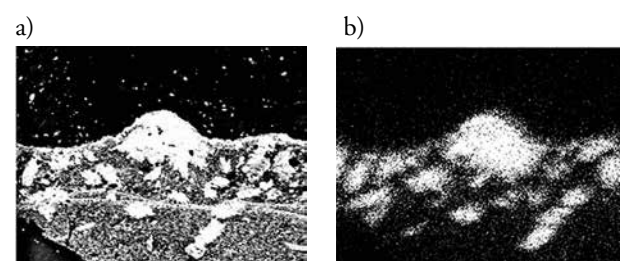


Figure 14: EDS mapping analysis of the sample: a) analysed area of the sample b) distribution of sulphur in the sample.

From the distribution of sulphur (figure 14b) it is evident that in this area of sample removal, the transformation of calcium carbonate to calcium sulphate took place deep into the plaster underneath the colour layer. From the analysis of point T1 (figure 12), the molar ratio between calcium and sulphur can be calculated, obtaining $n_{Ca} = 2n_S$, which indicates that in the area of point T1 approximately half of the calcium carbonate was transformed into calcium sulphate.

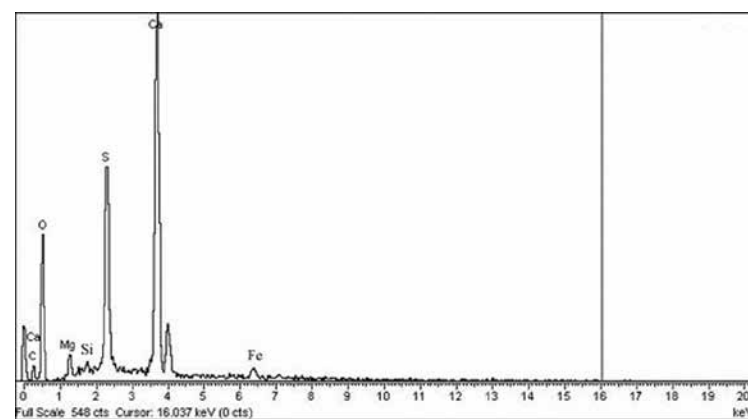


Figure 15: EDS spectrum of point T1 in sample no. 133

Element	C	Mg	Si	S	Ca	Fe	O
w %	5,81	1,53	0,35	8,96	24,02	1,53	57,80



Figure 11: Location of sample no. 133.

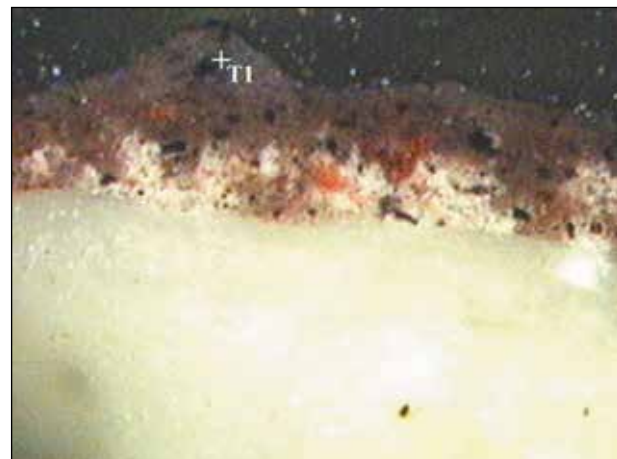


Figure 12: Photomicrograph of the cross-section of sample no. 133. Colour layer with pigments on plaster. T1 denotes the area of point analysis. 450x.

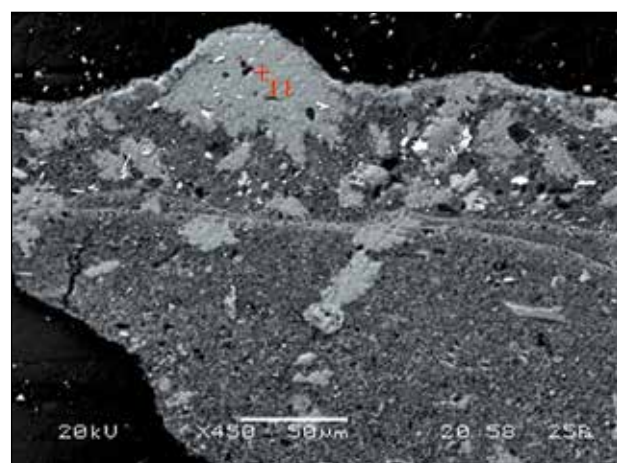


Figure 13: Scanning electron micrograph of the area of EDS mapping analysis in sample no. 133. T1 denotes the area of point analysis. 450x.

It was found that the depth of the transformation of the carbonate to the sulphate corresponds to the results of the thermography of the nave vault. The colder areas discovered by thermography (for example in the proximity of windows) displayed a deeper transformation to the sulphate, therefore the samples taken from the areas where temperature fluctuations and relative humidity were greater over the year, displayed a deeper transformation. This confirms that a transformation to a sulphate requires the presence of moisture on the surface. A deep transformation was also present in the areas where the roof had leaked in the past.

Quaglio's colour palette

Optical and scanning electron microscopy with EDS analysis, and in some cases also X-ray powder diffraction and Raman microscopy, were used to determine pigments in their original colour layers – the artist Giulio Quaglio's palette therefore – and the pigments of later overpaints used in previous restoration treatments, in samples taken from 25 different surfaces. Due to the extensive results from researched samples, only the list of pigment is presented.

Original layer (Giulio Quaglio's colour palette):

- yellow ochre ($Fe_2O_3 \times nH_2O$)
- red iron oxide (Fe_2O_3)
- green earth (hydrosilicates Fe^{2+} , Fe^{3+} , Al^{3+} , K^+ , Mg^{2+} ; minerals celadonite, glauconite)
- smalt (SiO_2 , K_2O , CoO , As_2O_3)
- caput mortuum (Fe^{2+} oxides)
- umbra (Mn^{4+} , Fe^{3+} , Al^{3+} oxides)
- minium (Pb_3O_4)
- cinnabar (HgS)
- carbon black (C)

Overpainting (previous restoration treatment):

- Prussian blue ($Fe_4[Fe(CN)_6]_3$)
- barium white ($BaSO_4$)
- zinc white (ZnO)
- red iron oxide (Fe_2O_3)
- red organic pigment
- ultramarine ($Na_{3...10}Al_6Si_6O_{24}S_{2...4}$)
- red or white lead pigment
- lead-tin yellow – type I (Pb_2SnO_4)
- lead white ($2PbCO_3 \times Pb(OH)_2$)
- massicot (PbO)

Identification of the coating

According to research findings⁷ of older restorative treatment on Quaglio's wall and ceiling paintings in Ljubljana Cathedral, it is possible to deduce that a "coating" was applied to the whole of the nave, most probably to consolidate the surface, which must have contained a fair amount of dust particles due to the formation of calcium sulphate. In the first attempt to identify sample no. 142 (figure 16) using FTIR microscopy, it was merely found that a protein component was present, since intense and broad $\nu_3(C-O)$ stretching vibration of the carbonate between 1500 and 1400 cm^{-1} covered the majority of the spectrum, in the region of which smaller differences between the protein binders could also be discerned. The extraction was performed on a micro-sample under a stereo-microscope with 1M NaOH. During the procedure, the coating softened to such an extent that it was possible to partially separate it from the carbonate particles and place it in the diamond cell of the FTIR microscope.

The IR spectrum of areas 1, 2 and 4 (see figure 3) is the same and corresponds to the spectrum for casein (figure 17). According to the presence of amide groups in the casein, the following vibrations were found: N – H (attached with a hydrogen bond) stretching vibration can be noticed at 3285 cm^{-1} , with a smaller band at 3073 cm^{-1} , which is a Fermi resonance enhanced overtone of the band at 1548 cm^{-1} . The absorption band at 1548 cm^{-1} is made up of C – N stretching vibration and C – N – H in plane stretch-bending mode. This band is very characteristic for acyclic mono-substituted amides. Stretch-open mode is weaker in IR at around 1310



Figure 16: Location of removal of sample no. 142 represented by the area contained in the red quadrant.

⁷ SITAR 2004–2006 a.

– 1250 cm^{-1} . A very strong band at 1651 cm^{-1} can be ascribed to C = O stretching vibration.⁸

In IR spectra of casein and animal glue there are remarkably small differences in the region between 1650 cm^{-1} and 1200 cm^{-1} ; mainly the animal glue absorption bands are broader. Therefore, in order to confirm the presence of casein, an elemental analysis of the coating was also performed, which established the presence of phosphorus, 0.46 %. A sample of pure casein can contain up to 0.8% phosphorus.⁹

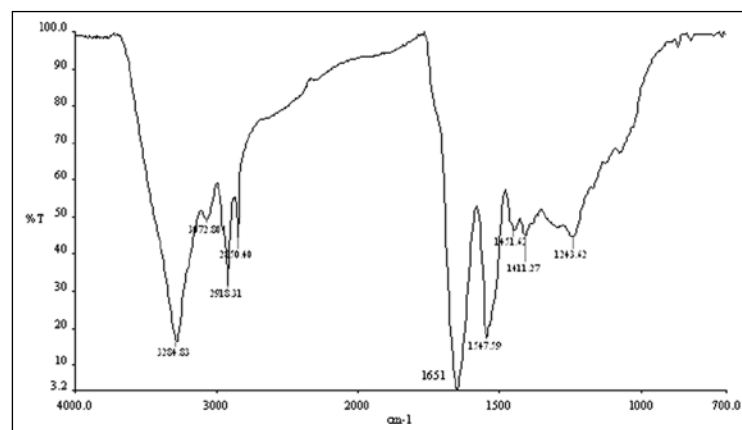


Figure 17: IR spectrum of areas 1, 2 and 4 in sample no. 142, which corresponds to the reference spectrum for casein.

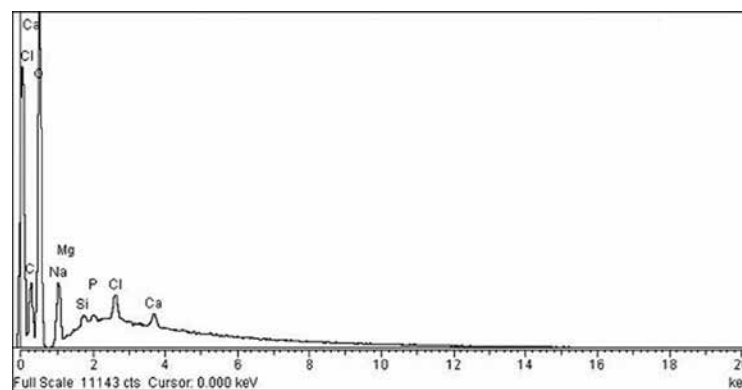


Figure 18: EDS spectrum of the coating, sample no. 142.

Element	C	Na	Mg	Si	P	Cl	Ca	O
w %	22,13	9,04	0,33	0,73	0,46	1,94	1,17	64,20

⁸ LIN VIEN, COLTHUP, FATELEY, GRASSELLI 1991.

⁹ MILLS, WHITE 1987.

Identification of the changes in the ochre colour layer

Figure 19 illustrates the darkening of the ochre colour layer in the overpainted areas of the figure.



Figure 19: Locations of removal of samples SNL 229 – 234.

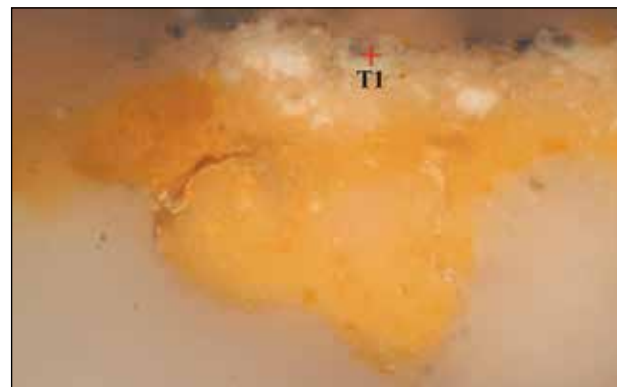


Figure 20: Cross-section of sample SNL 231. T1 is the examined area.

The analysis of the darkened parts of pigments in the colour layer of sample SNL 231 (figure 20) is provided as an example in identifying changes.

The Raman spectrum (figure 21) shows the presence of the pigments lead-tin yellow (type I), lead white and mas-

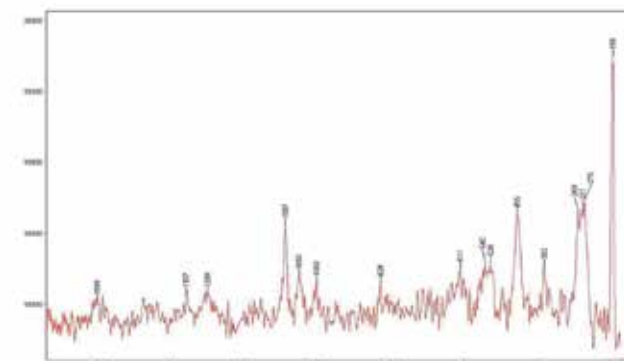


Figure 21: Raman spectrum of pigment particles in the area of T1.

sicot, and a small amount of calcite, in the T1 area¹⁰. The presence of plattnerite (a dark brown PbO_2) indicates a degradation of lead white and massicot, which caused the darkening of the colour layer on the location of sample SNL 231.

CHEMICAL CLEANING

Cleaning of wall paintings should aim to assure the preservation and stability of the original colour layers. This is needed on the surfaces where changes have occurred in the colour layers due to processes of natural ageing, negative environmental impacts, or unsuitable materials used in previous restoration treatments.¹¹ Given the composition of the surface of the wall paintings itself, which is in most cases porous and contains calcites, mechanical cleaning is most recommended, which however proved insufficient in the case of the nave vault in the cathedral, and chemical cleaning was required. Taking into account the analysis results on the material components present, which showed the transformation of calcium carbonate to calcium sulphate, and the presence of the darkened casein coating on the surface of the painting, chemical cleaning aimed to achieve the following: the transformation of the calcium sulphate produced into calcium carbonate, and the removal of the casein coating from the surface of the painting. Before cleaning the whole of the nave vault (ca. 600 m^2), different chemical cleaning procedures were tested.

Experimental conditions

Chemical cleaning testing procedures¹²

The tests to find the most suitable reagent, absorber and time of application were carried out on surfaces measuring

ca. 10 x 10 cm^2 . The suitability of using the ammonium carbonate and bicarbonate method and the ion exchange resin method was tested.

Cleaning with ammonium carbonate and bicarbonate

For the conversion of calcium sulphate into calcium carbonate, $(\text{NH}_4)_2\text{CO}_3$ and NH_4HCO_3 in different absorbers were tested: carbogel, cellulose pulp of different length fibres, and a silicate absorber. The prepared saturated solution of the reagent was added to the absorber. When the mixture swelled up, it was applied to the surface of the wall painting over the Japanese restoration paper. Different times of application were tested: 15 minutes, 30 minutes, 1 hour and 2 hours. The absorber and Japanese restoration paper were then removed and the surface was wiped several times with a moist sponge. The content and distribution of sulphur in the samples was monitored with EDS mapping analyses of elements before and after cleaning.

Manufacturer C.T.S.: Carbogel, Arbocel (cellulose pulp), Seppiolite (silicate absorber), $(\text{NH}_4)_2\text{CO}_3$, NH_4HCO_3 .

Consolidation with barium hydroxide

To find out if barium hydroxide was suitable for the stabilisation of colour layers after treatment with ammonium carbonate and bicarbonate, the following procedure was used. Deionised water was added to cellulose pulp, which was left to swell up overnight. The excess water was wrought out and barium hydroxide added (100 g $\text{Ba}(\text{OH})_2 \times 8\text{H}_2\text{O}$ to every 1kg of the mixture). The mixture was then applied to the surface over the Japanese restoration paper and removed after 4 hours. The content and distribution of barium in the samples was monitored with EDS mapping analyses before and after application.

Manufacturer C.T.S.: $\text{Ba}(\text{OH})_2 \times 8\text{H}_2\text{O}$

Cleaning with ion exchange resin

To transform calcium sulphate to calcium carbonate, the anion exchange resin method was also tested. 1p in weight of resin was mixed with 1p in weight of deionised water. When the mixture swelled up, it was applied to the surface of the wall painting over the Japanese restoration paper. Different times of application were tested: 15 minutes, 30 minutes and 1 hour.

Manufacturer C.T.S.: Akeogel (anion – exchange resin)

¹⁰ BELL, CLARK, GIBBS 1997, pp. 2159–2179. BURGIO, CLARK 2001, pp. 1491–1521.

¹¹ Cf. SITAR 2004–2006 a.

¹² Chemical cleaning testing procedures were carried out in close collaboration with restorer Marta Bensa, who performed the procedures described in the chapters on cleaning with ammonium carbonate and bicarbonate, consolidation with barium hydroxide and cleaning with ion exchange resin.

Sample removal and preparation

Micro samples were removed from 25 different areas of the wall and ceiling paintings, before and after cleaning. Samples were then embedded in polyester resin and hardened in a dryer at 50°C. The hardened embedded samples were then ground to obtain cross-sections. The surfaces of the cross-sections were additionally polished.

Due to the extensive research required for each sample, only the most interesting and significant samples are presented.

Instrumental techniques

Optical microscopy

The colour layers of the polished cross-sections were examined using the Olympus BX60 optical microscope and recorded with a JVC 3-CCD video camera.

Scanning Electron Microscopy with Energy Dispersive Spectroscopy (SEM/EDS)

The polished cross-sections of the colour layers were analysed using an electron scanning microscope (SEM, JEOL 5500 LV, Japan) in low vacuum mode, in which it was not necessary to coat the surface of samples cross-sections with an additional layer of graphite or gold. In such a way the sample surfaces were not damaged and the samples could be used in further investigations utilising different techniques. Qualitative and quantitative elemental analysis of selected areas of samples was carried out using energy dispersive X-ray spectrometry (EDS, Oxford Instruments, Great Britain) using the Oxford INCA software.

Results and discussion

Cleaning with ammonium carbonate and bicarbonate

On different surfaces with different levels of sulphate formation, it was shown visually and by EDS mapping analyses of samples that an application of the coating lasting less than an hour was insufficient. After application of NH_4HCO_3 in carbopol (absorber) to the surface of the ochre background (figure 1) in the central part of the nave, the sulphur content decreased from 2.62% (figures 2, 4b) in the sample taken before cleaning, to 0.32% (figures 3, 4d) in the sample taken after cleaning.

By applying a saturated solution of the reagent in the absorber onto the wall painting, an excess of ions occurred and a diffusion process of ammonium NH_4^+ and carbonate CO_3^{2-} ions from the surface into the interior of the porous structure of the wall painting took place. After removing the



Figure 1: Sample locations for testing chemical cleaning procedures. 155a – before cleaning, 153 – after application of NH_4HCO_3 , 155 – after application of NH_4HCO_3 and consolidation with $\text{Ba}(\text{OH})_2 \times 8\text{H}_2\text{O}$, 156 – after application of ion exchange resin.

absorber with reagent, a shortage of ions occurred on the surface and diffusion of ammonium NH_4^+ with the SO_4^{2-} sulphate ions produced in the reaction (1) took place in the opposite direction. By sponging off the surface with moisture, the formed ions were largely removed, which would have otherwise crystallised on the surface.

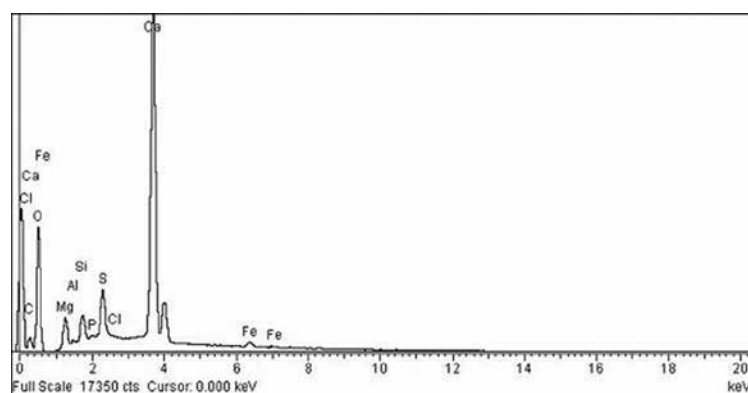
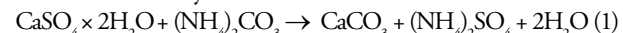


Figure 2: EDS spectrum of mapping analysis in sample no. 155a

Element	C	Mg	Al	Si	P	S	Cl	Ca	Fe	O
w %	2,46	2,65	0,28	1,62	0,08	2,62	0,11	25,65	0,98	63,55

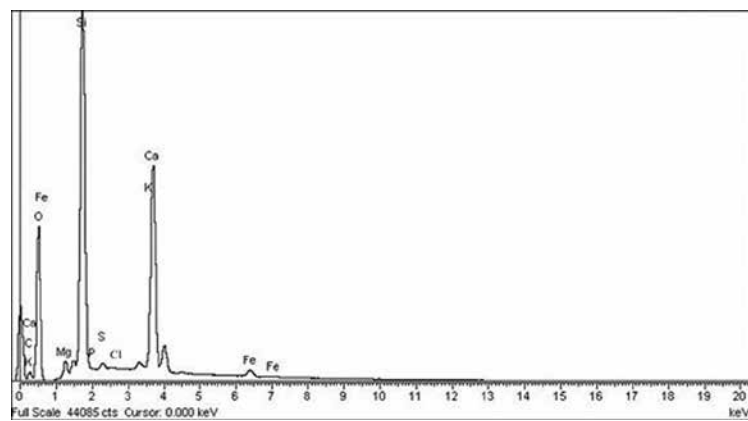


Figure 3: EDS spectrum of mapping analysis in sample no. 153

Element	C	Mg	Si	P	S	Cl	K	Ca	Fe	O
w %	3,46	1,02	18,79	0,15	0,32	0,12	0,53	15,23	1,20	59,18

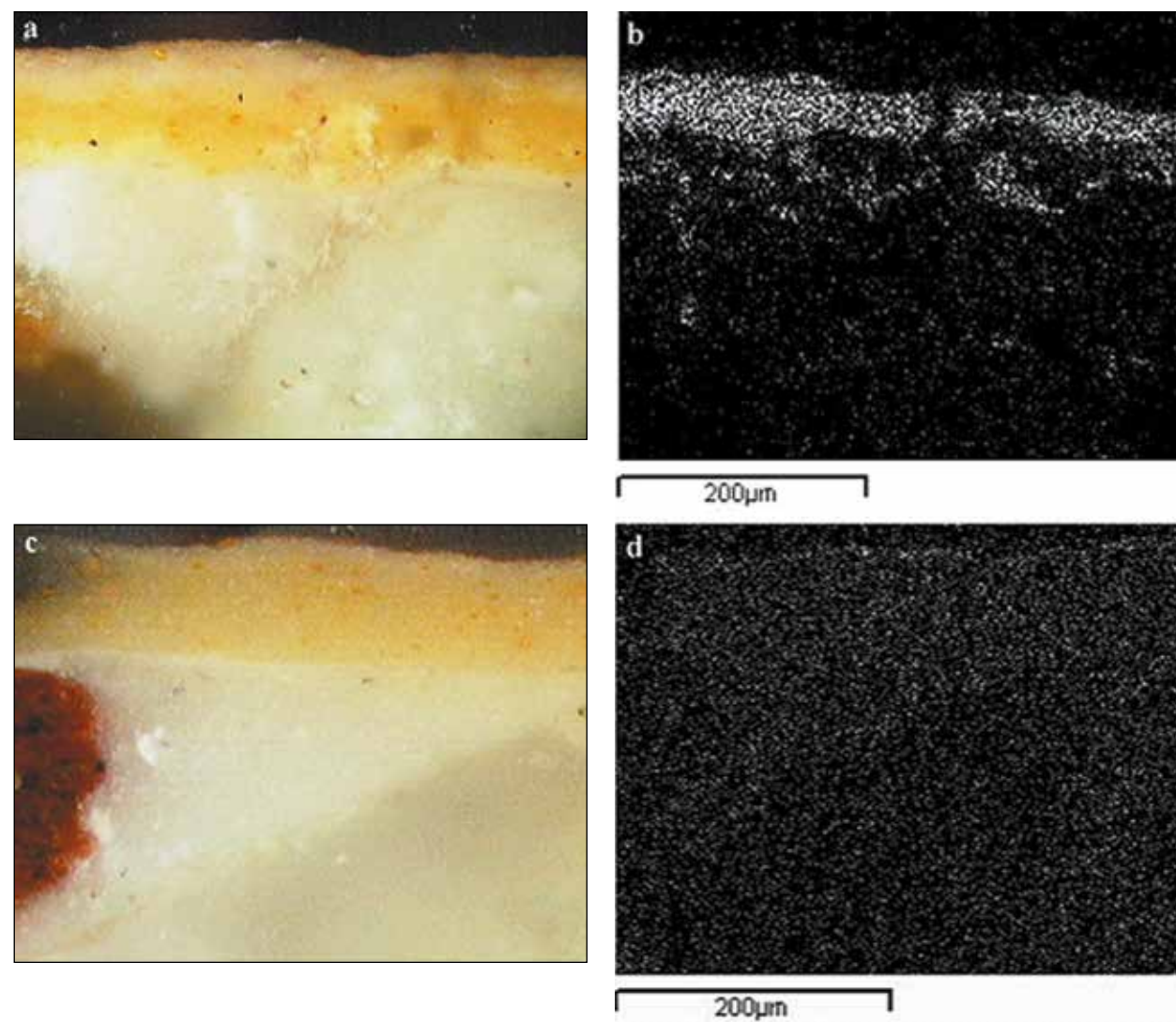
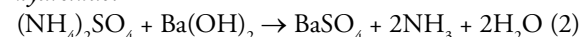


Figure 4: a) Cross-section of sample no. 155a. b) EDS distribution of sulphur on the cross-section of sample no. 155a ($w_s = 2,62\%$). c) Cross-section of sample no. 153. d) EDS distribution of sulphur on the cross-section of sample 153 ($w_s = 0,32\%$).

Figure 4 shows the distribution of sulphur in a sample before cleaning (sample no. 155a) and after cleaning (sample no. 153). The 0.32% sulphur (figure 3) which remained after cleaning is not localised in an area of the sample so it was not possible to detect it with EDS mapping analysis (figure 4d).

According to literature,¹³ colour layers should be stabilised with barium hydroxide after using ammonium bicarbonate or carbonate cleaning procedures. After the reaction (2), the produced barium sulphate should also play the role of consolidating the surface layers. Barium hydroxide was applied to the cleaned surface (figure 1) according to the procedure described in chapter: *Consolidation with barium hydroxide*.



The low fraction of sulphate ions (mass fraction of sulphur $w_s = 0,28\%$, figure 20) that remained in the sample after cleaning with ammonium bicarbonate was still arranged homogeneously in the sample (figure 6b) after $\text{Ba}(\text{OH})_2 \times 8\text{H}_2\text{O}$ application and cannot be followed with EDS mapping analysis at such low levels of concentration. The barium ($w_{\text{Ba}} = 0,71\%$), however, was localised in some pores (figure 6c). Given the suggested reaction (2) and the potential production of BaSO_4 , it could be expected that the positions of sulphur and barium in sample no. 155 correspond, which, however, is not proven by results obtained with EDS mapping analysis (compare figure 6b and 6d). The results obtained in all test procedures of the barium hydroxide method on different surfaces using EDS mapping analysis were the same, hence it was decided not to use this method after cleaning the whole surface of the wall painting on the nave.

¹³ BOTTICELLI 1999, pp. 109–143;; BOTTICELLI 1992; MATTEINI 1999, pp. 48–84.

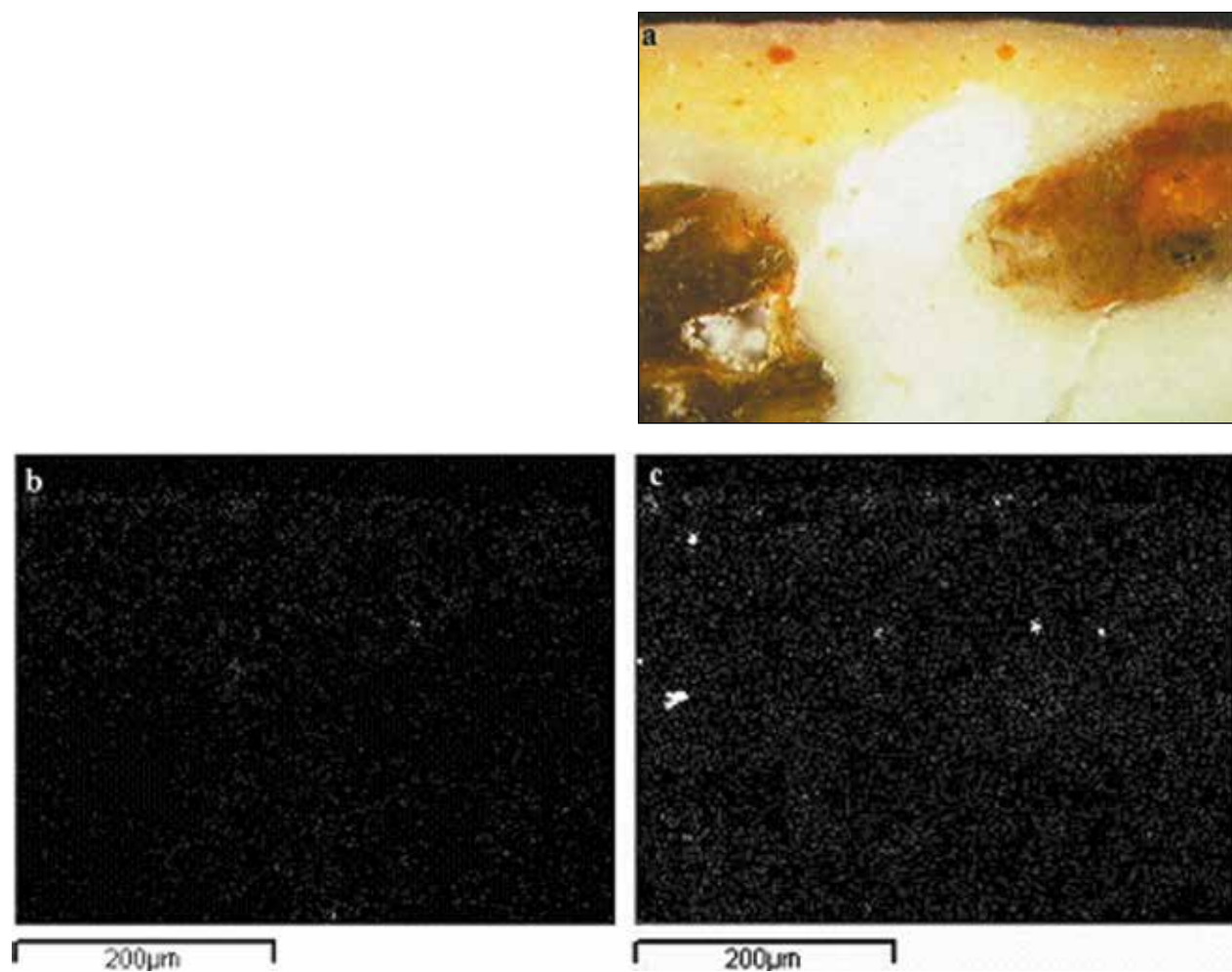


Figure 6: a) Cross-section of sample no. 155. b) EDS distribution of sulphur ($w_s = 0,28\%$) on the cross-section of sample no. 155. c) EDS distribution of barium ($w_{Ba} = 0,71\%$) on the cross-section of sample no. 155.

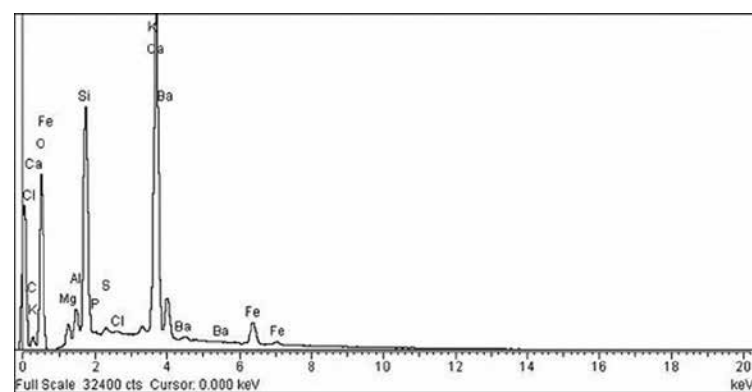


Figure 5: EDS spectrum of the amount of mapping analysis in sample no. 155

Element	C	Mg	Al	Si	P	S	C	K	Ca	Fe	Ba	O
w %	1,82	1,33	1,50	10,97	0,19	0,28	0,10	0,54	19,55	3,43	0,71	59,57

The potential production of $BaSO_4$ would also cause changes in the original wall painting since barium sulphate has been used in painting as a white pigment since Antiquity,¹⁴ which further supports the decision for the method's exclusion.

Sample results for comparison of different absorbers showed that cellulose pulp of different length fibres, or a combination of cellulose pulp and silicate absorber in proportion 1:1, were most suitable. The results of cleaning were improved visually in comparison with results obtained after using carbopol as an absorber, whereas penetration into the depth was as effective with both absorbers. However, with cellulose pulp of different length fibres a better grasp of the surface was achieved, which gave the cleaning a better visual effect with regards to the presence of micro cracks.

The duration of the application of the reagent in the absorber depended on the amount of the calcium carbonate transformed into calcium sulphate, and took two hours in the most affected areas.

¹⁴ FELLER 1986.



Figure 7: Locations of samples no. 158 – before cleaning, and 159 – after cleaning.

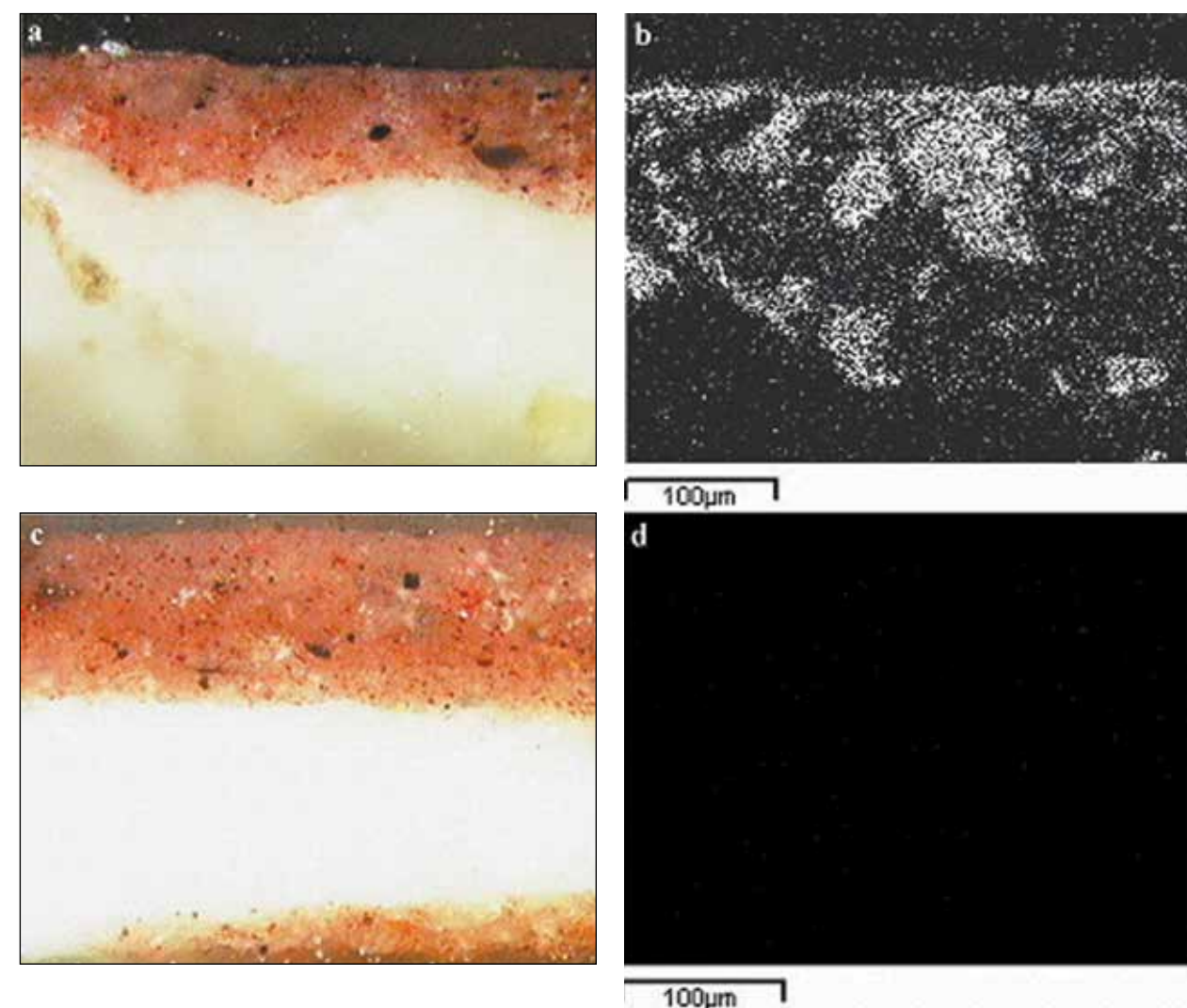


Figure 8: a) Cross-section of sample no. 158. b) EDS distribution of sulphur on the cross-section of sample no. 158 ($w_s = 2.87\%$). c) Image of the cross-section of sample no. 159. d) EDS distribution of sulphur on the cross-section of sample no. 159 ($w_s = 0.21\%$).

Analyses of samples no. 158 and no. 159, taken from the violet background in the eastern part of the nave (figure 7), demonstrate successful cleaning (figure 8) with an application of ammonium carbonate in cellulose pulp lasting two hours, on one of the most damaged areas.

As can be seen from the distribution of sulphur in the sample before cleaning (figure 8b), the transformation of calcium carbonate to calcium sulphate penetrated very deeply in the area of the extracted sample no. 158, proceeding deep into the plaster underneath the colour layer. After a two

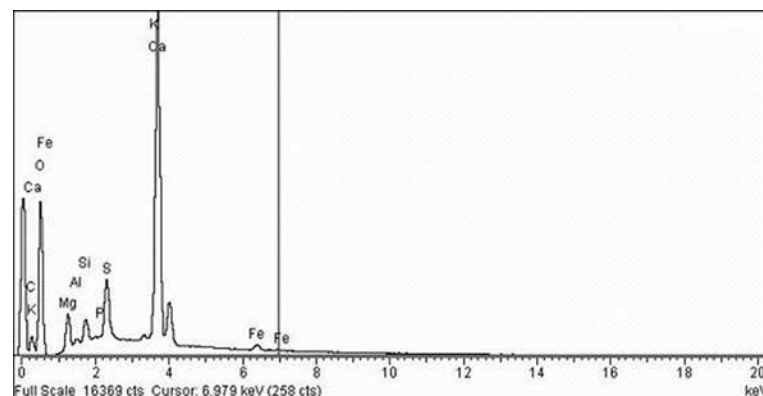


Figure 9: EDS spectrum of the amount of mapping analysis in sample no. 158.

Element	C	Mg	Al	Si	P	S	K	Ca	Fe	O
w %	3,87	2,78	0,44	1,27	0,09	2,87	0,39	22,65	0,93	64,71

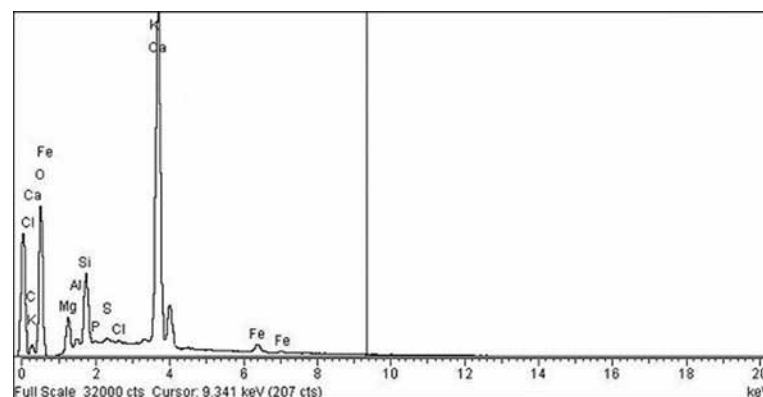


Figure 10: EDS spectrum of the amount of mapping analysis in sample no. 159.

Element	C	Mg	Al	Si	P	S	Cl	K	Ca	Fe	O
w %	2,24	2,76	0,59	4,09	0,14	0,21	0,09	0,36	23,72	1,37	64,71

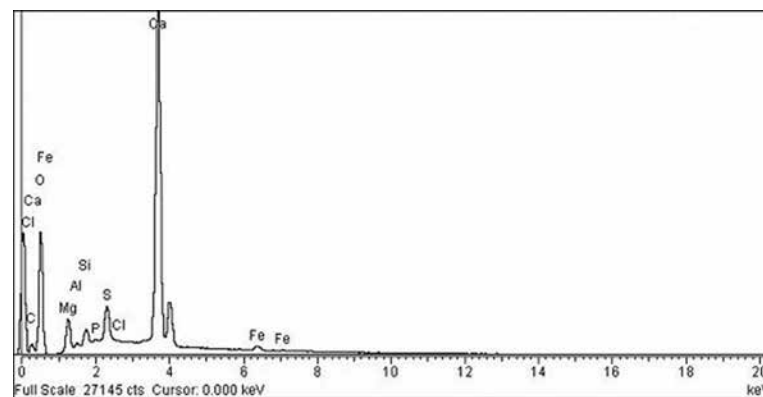


Figure 11: EDS spectrum of the amount of mapping analysis in sample no. 156.

Element	C	Mg	Al	Si	P	S	Cl	Ca	Fe	O
w %	1,90	2,94	0,29	0,96	0,11	2,03	0,08	26,23	0,83	64,24



Figure 13: Successful example of cleaning on a larger surface area.

hour application of ammonium carbonate in cellulose pulp, the mass fraction of sulphur decreased from 2.87% (figure 9) in a sample taken before cleaning, to 0.21% (figure 10) in a sample taken after cleaning.

Cleaning with ion exchange resin

(OH) exchange resin was applied to surfaces measuring ca. 10 x 10 cm² according to the procedure described in chapter: *Chemical cleaning testing procedures – Cleaning with ion exchange resin*. Since results of the application were not as effective after 15, 30 or 60 minutes as with the ammonium carbonate and bicarbonate method, the investigation into duration of application was discontinued. As an example, the analysis of sample no. 156 is provided, which was taken after application to the ochre background in the central part of the nave (figure 1). After a one-hour application, 2.03% sulphur (figure 11) remained in the sample.

The transformation to calcium hydroxide occurred on the surface only, which can be seen in the EDS distribution of sulphur (figure 12b) and suggests that deep cleaning was not successful.

If the effectiveness of the one-hour application of ammonium bicarbonate is compared with the application of ion exchange resin to the surface of the ochre background (figure 1), ca. 12% of the original sulphur content remains in sample no. 153, whereas in sample no. 156, ca. 78% of the sulphur remains untransformed.

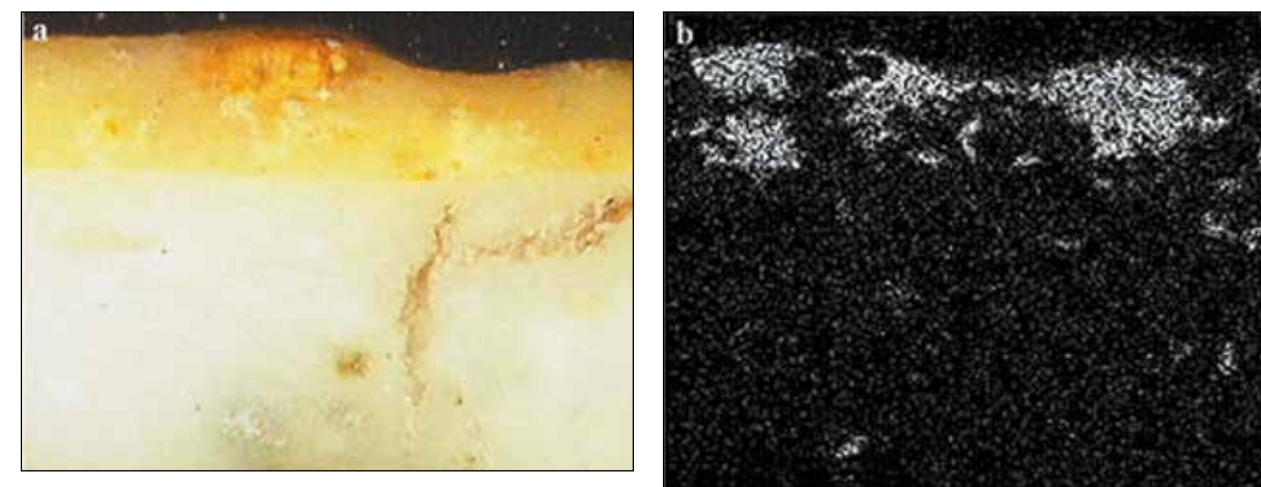


Figure 12: a) Cross-section of sample no. 156. b) EDS distribution of sulphur on the cross-section of sample no. 156 ($w_s = 2,03\%$).

Given the results of test cleaning procedures, the ammonium carbonate and bicarbonate method was used on the whole of the surface (600 m²) of the nave. The areas of application were much larger after determining the appropriate procedure, ca. 1 m². Figure 13 shows an example of cleaning performed on a large area, where the original colour contrast can also be seen.

DEFINITION OF RETOUCHING BINDERS

The retouching binder should conform to certain general demands regarding stability over a longer period of time and reversibility, which means that the retouch can be removed. There are many binders on the market nowadays which are targeted for uses in restoration, however, their stability is normally checked in very specific conditions and no protocols exist as such about what can be used in certain conditions. In choosing a retouch for wall paintings located in a church, it is essential to consider the given micro-climatic conditions, particularly material stability in relation to temperature fluctuations, relative humidity and UV radiation.

In view of available information on the stability of different types of materials and the practical experience of restorers, the following binders were selected for examination: Tylose MH, Klucel EF, which are water-soluble cellulose ethers, ammonium caseinate as a protein-based

binder, Primal AC33 and Paraloid B-72, which are acrylate-methacrylate copolymers.

Experimental conditions

Preparation of samples¹⁵

In order to investigate temperature fluctuations, relative humidity and UV radiation, thin layers of binder samples were mounted on glass slides. In order to investigate the stability of colour layers, samples imitating the structure of a real wall painting in the secco technique were prepared. Lime plaster was mounted on tufa slabs. After three weeks of drying in the air, colour layers were applied to the surface. The paints were prepared with different binders in combination with the pigments: cinnabar, smalt and green earth (figure 1).

Preparation of binders:

Klucel EF : H₂O = 1 : 4
 1.2% water solution of Tylose MH
 Primal AC33 : H₂O = 1 : 10
 30% Paraloid B-72 in toluene

Ammonium caseinate: 1l of cold water and 40g of technical casein was left to swell up overnight. Next day 20ml of ammonia solution (25% p.a.) was added.

¹⁵ Samples were prepared in close collaboration with the project leader Mag. Rado Zoubek, who prepared the binders as colour layers on lime plaster in accordance with appropriate painting technology.

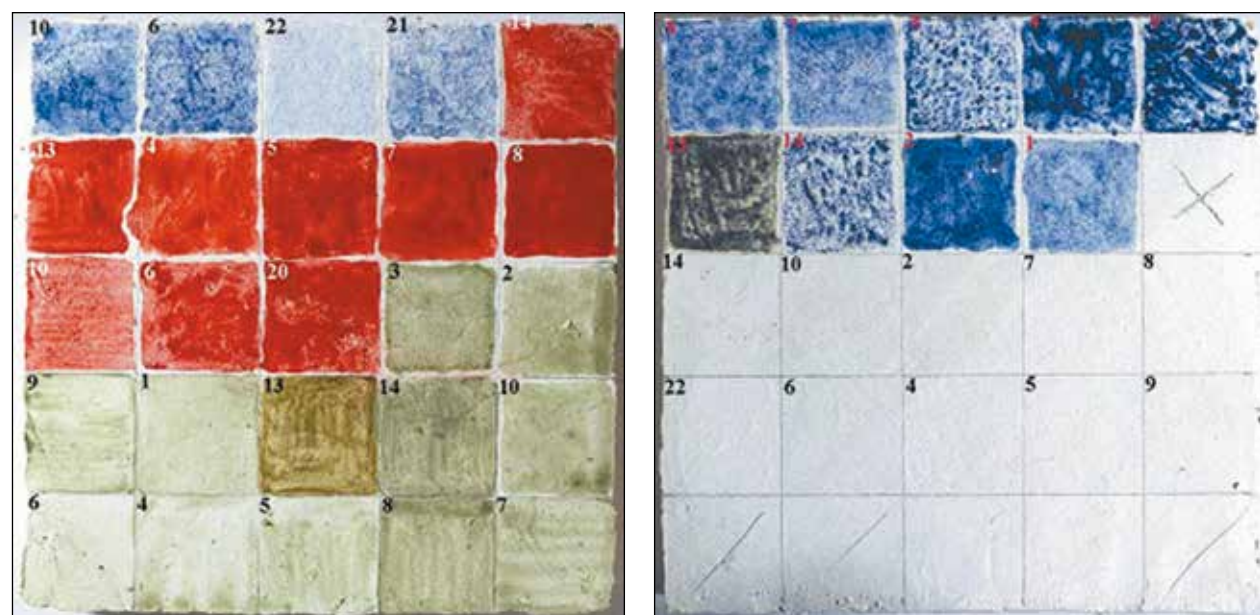


Figure 1: Two prepared slabs with lime plaster and colour layers. a) Binders in combination with the pigments smalt, cinnabar and green earth. b) Binders in combination with the pigment smalt.

Manufacturers: Clariant (Tylose MH, Klucel EF), Rohm and Haas (Primal AC33, Paraloid B-72), Ljubljanske mlekarne (technical casein), Merck (ammonia solution), Kremer Pigmente (cinnabar, smalt, green earth).

In order to investigate the effects of temperature fluctuations, relative humidity and UV radiation on the colour layers on the lime plaster, samples were taken before and after exposure to the conditions in two climatic chambers. Sample cross-sections were prepared for investigation using optical microscopy and SEM/EDS as described in chapter: *Definition of the condition of the colour layers – Sample removal and preparation*. In order to investigate the effects of temperature fluctuations, relative humidity and UV radiation on samples of pure binders by using the FTIR microscope, micro samples were taken from the layers on the glass slides before and after accelerated ageing, and were then placed in the diamond cell of the FTIR microscope.

Conditions in the climatic chambers

Samples were exposed to temperature fluctuations, relative humidity and UV radiation in two climatic chambers. In the first, temperature and relative humidity fluctuated in three cycles per day. The conditions of one cycle:

T (°C)	RH (%)
20	-
0	-
20	-
50	90

Tufa slabs with lime plaster and colour layers were placed in the chamber at a 45° angle. After a month, the samples were transferred into a second chamber where they were exposed to the radiation of a metal halide lamp, whose UV-VIS spectrum is very similar to the spectrum of sunlight.

Instrumental techniques

Optical microscopy

The polished cross-sections of the colour layers were examined using the Olympus BX60 optical microscope and recorded with a JVC 3-CCD video camera.

Scanning Electron Microscopy with Energy Dispersive Spectroscopy (SEM/EDS)¹⁶

The polished cross-sections of the colour layers were analysed using an electron scanning microscope (SEM, JEOL 5500 LV, Japan) in low vacuum mode, in which it was not necessary to coat the surface of samples cross-sections with an additional layer of graphite or gold. In such a way the sample surfaces were not damaged and the samples could be used in further investigations utilising different techniques. Qualitative and quantitative elemental analysis of selected areas of samples was carried out using energy dispersive X-ray spectrometry (EDS, Oxford Instruments, Great Britain) using the Oxford INCA software.

Fourier Transform Infrared Microscopy

In investigations using infra-red spectroscopy, samples were placed in a Specac GS02550 Diasqueese Plus Diamond Compression Cell. Infra-red spectra were recorded using a

PerkinElmer FTIR spectrometer Spectrum GX with an AutoIMAGE FTIR microscope.

¹⁶ Electronic scanning microscopy was performed at the Slovenian National Building and Civil Engineering Institute in collaboration with Dr. Andrijana Sever Škapič.

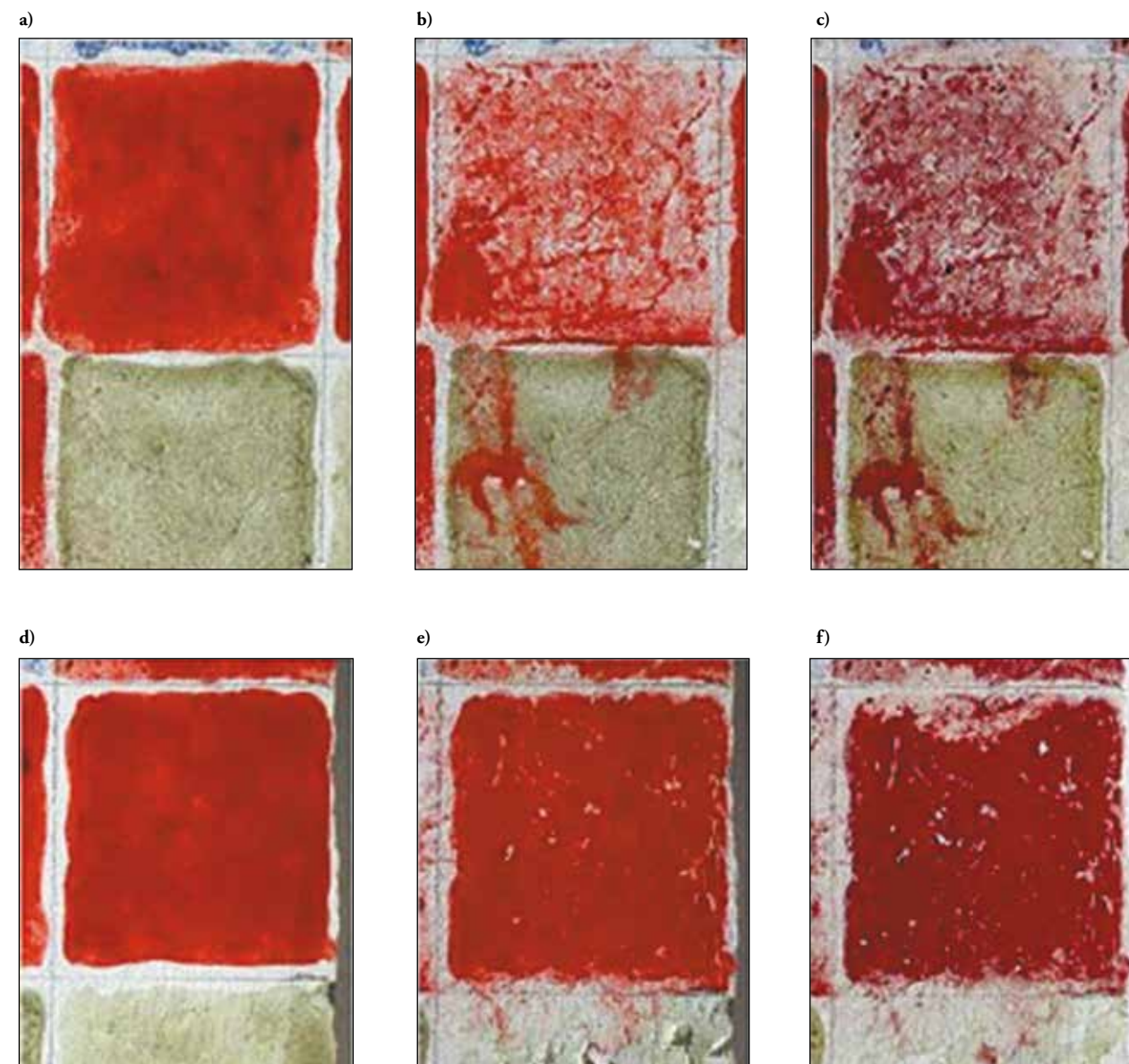


Figure 2: Effect of temperature fluctuations, relative humidity and UV-VIS radiation on the colour layers of cinnabar in combination with Klucel EF and Tylose MH: a) Klucel EF – cinnabar before exposure, b) Klucel EF – cinnabar after effect of T, RH, c) Klucel EF – cinnabar after effect of UV-VIS radiation, d) Tylose MH – cinnabar before exposure, e) Tylose MH – cinnabar after effect of T, RH, f) Tylose MH – cinnabar after effect of UV-VIS radiation.

Results and discussion

Visual overview of colour layers treated in climatic chambers

After exposing prepared samples of colour layers on lime plaster to the conditions in the two chambers as described in the method in chapter: *Conditions in the climatic chambers*, the most obvious visual changes could be seen in the colour layers prepared with Klucel EF binder in combination with pigments cinnabar (figure 2) and smalt (figure 3). As can be seen in figure 2.b, when the cinnabar colour layer in combination with Klucel EF was exposed to fluctuations in temperature and relative humidity, it ran along the surface of the model wall painting. During the exposure of the samples to the conditions in this chamber, condensed water

obviously collected on the surface of the model wall painting and since Klucel EF is a water-soluble cellulose ether, the colour layer prepared with this binder did not withstand the conditions. Conversely, the colour layer prepared with the Tylose MH binder, which also belongs to the water-soluble cellulose ethers, displayed only minor changes, which can be seen in figure 2e.

The different behaviour of the two cellulose ethers can be ascribed to the differences in the viscosity of the prepared binders. After exposure to UV-VIS radiation, a darkening of cinnabar occurred in both examples of colour layers prepared with cellulose ethers (figure 2c and 2f). Such darkening of cinnabar is known to occur after exposure to light in the wavelength range of 400 to 570 nm.

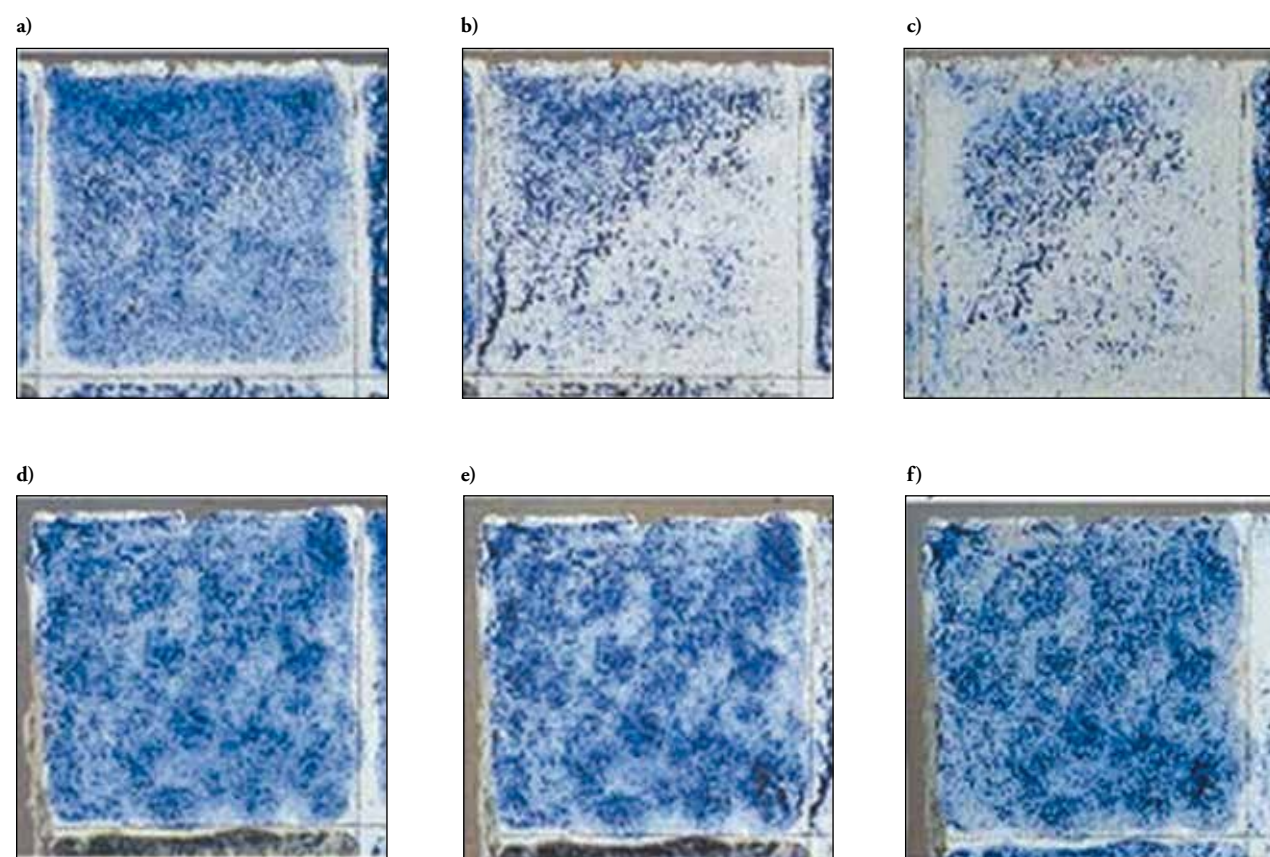


Figure 3: Effect of temperature fluctuations, relative humidity and UV-VIS radiation on the colour layers of smalt in combination with Klucel EF and Tylose MH: a) Klucel EF – smalt before exposure, b) Klucel EF – smalt after effect of T, RH, c) Klucel EF – smalt after effect of UV-VIS radiation, d) Tylose MH – smalt before exposure, e) Tylose MH – smalt after effect of T, RH, f) Tylose MH – smalt after effect of UV-VIS.

Figure 3b and 3c show a discoloration of the colour layer of smalt in combination with Klucel EF binder after treatment in both chambers. The Tylose MH colour layer in combination with smalt does not show any visual changes (figure 3e, 3f). None of the cellulose ethers showed any changes in combination with green earth.

The colour layers prepared with ammonium caseinate, Primal AC33 and Paraloid B-72 did not display visual changes with any of the used pigments.

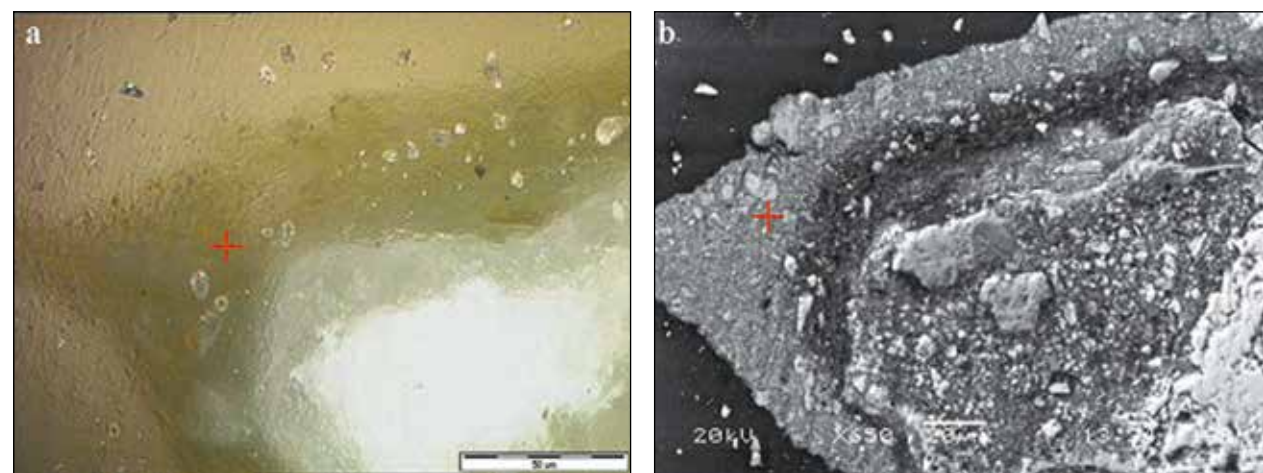


Figure 4: Image of cross-section of a colour layer with the green earth pigment and binder Primal AC33 on lime plaster at 650x (for an image of 12.8 x 9.6 cm) magnification with a) optic and b) scanning electron microscopy. The red denotes the area for further investigation at 5000x magnification.

Effect of treatment in chambers on the micro-structure of colour layers

The micro-structure of the colour layers was examined by using optical microscopy of cross-sections of binder samples combined with green earth. Colour layers combined with this pigment were selected to investigate different binders because green earth is known to be a stable pigment in all combinations, and indeed no visual changes could be seen in the colour layers prepared with this pigment after being exposed to conditions in the chambers in combination with any of the investigated binders. In such a way the causes for the changes in the micro-structure of colour layers due to an unstable pigment were excluded, thus enabling investigations to concentrate on the changes in the micro-structure only in relation to the choice of binder.

Under 650x magnification or less, which was made possible by using an optical microscope, no changes in the micro-structure of the colour layers in any of the used binders were noted, so optical microscopy was used only for the location of sample areas which were then examined using scanning electron microscopy (figure 4a and 4b).

Investigations of the micro-structures of colour layers were carried out under a magnification of 5000x using scanning electron microscopy. The colour layers of green earth in combination with Primal AC33 and Paraloid B-72 showed changes in their micro-structure after treatments in both chambers. The colour layer of Primal AC33 shows a certain micro-structure before exposure (figure 5a). Under the influence of fluctuations of temperature and relative humidity it loses this structure, since it is evident (figure 5b) that this structure becomes smoother (figure 5b). When exposed to UV-VIS radiation, the micro-structure is subject to further changes. The most undesired change is the appearance of micro cracks of one to two micro-metres in length (figure 5c). Exposing Paraloid B-72 to the conditions in the chambers had the opposite effect on the colour layers. After treatment in the temperature and relative humidity chamber, micro cracks appeared in the micro-structure, and became smooth again under the influence of UV-VIS radiation.

Both acrylic binders are methyl acrylate and ethyl methacrylate copolymers, although Primal AC33 has a higher molecular weight. It is possible that the commercial product of Primal AC33, which is produced from Paraloid B-72, contains additives that have an effect on the degradation processes.

Figure 6a shows a colour layer with Klucel EF before treatment in the chambers. A horizontal crack occurred on the border of the colour layer with the lime plaster

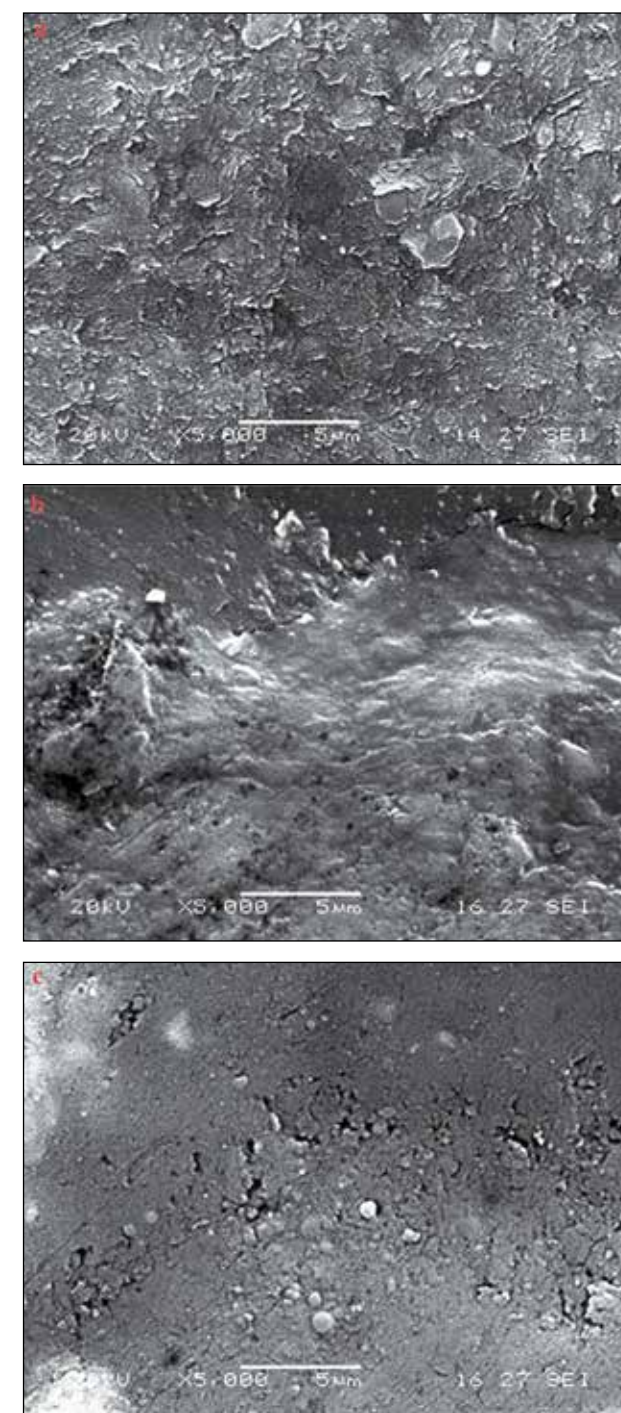


Figure 5: Scanning electron micrograph of the colour layer with Primal AC33: a) before exposure, b) after treatment in the T, RH chamber, and c) after treatment in the UV-VIS chamber.

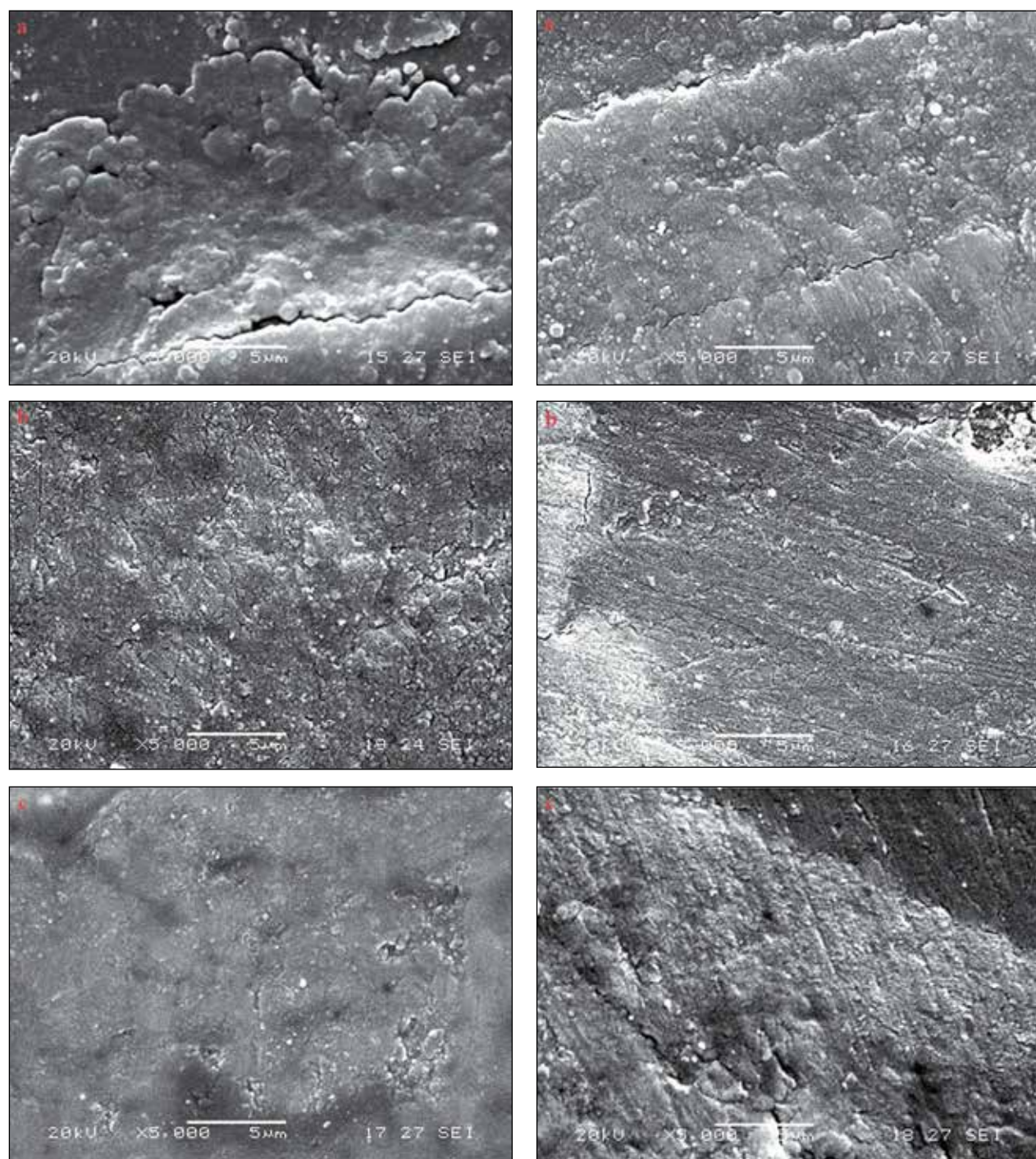


Figure 6: Scanning electron micrograph of the colour layer with Klucel EF: a) before exposure, b) after treatment in the T, RH chamber, and c) after treatment in the UV-VIS chamber.

Figure 7: Scanning electron micrograph of the colour layer with ammonium caseinate: a) before exposure, b) after treatment in the T, RH chamber, and c) after treatment in the UV-VIS chamber.

underneath. After exposure to the conditions in the temperature and relative humidity chamber, the micro-structure of the colour layer changed drastically (figure 6b) and micro cracks became noticeable. When exposed to the effects of UV-VIS radiation, the colour layer again totally changed in its micro-structure (figure 6c).

The colour layer of ammonium caseinate showed cracks after being exposed to fluctuations of temperature and relative humidity. Some of the cracks were as long as 3 μm (figure 7b). After treatment in the UV-VIS chamber, differences could hardly be discerned in comparison with the condition after the influence of fluctuations of temperature and relative humidity (compare figure 7b and 7c). The results for Tylose MH showed the least effect on the colour layers subjected to the conditions in the chambers, since there were hardly any changes in its micro-structure.

Effect of conditions in chambers on the chemical structure of the binder

To investigate the changes in the chemical structure of binders due to the effect of fluctuations of temperature, relative humidity and UV radiation, pure binders mounted on glass slides were examined using FTIR microscopy (chapter: *Definition of retouching binders - Preparation of samples*). The samples were examined before exposure, separately after treatment in each chamber, and samples that were exposed to the conditions of both chambers. Results are collected in Tables 1-5.

As can be seen in figure 8 and table 1, UV-VIS radiation had the greatest effect on the chemical structure of Klucel EF. A strong new absorption band appeared at 1726 cm^{-1} , typical for C = O stretching vibration of carbonyl group. It is likely that the formation of a product which contains a carbonyl group in its structure occurs under the influence of UV-VIS radiation. According to research on thermal degradation of unstable cellulose ethers, which occurs in a series of reactions¹⁷, the formation of products that contain carbonyl groups also occurs. Klucel EF has a molar substitution of 3.8, and belongs to the group of thermally unstable cellulose ethers, since the tendency for the formation of peroxides is greater in longer alkyl groups. It is likely that Klucel EF is subject to similar reactions of peroxidation and further auto-oxidation, also under the influence of UV-VIS

radiation. The degradation of the binder is also indicated by a complete change in the micro-structure of the Klucel EF colour layer (figure 6c) after exposure to UV-VIS radiation. Comparing results with the sample treated in both chambers is interesting, since the absorption band at 1735 cm^{-1} is much smaller (figure 8), which corresponds with investigations on the effect of high relative humidity on various cellulose ethers, which should prevent peroxidation.

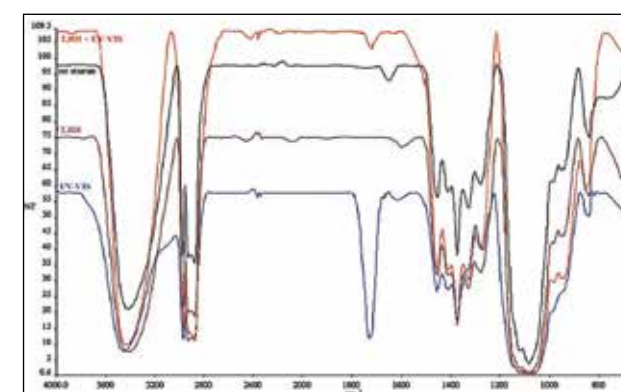


Figure 8: FTIR spectra of Klucel EF before and after exposure to conditions in chambers.

Table 1: Klucel EF absorption bands (cm^{-1}) before and after exposure to conditions in the chambers. Key: vs-very strong, sb-strong broadened, s-strong, m-medium, w-weak, vw-very weak, wb-weak broadened.

Before ageing	After T, RH chamber	After UV-VIS chamber	After T, RH + UV-VIS chambers
3420 sb	3413 sb	3450 sb	3436 sb
2973 s	2973 s	2973 s	2972 s
2926 s	2926 s	2933 s	2926 s
2880 s	2880 s	2878 s	2878 s
		1726 s	1735 w
1646 wb	1600 wb	1624 w	1643 vw
1457 m	1455 m	1459 m	1458 m
1413 m	1410 m	1410 m	1412 m
1375 s	1375 s	1376 s	1375 s
1331 m	1330 m	1329 m	1330 m
1281 m	1278 m	1273 m	1280 m
1122 vs	1122 vs	1124 vs	1122 vs
1085 vs	1083 vs	1080 vs	1079 vs
983 m	983 m	986 m	986 m
945 m	946 m	957 m	955 m
841 m	842 m	854 m	853 m

¹⁷ FELLER, WILT 1990; KOZ'MINA 1968, pp. 4225-4240; KOZLOV, KOZ'MINA, PLISKO, DANILOV 1963, pp. 1089-1093; KOZ'MINA, KURLYANKINA, ZHADAN PUSHKINA, MOLOTKOV 1963, pp. 1160-1164.

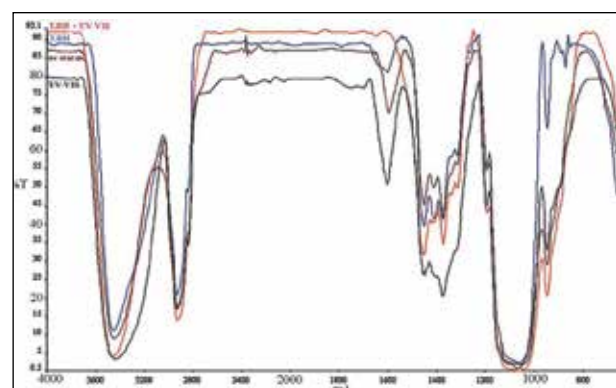


Figure 9: FTIR spectra of Tylose MH before and after exposure to conditions in chambers.

Table 2: Tylose MH absorption bands (cm⁻¹) before and after exposure to conditions in the chambers. Key: vs-very strong, sb-strong broadened, s-strong, m-medium, w-weak, vw-very weak, wb-weak broadened.

Before ageing	After T, RH chamber	After UV-VIS chamber	After T, RH + UV-VIS chambers
3452 sb	3454 sb	3432 sb	3452 sb
2931 s	2934 s	2936 s	2932 s
1596 m	1600 wb	1603 m	
1453 m	1454 m	1450 m	1459 m
1413 m	1412 m	1405 m	1413 m
1373 s	1376 m	1375 s	1375 m
1313 m	1314 m	1316 m	1313 m
1193 m	1197 m	1198 m	1193 m
1114 vs	1117 vs	1119 vs	1117 vs
1071 vs	1060 vs	1054 vs	1061 vs
950 m	949 m	949 m	949 m

An absorption band of ca. 1720 cm⁻¹ (figure 9, table 2) does not occur in the FTIR spectra of Tylose MH after the effects of UV-VIS radiation, therefore not indicating the process of degradation and formation of new carbonyl groups in the molecule. Tylose MH is a methyl hydroxy ethyl cellulose. Cellulose ethers which are substituted with short alkyl groups, such as the methyl group, are thermally stable, since there is much less of a tendency for peroxide formation to occur in short alkyl groups. From the results obtained with FTIR spectroscopy it can be deduced that they are stable also under the influence of UV-VIS radiation. The only change in the FTIR spectra is the decrease of the intensity of the absorption band at 1600 cm⁻¹ after treatment in the chamber for changing temperature and relative humidity, and after treatment in both chambers. Since in this area there are no absorption bands in this range that would correspond to the structure itself, it can be concluded that the commercial product Tylose MH contains an additive that is affected by fluctuations of temperature and relative humidity. Ammonium caseinate shows changes in FTIR spectra after treatment in all chambers (figure 10, table 3). Broadening of absorption bands at 1655 and 1539 cm⁻¹, and the appearance of new absorption bands in the range from 1078 to 1170 cm⁻¹ in the spectra of all exposed samples, suggests the splitting of peptide bonds, which connect the amino acids into a caseine structure. Since the tem-

perature in the chambers did not exceed 50°C, the splitting of the peptide bonds occurred under the influence of high relative humidity, since it rose up to 90% in a cycle in the chamber, and under the influence of UV radiation in the other chamber.

The splitting of peptide bonds did not occur completely, given that absorption bands typical for an amid group, although broadened, are still present in the spectra. At 1655 cm⁻¹, in the sample not exposed to the conditions in the chambers, there was a very strong C = O stretching vibration (amid I), at 1539 cm⁻¹ strong C – N stretching vibration in combination with C – N – H in plane stretch bending vibration (amid II), and medium strong stretch-open mode at 1248 cm⁻¹ (amid III).¹⁸

After exposure to the conditions in the chambers, the broadening and displacement of the amid I and amid II bands (table 4) was also noted, which is a result of the changes in the chemical environment of the amid groups, where a bond between two amino acids is being split in close proximity. In hydrolysis of peptide bonds, free end – COOH and –NH₂ groups are produced in the protein molecule. –NH₂ scissors deformation, which is very prominent in the region between 1627 and 1590 cm⁻¹ in primary aliphatic amines, additionally contributes to the broadening of the amid I band at ca. 1650 cm⁻¹. C = O stretching vibration of carboxylic acid also adds to the broadening of the band, which is usually present between 1740 and 1660 cm⁻¹.

NH₂ asymmetrical (3380 – 3350 cm⁻¹) as well as symmetrical (3310 – 3280 cm⁻¹) vibrations of produced primary amine structures contribute to the broadening of the band at ca. 3300 cm⁻¹ in the exposed samples, which is typical for NH stretching vibration of amides.

OH stretching vibration of the produced carboxyl end is present at ca. 3000 cm⁻¹. The appearance of new absorption bands in the area between 1170 and 1078 cm⁻¹ can be ascribed to skeletal vibrations. For primary amine CH – NH₂ structures, the following absorptions are typical: 1180-1170 cm⁻¹, 1163-1153 cm⁻¹, 1143-1130 cm⁻¹, 1040-1000 cm⁻¹. C – N stretching mode is probably included in all these vibrations.

¹⁸ LIN VIEN, COLTHUP, FATELEY, GRASSELLI 1991, which is valid for the following three paragraphs.

Table 3: Ammonium caseinate absorption bands (cm⁻¹) before and after exposure to conditions in the chambers. Key: vs-very strong, vsb-very strong broadened, sb-strong broadened, s-strong, m-medium, w-weak.

Before ageing	After T, RH chamber	After UV-VIS chamber	After T, RH + UV-VIS chambers
3311 sb	3285 sb	3294 sb	3302 vsb
3075 m	3063 s	3068 s	3063 s
2973 m	2962 s	2962 s	2962 s
	2931 m	2926 m	2936 s
			1672 vsb
1655 vs	1650 vsb	1649 vsb	1665 vsb
1539 s	1543 vsb	1535 vsb	1532 vsb
1456 m	1448 s	1451 s	1450 s
1405 w	1403 s	1392 w	1397 s
1345 w	1352 w		
1248 m	1248 w	1236 m	1237 m
	1151 w	1170 m	1170 m
	1117 m		
	1103 m	1078 m	1087 m

Table 4: Primal AC33 absorption bands (cm⁻¹) before and after exposure to conditions in the chambers. Key: vs-very strong, s-strong, m-medium, w-weak, vw-very weak.

Before ageing	After T, RH chamber	After UV-VIS chamber	After T, RH + UV-VIS chambers
2959 vs	2959 vs	2958 vs	2958 vs
2876 m	2875 m	2876 m	2875 m
1733 vs	1732 vs	1735 vs	1728 vs
1450 s	1451 s	1451 s	1451 s
1386 m	1386 m	1388 m	1386 m
1358 m	1352 m	1350 m	
1240 s	1240 s	1240 s	1239 s
1169 vs	1167 vs	1167 vs	1166 vs
1148 vs	1148 vs	1148 vs	1148 vs
1064 m	1069 m	1064 m	1067 m
1025 w	1024 w	1020 w	1028 w
991 w	989 w	986 w	992 w
962 w	942 w	963 w	965 vw
843 m	843 m	844 m	844 m
755 w	755 w	755 w	752 w

Table 5: Paraloid B-72 absorption bands (cm⁻¹) before and after exposure to conditions in the chambers. Key: vs-very strong, s-strong, m-medium, w-weak.

Before ageing	After T, RH chamber	After UV-VIS chamber	After T, RH + UV-VIS chambers
2990 vs	2988 vs	2986 vs	2984 vs
2955 s	2955 s	2954 s	2953 s
1729 vs	1725 vs	1730 vs	1727 vs
1472 s	1473 s	1473 s	1473 s
1448 s	1448 s	1449 s	1448 s
1378 s	1387 s	1388 s	1387 s
1368 m	1368 m	1368 m	1365 m
1266 s	1268 s	1263 s	1263 s
1239 s	1237 s	1236 s	1237 s
1172 vs	1172 vs	1163 vs	1161 vs
1148 vs	1148 vs	1148 vs	1147 vs
1029 s	1027 s	1027 s	1026 s
971 w	971 w	970 w	970 w
861 m	861 m	861 m	860 m
838 w			
756 m	756 m	755 m	755 m

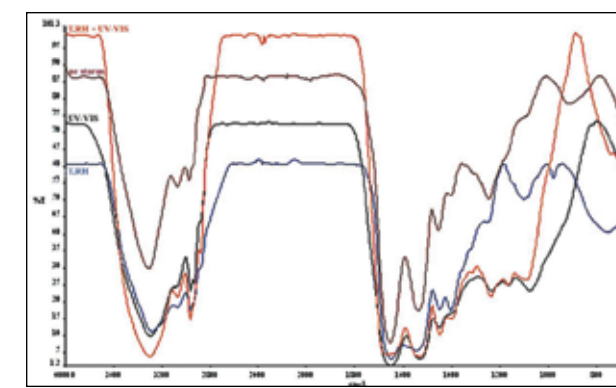


Figure 10: FTIR spectra of ammonium caseinate before and after exposure to conditions in chambers

Despite the fact that the exposed colour layers containing ammonium caseinate do not show any typical yellowing, it can be concluded from the analysed FTIR spectra that ammonium caseinate is not a suitable binder for use in painting since the illustrated degradation of peptide bonds serves as evidence of the degradation of the binder.

Primal AC33 and Paraloid B-72 showed practically no changes in their FTIR spectra after treatment in the chambers (tables 4 and 5). The appearance of micro cracks in their micro structure was probably a consequence of a polymer chain splitting, and hence the lowering of the molecular weight, which, however, cannot be seen in the FTIR spectra. If results of both polymers are compared (tables 4 and 5) small differences can be discerned in the wavenumbers of the absorption bands, which is probably the result of one or more additives in the commercial manufacture of Primal AC33.

Considering investigation results in exposing samples of binders to fluctuations of temperature, relative humidity and UV-VIS radiation, Tylose MH was chosen as the re-touch binder, since it showed practically no changes, despite the exceptional conditions in the chambers. Tylose MH also corresponds to the demand for reversibility of retouched areas, since it is water-soluble and easily removable.

Report on the initial cleaning and consolidation procedures

Marta Bensa

KEY WORDS:

casein, sulphatisation, preliminary studies, the cleaning of wall paintings, ammonium bicarbonate, ethyl silicate

ABSTRACT

The wall and ceiling paintings in the central nave of Ljubljana Cathedral have been restored a number of times in the past. Restoration treatments were necessary due to changes that had occurred as a result of subsidence, damp and internal pollution. These harmful effects resulted in cracks, the migration of soluble salts and the settling of dirt of various kinds. The paintings were first restored in the mid-19th century. Another restoration treatment in 1906 was led by Anton Jebačič, who cleaned the paintings with soapy water and retouched them with oils and wax paints. The last documented restoration was carried out between 1959 and 1961 by Peter Železnik.¹

Preliminary macroscopic and microscopic analyses showed that the entire painting surface had darkened completely, something that has not been observed with Quaglio's other works². Analysis with an optical microscope, brought to the site itself, additionally revealed that the material had "worn out" and was now covered with small funnel shaped indentations, most likely caused by considerable sulphatisation.

PRELIMINARY RESEARCH AND THE CONDITION OF THE WALL PAINTINGS

Prior to the restoration treatment we carried out preliminary diagnostic research in order to determine the reasons for the poor condition of the painting and the various problems connected with its deterioration. On the basis of this we decided on the most suitable materials and methodology for the execution of the conservation-restoration work. The preliminary research focused on the study of the painting technique and the nature of the various changes that had occurred due to the interaction between the previous restoration treatments and pollutants in the air.

Using thermography, we were able to immediately determine the areas where condensation and dampness occurred most frequently, in particular the sections very close to the bell towers by the entrance. Under ultraviolet light, the inconsistency of colours, which we later ascribed to the subsequently added materials, became apparent. On the basis of these assumptions, we twice carried out an analysis by taking samples (on 20 November 2003 and 6 January 2004) in order to study the painting technique and the nature of the substances that had caused the changes. In parallel with this, Wishab sponges were used to clean the surface, resulting in a thinner deposit of accumulated dust and soot.

Sample taken on 20 November 2003³

During this phase, one sample was taken and on the basis of the result we determined the nature of the substances that had caused the colour changes on the painting surface. The analysis of the sample revealed the presence of phosphorus, which was most probably a constituent component of the protective coatings based on casein (the presence of phosphorus in the sample was 0.46 percent).⁴

³ ROPRET, 20 November 2003.

⁴ Analysis by ROPRET, 20 November 2003, showed that some sections were thickly covered with casein, which had penetrated the plasterwork. We are assuming that this layer was applied with the aim of consolidation and protection during one of the previous restoration treatments.



Figure 1: Quadrant G12, 13 – the darkened surface with the marked rectangular stains on the architectural background above the spot corresponding to the position of bricks in the nave vault.

Samples taken on 6 January 2004⁵

On the basis of an analysis of 14 samples, we determined the condition of the colour layers and the painting technique. Research showed that the pigments were mixed with carbonated lime, which confirms that most of the painting was done in the fresco technique, while the *giornate* were visible to the naked eye. On some areas, a semi-fresco (*mezzo fresco*) technique was used, especially in the treatment of detail.⁶ The choice of pigments was determined on the basis of the painter's palette and art manuals of the time:⁷ the blue of

the sky was created on the basis of smalt, the unified yellow of the figures from yellow ochre, the colour of the clouds on the basis of caput mortuum and black coal, the architectural purple background was also from caput mortuum, the skin colour is from ochre and green earth, lips from cinnabar, the reds in the clothes of the figures are mostly from red ochre, the unified green colour of the four medallions is from green earth, and for the flower compositions ochre and umber were used.⁸ In the sections where the plaster and the paint were particularly damaged, corrections and overpainting could be seen with the naked eye and were confirmed by chemical analyses. Sulphatisation was very wide-spread, being found in all the samples, with the range of the concentration of sulphates between 3 and 0.9 percent.⁹

⁵ ROPRET, 6 January 2004.

⁶ In the 17th and 18th century a technique was used called *semi-fresco*, called also *painting on lime* (*pittura a calce*) or *painting on lime white-wash* (*pittura a bianco di calce*). Pigments were dissolved in calcium hydroxide and applied either on fresh or dry plaster. The durability of the painting is provided by calcium hydroxide, which is used as a binder, and its carbonisation. Because of the pigments binding with calcium hydroxide, the technique acquires the appearance of a tempera painting. RENZONI 1997, p. 30. Some analytical studies show two layers of carbonisation, ROPRET, 6 January 2004.

⁷ Andrea Pozzo, *Breve istruzione del dipingere a fresco*, 1758, in MORA P., MORA L., PHILIPOT 1977, pp. 443–449. A characteristic of most of the pigments used by the artist in this cycle is that they remain stable even in contact with calcium hydroxide.

⁸ ROPRET, 6 January 2004.

⁹ ROPRET, 6 January 2004. The analysed pigments of the overpainting are: Prussian blue, barium sulphate, zinc white, red iron oxide, lead white or lead red, organic red pigment.

¹ SITAR 2004–2006 a. In a document from 1859 it is stated that the first restoration treatment, probably led by Langus, was performed in such a "barbaric" way that Quaglio's artistic sensitivity disappeared completely and the three-dimensionality of the architectural background was also lost. Archive documents show that, prior to our restoration treatment, four others had been carried out, but only three of them can be linked to the nave.

² Here we are referring in particular to the well-preserved painting cycles by Quaglio closest to the period of the painting of the nave vault in Ljubljana. Among these other works are: *frescoes in the hall and salon*, 1693, the Strassoldo Palace, Udine; *frescoes in Cappella della Pietà*, 1694, the town pawnshop, Udine; *frescoes in the atrium, the staircase and the salon*, 1697–1698, Antonini Belgrado Palace – the main administrative building of the Udine region, Udine; *frescoes depicting the Deposition from the Cross, Cappella*, 1706, Puštal Castle, Škofja Loka; BERGAMINI 1994.



Figure 2: Quadrant O22 - the darkened micro-cracks on the picture's plaster prior to cleaning.



Figure 3: Quadrant O22 - after cleaning and retouching.

On the basis of the main preliminary studies we established different reasons for the deterioration.

a) The presence of a protein-based substance (casein) was found on the entire surface, which was most likely applied during one of the previous restoration treatments in order to consolidate and protect the painting.

b) A thick layer of dirt from smoke and soot was concentrated at different levels on the layer of casein and was partially absorbed into it.

c) Extensive sulphatisation, present in all the samples, which started in the topmost layers and gradually penetrated the deeper layers of the painting. This phenomenon can possibly be attributed to increased pollution between 1980 and 1990.

d) Extensive peeling and pulverisation of the layers of paint due to damp in the past, especially visible near the two bell towers at the main entrance. The condition of the first lunette in the north-east was so critical that we had to carry out emergency consolidation and pre-consolidation.

e) Sulphate efflorescence on certain parts of the wall and the peeling of the paint due to the migration of soluble salts. Rectangular stains on the purple architectural perspective background corresponded with the shape of bricks prior to the painting of the architectonic structure. The most likely reason for this is harmful substances in the bricks themselves (figure 1).

f) Paints made on the basis of green earth were the ones peeling most and the most likely reason for this is the application of paints containing an insufficient quantity of binder.¹⁰

THE TESTING OF CLEANING METHODS

On the basis of the gathered information, we carried out the first tests aimed at establishing a cleaning method with

which we could solve two problems: to eliminate as much of the casein as possible, as it was obscuring the real appearance of the painting, and then to remove the sulphatisation that had spread mainly from the surface inwards. Below are the results of the sampling for analytical monitoring of the cleaning significant for deciding on the most suitable methodology with respect to practical application.¹¹

Sampling on 8 January 2004¹²

The most important procedures on a matrix of quadrants 10 x 10 cm were carried out in the following sections:

- J14, the yellow background of the sky, yellow ochre pigment,
 - K18, purple background of the architecture, pigment with caput mortuum
 - E16, dark grey architectural section, black coal pigment.
- Reagents:
- demineralised water,
 - ammonium bicarbonate 10 g/l,
 - ion exchange resins (desulphatised resins),
 - barium hydroxide 10 g/l.

For the application of these we used a system of compresses with various supports and with an initial insertion of Japanese restoration paper:

- Arbocel 1000 and 200 for compresses with demineralised water,
- Arbocel 1000, 200 and Sepiolit or Carbogel¹³ for bicarbonate compresses,

¹¹ FERRONI 1982, p. 265; PERUSINI 1985; BOTTICELLI 1992; MATTEINI 1999, pp. 48–84; BOTTICELLI 1999, pp. 109–143.

I would like to thank the restorer Jürgen Pursche for his visit, which was crucial in the choice of methodology as he carried out a few attempts of cleaning using ammonium carbonate and ion (anion) exchange resins, and provided us with invaluable suggestions and advice.

¹² ROPRET, 8 January 2004.

¹³ BORGIOLO, GIOVANNONI F., GIOVANNONI S. 2001, pp. 63–68.

¹⁰ Even from the stratigraphic analyses: ROPRET, 6 January 2004, p. 56, SNL 141, a discontinuity of the lime base is obvious, while the presence of protein binder was excluded.



Figure 4: Quadrant N18 - the cleaned test surface, measuring approximately 20 x 20 centimetres. There is a noticeable difference in the colour before and after the treatment.

- a mixture of water and resin for compresses with desulphatised resins,
- Arbocel 1000 in 200 for compresses with barium hydroxide.

The duration of applications was:

- 30 minutes for water compresses,
- 30 minutes, 1 hour and 2 hours for bicarbonate compresses,
- 30 minutes for resin compresses,
- 4 hours for compresses with barium hydroxide.

The goal of the cleaning was to selectively remove substances due to which changes had occurred, while ensuring that the binder of the vault painting was not excessively damaged. For this reason, we did not persist in excessive removal of casein in sections where the reduced binding strength of carbonated lime threatened the stability of the painted layers.

The visible results, in the areas of yellow and purple perspective background, marked as J14 and K18, confirmed by analyses, were as follows: using water, we removed only the soot that we had been unable to remove by mechanical cleaning with Wishab sponges; ion exchange resins did not satisfactorily remove the sulphates or the casein so that, once dry, the surface became patchy with stains. Good results were achieved with ammonium bicarbonate, which (after an application lasting at least an hour) almost completely removed the sulphates and softened the casein so that it was possible to remove it with damp cotton wool or

natural sea sponges, without damaging the thin colour layer. The consolidation procedure using barium hydroxide was excluded as we decided it would not play an important role in this. No fading of colour occurred on any of the surfaces tested.¹⁴

In section E16 – the grey architectural section – we halved the time of bicarbonate application as in tests with this reagent we had established that after the final drying out a slight fading of colours occurred. It was interesting that within the same timescale – 30 minutes – both the bicarbonate and the resins removed the sulphates equally well, but the resins did not remove the casein quite as well. As due to the properties of resins it is difficult to keep the wet substance on a wet base for more than 30 minutes, we excluded resin compresses and decided on compresses using reagents such as ammonium carbonate and bicarbonate¹⁵ (figures 2 and 3).

A different approach was chosen for the sections on green surfaces, where it was necessary to exclude all procedures using reagents. After three different attempts at trying to pre-consolidate the surface of a green medallion (quadrant H11), the entire surface faded completely after 10 minute-applications using ion exchange resins, ammonium bicarbonate and barium hydroxide (5 g/l).¹⁶

On the basis of the collected data we decided on sample cleaning with a compress of 10% ammonium bicarbonate and Arbocel 1000 and 200 cellulose pulp (because of difficulties on application we excluded Carbogel). The cleaning was carried out on a sample area on the architectural background measuring 20 x 20 centimetres and in a small part of one of the figures, in order to be able to assess more precisely what the aesthetic effect of the chosen procedure would be. After an hour we removed the compress and then wiped off the casein and dirt with damp cotton wool in order to

¹⁴ ROPRET, 8 January 2004, pp. 38–53 for J14 section samples SNL 155a, 153, 155, 156, pp. 23–37 for K18 section samples SNL 158, 152, 159, 160.

¹⁵ ROPRET, 8 January 2004, pp. 57–67, samples SNL 161, 162, 163.

¹⁶ It is possible that the painter himself used a small amount of lime when painting in order to achieve a darker, more velvety tone which, however, disappeared completely due to sulphatisation. For a temporary protection of border areas during the application of ammonium compresses in these cases we used Cyclododecan dissolved in white spirit (figure 7). During the attempts at consolidation the surface by using 3% Klucel and alcohol, carried out with a prior application of two layers of Japanese restoration paper, we achieved fairly good results. We continued the procedure with gentle rinses through Japanese paper with water and natural sea sponges, and when the surface was completely dry, we applied a thin layer of ethyl silicate.



Figure 5: Quadrant N18 – a magnification of figure 4 –above the scalp: it was possible to almost completely remove the darkened casein coating from the original support after the application of compresses with ammonium carbonate.



Figure 6: Quadrant F3 – the condition of some of the worst damaged sections of the painting in the vicinity of the north-western bell tower.



Figure 7: Quadrant J21 – temporary protection of the edges of damaged areas on green sections using Cyclododecan prior to cleaning with compresses.

check whether the colour had faded. Let us stress that the painting here was well preserved, which made the procedure easier and facilitated a greater measure of control. We were very pleased with the results, especially with regard to the purple colour, which regained the glow we have observed in other well-preserved wall paintings by Quaglio (figures 4 and 5). We then increased the testing area to approximately one square metre. For this, we chose section NO22, 23 and achieved equally good results (figures 2 and 3).

PRE-CONSOLIDATION AND CONSOLIDATION OF THE COLOUR LAYER

In the most damaged, although limited sections of the wall painting in the nave (the north-western part of the lunette, quadrant F3), the colour layer was peeling so badly that it was necessary to carry out pre-consolidation (figure 6). We decided on only the local use of the water emulsion of acrylic resin Primal E-330. The emulsion surplus was then removed by means of compresses with added ketone solvent. In addition, it was necessary to pre-consolidate all the green sample surfaces (figure 7) and the yellow lunettes. A thin layer of ethyl silicate in white spirit was applied with a brush so as not to saturate the porous sections of the plaster, as this would complicate the retouching procedure, while at the same time in this way we managed to avoid changes of colour hues. The quantity of the consolidate used was approximately 500 gr/m².¹⁷

CONCLUSION

Upon the completion of our work there are a number of findings we arrived at during the restoration treatment which are the result of an interdisciplinary approach. Due to the synergistic effect of different areas we obtained a great deal of historical, artistic, material and scientific data on the basis of which we were able to gain a complex overview of problems that needed to be resolved before the restoration work was carried out. This paper describes the attempts at preliminary cleaning and the necessary procedures of pre-consolidation. Initially, most problems occurred when we tried to establish the reasons for such a pronounced darkening of the painted surface. After the first sampling with different reagents and through comparison with well-preserved paintings by the same artist, we established that the surface was covered with a coating that had, in one of the previous restoration treatments, most likely been used for consolidation. Chemical analyses showed the presence of casein, which had in places penetrated deep into the colour layer. On the basis of this, our expert commission formulated a methodological approach based on aesthetic and conservation premises, the aim of which was to return this artistic work to its original beauty. We decided to remove the organic substance which no longer served its purpose and even detracted from the original image of the painting. Due to extensive sulphatisation, we had to choose a method of cleaning the painting using ammonium carbonate and bicarbonate as reagents. After the first quadrants were cleaned, the painting in the tested areas again came to life, retaining the glow it had lost a long time ago.

Final report on the cleaning

Giovanna Nevyjel, Claudia Ragazzoni

KEY WORDS:

cleaning, colour layer, plasterwork, casein, sulphatisation, ammonium carbonate

ABSTRACT

The varying degree to which the individual sections of the vault painting depicting the Apotheosis of St Nicholas, The Persecution of Christians and The Victory of the Holy Cross, painted by Giulio Quaglio on the vault of Ljubljana Cathedral, is undoubtedly also due to the large surface area involved. The condition of the painting has been worsened by the restoration treatments carried out in the past. Cleaning during the present restoration treatment was carried out using compresses with the addition of a solution based on ammonia. On the basis of preliminary testing and an analytical comparison of the results, the selected methods were adapted to the different situations as we went along. Because of a protein substance – casein – which was used during one of the previous restorations to consolidate the surface and which has penetrated deep into the plasterwork, we decided that the contact time should be greatly reduced in order to prevent the substance swelling, as otherwise white stains appeared after drying. A high concentration of salts on some of the parts of the plasterwork dictated the choice of the compress material. We decided on Japanese restoration paper, which does not allow the penetration of large volumes of water into the work of art and thus does not accelerate dangerous migrations within the plasterwork of salt pollutants which cause cracks in the paint matrix. On the most damaged sections, where the colour layer was very fragile, a consolidant was applied prior to cleaning – we used ethyl silicate so that the original would not crumble during the subsequent procedures. On sample areas that were painted with particularly sensitive pigments, we used exclusively natural sea sponges soaked in water.

The cycle of wall and ceiling paintings from the early 18th century created by Giulio Quaglio in the nave of the Cathedral of St Nicholas is one of the artist's most notable achievements. Because of their complexity and convenient location the frescoes have from the very beginning been both the subject of study and restoration treatments, which have been documented to a considerable extent. Thus we know that the work has been restored at least three times since the first half of the 19th century.¹ The clearly visible traces of restoration work on a thin layer of paint applied onto the fairly rough plaster were confirmed by the analytical studies carried out by the Restoration Centre at the Institute for the Protection of the Cultural Heritage of Slovenia. On the parts where the plasterwork and the colour layer were particularly badly damaged retouches and overpainting could clearly be seen.

On some sections, analyses² revealed a considerable quantity of casein, which was used during one of the previous restoration treatments for consolidation and which had penetrated deep into the plaster layer. The cleaning methods were chosen on the basis of these findings.

The cleaning procedure started on one of the most damaged sections: the vault close to the internal wall at the front of the church (the western wall), where the consequences of the subsidence of the architectural foundations and the leaking of rain water were obvious. Another reason for the bad condition of this section is the close proximity of the two bell towers, down which runs precipitation water, washing out harmful salts from the various materials that have been put onto the nave vault with the aim of weighting it down, and which settled particularly on the two nearby pendentives. A section of the central part of the painting, bordering on the western wall, was completely destroyed, so that during previous treatments it was replaced with new plaster with added cement mortar, which was supposed to faithfully imitate the original appearance of the architectural decoration. The colour hue of the newly applied plaster was very dark, and the overpainting carried out on the nearby original parts in order to match the subsequent overpainting

¹⁷ Consolidanti e protettivi in uso sui materiali inorganici porosi di interesse artistico ed archeologico, *Atti del Convegno, Provincia autonoma di Trento Servizio beni culturali, Trento, 25–27 febbraio 1999.*

¹ SITAR 2004–2006 a.

² ROPRET, 20 November 2003; ROPRET, 6 January 2004; ROPRET, 8 January 2004.



Figure 1: The removal of the cleaning compress: the layer of dirt that has yet not been successfully removed with water rinses using natural sea sponges is clearly visible.



Figure 2: The removal of the cleaning compress from a coat.

of the newly plastered area were clearly visible. Similar conditions were also found at the opposite end of the painting, close to the dome. On the area that makes contact with the western wall, we carried out the first sample cleaning, all the surfaces first having been thoroughly washed with natural sea sponges soaked in water. With this procedure we were able to check the durability of the paint and identify in a timely way possible problems with regard to the adhesion or cohesion of the colour layer. Based on observation of how much moisture the surfaces absorbed and dried out again we were able to identify any lack of homogeneity in the colour layer and the underlying plasterwork. In order to formulate a suitable methodology we carried out sample cleaning on small surfaces of various colours. As the reagent we used cellulose pulp and sepiolite (magnesium silicate hydrate), which were mixed with ammonium carbonate in different concentrations.

During the testing we established that it was necessary to precisely determine the reagent solution so that it did not act too aggressively on the substance which needed to be removed and which consisted of the paint used during the overpainting and most likely also of a protein strengthener such as casein. The added layer, which swelled after the application of a cleaning compress, changed into an almost transparent substance which needed to be completely removed while still damp so that it would not harden after drying and create a white film, which would stick to the original layer and then be very difficult to remove. Because of the large quantity of non-original material which penetrated inside the plasterwork, we gradually reduced the percentage of ammonium carbonate that came into contact with the surface. As we had to prevent the swelling of the whole layer and the resulting appearance of white stains after drying, we gradually removed

only those parts that had changed into the substance we were removing.

By applying compresses we identified the presence of harmful substances in the plaster, such as magnesium sulphate in the lunette close to the western wall.

With regard to the sections where the concentration of salts was highest, we discussed the possibility of using compresses with demineralised water, with which we would absorb the harmful salts, but we did not want to set in motion processes which could destroy the balance that had established itself through time, thus causing a migration of crystals, which could affect the binder used in the plaster itself. In another section, stains ran in the direction of the bricks in the wall. Similar stains can be seen on the entire surface of the fresco, even in areas we have not yet cleaned. Here, analysis revealed the excretion of chlorides³ onto the surface. We did not exclude the possibility that other substances were being excreted from the bricks in the wall, confirmed by the fact that these sections of the painting responded well to cleaning using reagents which in contact with alkaline earth salts and metals cause chelation and produce stable and water soluble solutions.⁴ The time of application was greatly reduced and paper was used as a support, as this enabled us to dampen the fresco as little as possible. We achieved very good results with this procedure as the painted layer of the architectural decorations and figures was returned to their original state in spite of the fact that we limited ourselves solely to thinning the layer of settled dirt, so that after the painting was dry there would be no white stains.

As we have already said, on the entire surface of the painting considerable sulphatisation was present, which had already

³ ROPRET, 24 May 2004.

⁴ MATTEINI, MOLES 1989, p. 133.



Figure 3: A detail from the perspective section of the painting, with clouds that have yet not been cleaned in the forefront.



Figure 4: The cleaned clouds on the sky of the right half of the perspective section of the painting.

penetrated the inner layers of plasterwork, while analyses in a number of cases proved the effectiveness of the ammonium carbonate and bicarbonate compresses, greatly reducing the percentage of calcium sulphate in the painting.

In some sections, especially on the small painted arches, a very pronounced process could be observed of the dissolving and repeated crystallisation of salts, due to which the plasterwork was decaying, while the colour layer was flaking in a number of places. On such sections, ethyl silicate was applied prior to cleaning, which enabled us to continue the procedure of applying the cleaning compresses.

It appears that the blue sky of the illusionary perspective painted near the western wall has also been restored a number of times. The reasons for these treatments were partly structural, shown by numerous deep cracks that ran along the whole apex of the vaulted ceiling. Overpainting could clearly be observed on the dark blue applications of smalt in the vicinity of the section restored with cement plaster, while the paint was probably made with the same pigment as the ultramarine blue in one of the cracks, which we identified with analysis.⁵ Analyses also exposed a high concentration of carbon, present due to the use of a binder

⁵ ROPRET, 4 June 2003.

with which additional overpainting and retouching was done, which could be seen in certain places in the shape of roughly outlined white and grey clouds. Because of the sensitivity of the applied smalt, usually consisting of fairly large grains which frequently gradually separate from the binder, we decided on a gradual cleaning process, with which we wished to thin the layer of dirt.

The high level of hygroscopy in the plasterwork was the most probable reason for the sulphatisation, which in places caused visible colour changes. As an example we could give the taking of two samples, one from the grey surface and the other from a dark stain on the same grey surface. Analyses showed that they both originated in the same layer of paint, the only difference was a different concentration of sulphur. In the first sample, there was 0.90 percent sulphur and in the second 2.76 percent.⁶

However, all the colours could not be cleaned with reagents as some of the paints that had been subsequently applied to the dry plaster displayed poor cohesive properties. This was the case in particular with red and purple sections. In these cases we limited ourselves solely to simple rinsing of the surfaces with natural sea sponges soaked in water.

⁶ ROPRET, 24 May 2004.



Figure 5: The application of Cyclododecan for the protection of the green pigment.



Figure 6: The central part of the vault painting with the image of God the Father during cleaning.

The few green paints that were used, such as, in the palm branches held by the figures, or the four monochrome medallions, are an example of an original pigment with poor cohesive properties. We found that the green pigment was made from green earth with a non-homogenous lime base and with no organic binder,⁷ which seemed to be confirmed by crystallographic analyses. Thus we approached the cleaning of the green paint with extreme caution. We decided on rinsing with natural sea sponges soaked in water. The green paint was protected with a special coating in order to temporarily isolate the paint prior to the cleaning of adjacent surfaces.

The cleaning of the painted architecture in purple, i.e. caput mortuum, was carried out gradually, as a unified effect had to be achieved on a fairly large surface, on which it was noticeable that different sections have not been equally well preserved. This applied also to numerous sections of overpainting, which could be observed with the naked eye and was in the case of the frame with a quarter profile confirmed by analyses.⁸ Moreover, we had to take into account the level of sulphatisation and the quantity of casein, which had penetrated deep into the colour layer as well as into the plasterwork and even into the rough plaster underneath (arriccio).⁹ After a series of tests, we decided to use a solution of ammonium bicarbonate as we needed a slower acting reagent than ammonium carbonate, so that we were better able to control its effects and determine more precisely the duration of contact.

The yellow sky at the highest point of the vault was cleaned in the same way, as there was a great deal of sulphatisation and analyses showed that it had spread from the surface into the plasterwork itself. This section, painted in a rich array of

yellow ochre hues, was covered by a layer of thick and unevenly settled dirt, which was spoiling the appearance of the painting to such an extent that it destroyed the depth of the perspective illusion. We intervened in the original state of the colour layer gradually and with the assistance of analyses carried out during the preliminary sample cleaning prior to our restoration treatment.¹⁰

With the exception of sections with a very fragile layer of paint, all the other surfaces were cleaned exclusively with water. These sections include: the orange garlands, the orange frames surrounding the green medallions and the brown frame surrounding the central part of the illusionary section of the painting. Because of the sensitivity of these sections, where lengthy contact with reagents and water resulted in the appearance of white stains, as well as because of the fairly well preserved pigments, we judged that a satisfactory level of cleaning had been achieved with only mechanical cleaning using Wishap sponges and, in order to achieve a unified surface, limited ourselves to rinsing them with water.

⁷ ROPRET, 24 May 2004.

⁸ ROPRET, 6 January 2004.

⁹ ROPRET, 6 January 2004; ROPRET, 8 January 2004.

¹⁰ ROPRET, 6 January 2004; ROPRET, 8 January 2004.

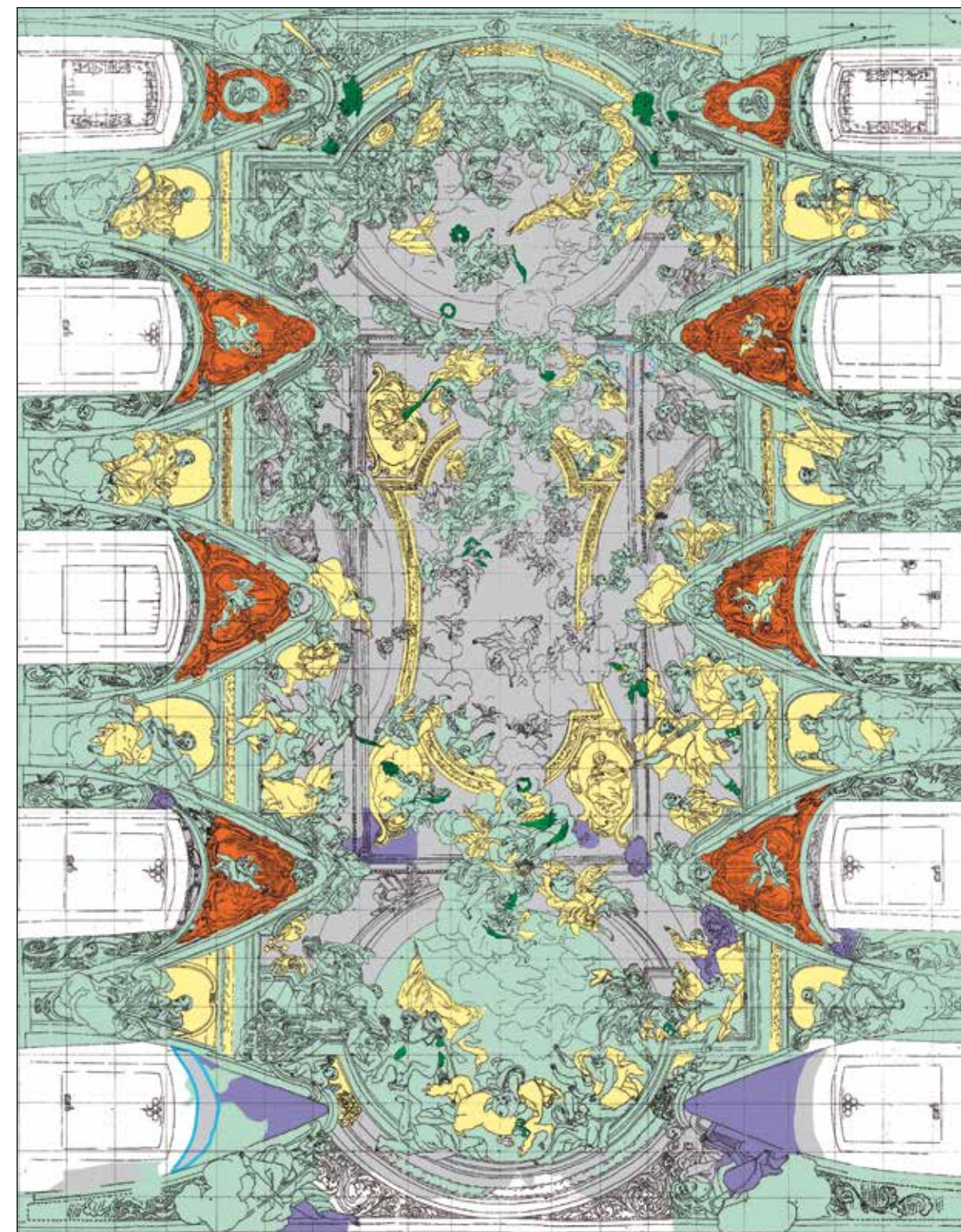


Figure 7: A graphic with a detailed description of the cleaning stages

- Cleaning using compresses saturated with a solution of ammonium salts
- Cleaning using compresses saturated with a solution of ammonium salts and the removal of the remnants of acrylic resin using acetone
- Cleaning using compresses saturated with a solution of ammonium salts and complex compounds
- Cleaning using compresses saturated with a solution of surfactants
- Cleaning using compresses saturated with a solution of ammonium salts after ethyl silicate had been applied
- Rinsing with water
- Application of Cyclododecan

The use of chemical analyses results in retouching

Rado Zoubek

KEY WORDS:

fresco, secco technique, pigments, carbonisation, binder, calcium hydroxide, Tylose

ABSTRACT

The wall paintings, which revealed numerous damaged areas after all unoriginal layers in the form of impurities and overpaints were removed, can to a large extent be restored to their initial image by skilled and precise retouching. The damaged and missing parts of the colour layers and plasterwork are most aptly replaced by those materials and techniques which were used in the actual production of the wall and ceiling paintings. Due to the special and unrepeatable process of binding pigments onto the moist surface of lime plaster during the process of painting, any later additions of applications of paint onto missing or damaged parts require the use of a binder which attaches the pigments firmly onto the surface of the wall and ceiling paintings.

Filling in the missing particles of the colour layer with pigments which would be bound with a lime binder would have been most appropriate in terms of technology, although this would have proven an extremely arduous and time-consuming task due to the thousands of tiny damaged areas.

The choice of binder, which together with appropriate pigments replaces the missing original particles of the wall painting, is a demanding and above all responsible task, which restorers come up against time after time, repeatedly searching for the most suitable solutions.

In the case of the painted vault and western wall of the Cathedral of St Nicholas in Ljubljana, the mural was from the onset planned to be executed on a lime-brick support, which is most suitable for the execution of wall and ceiling paintings onto fresh plaster.¹ Most importantly the painter kept the ground moist enough, since the entire building had practically been freshly constructed, so all plaster layers were taking a longer time to dry. Namely, the old masters were well aware of the fact that the ground that contains a good amount of lime, whose part in relation to the fill increases with each layer nearer the surface, enables a slower process of evaporation and constant elimination of calcium hydroxide to the surface. If drying of the final plaster layer (intonaco) occurs too quickly, it prevents calcium carbonate formation and hence the binding of pigments into a hard crystalline² structure, therefore making the top layer surface with applied pigments less resistant to outside conditions. Since restoration procedures, which would cause a layer of calcium carbonate to form on the restored surfaces, a substance that is the most permanent binder of pigments together with a lime ground, are often not feasible due to various reasons, restorers and mostly scientists concern themselves with investigating the most permanent and most compatible binder that in the long-term produces least changes in its structure and does not function as a foreign body on the surface of the wall and ceiling painting, which in time, and according to its optic and material properties, begins to flake from its

¹ HUDOKLIN 1955, p. 5.

² The term crystalline is explained among others also by Križnar: "I.../crystalline crust is therefore a crystallised calcium carbonate/...!": KRIŽNAR 2006, p. 30.



Figure 1: Testing binders in practice – lime whitewash on a cardboard support (also figure 3 and 4).



Figure 2: Detail of the lime whitewash with red preparatory drawing on the nave vault painting of the cathedral.

surroundings. Very promising in recent years has proven the method of inserting very tiny scattered particles of calcium hydroxide (slaked lime) inside the actual plaster, where it consolidates and regenerates the weakened binder.

With greater damage, where the colour layer has fallen off together with the lower plaster layer or layers, the fresco technique can be used in the reconstruction of the wall and ceiling painting, although not exactly the same conditions are available to us now as enjoyed by Quaglio, whose skilled mason trained precisely for this purpose prepared a piece of new plaster for him every day as they went along, and where a good amount of moisture was welcome. The mason and painter did not have to pay particular attention to damaging their existing work with falling plaster, spills on the surfaces or running paint, since as a rule, which is still valid today, work was always begun at the top of the wall or arch and proceeded downwards. In repairing wall and ceiling paintings, however, an excess of moisture can often cause more damage than not. Nevertheless, before an application of fresh plaster to replace the one fallen off, the ground must be well prepared with adequate moisture, since the surroundings of the damaged part normally act as a potent blotter which soak up the water in the new plaster, and such plaster cannot carbonise well enough, remaining crumbly and brittle. Reconstructing the paint layer using several coats and integrating colour hues with neighbouring surfaces demands for an experienced restorer-retoucher, who must be able to anticipate the ways in which the colour hues will change. As is well known from practice and theory, wet pigments need to be applied quickly as absorbency changes with the formation of the calcium carbonate crust, and the surface can no longer be painted uniformly. In the restoration process to restore missing parts of the plaster and colour layers using the proper fresco technique, smaller and shallower surfaces of the new lime plaster quickly lose moisture amid a larger mass, therefore they call for even faster work than the production of a totally new fresco surface. Such work should therefore be entrusted only to those who are at every



Figure 3: Experimentation with colours using various percentages of added binder.

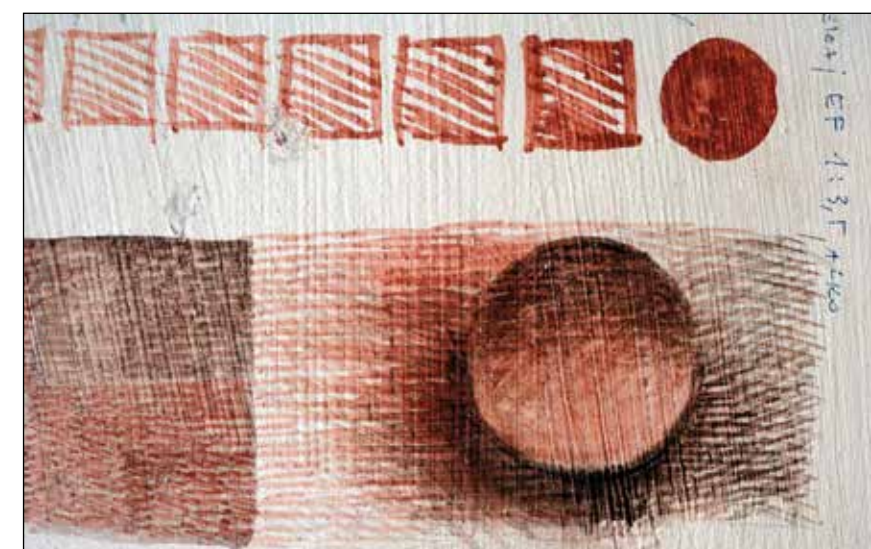


Figure 4: Modelling with lines and trying out a multi-layered application of colour.



Figure 5: Preparing pots of pigments and binders in the form of tablets, which need to be diluted with water.

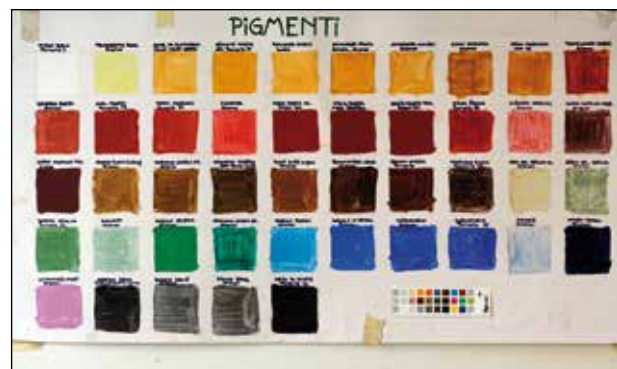


Figure 6: Trying out various pigments and binders (Tylose MH 300).



Figure 7: The only larger reconstruction of the nave vault painting – the head of the personified virtue at the crossing of quadrants G, H and 8, 9 before, during and after retouching.

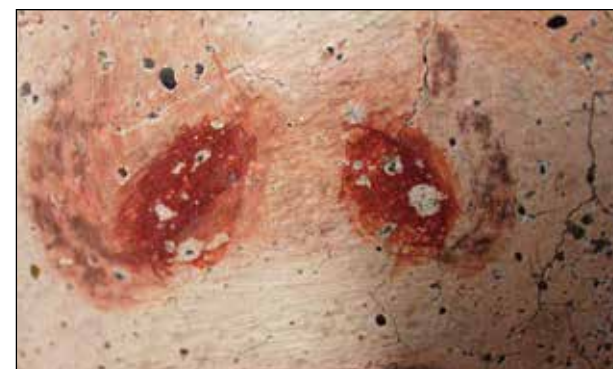


Figure 8: Two frequently occurring types of damage on the painted surface of the vault: the flaking of tiny particles of the top layer of whitewash together with the colour layer, and the darkening of the red pigment (vermillion).

moment aware of the processes that are underhand in the plaster layers and when work needs to be finished. Due to the incredibly quick loss of moisture, carbonisation in these new surfaces occurs very quickly, resulting in a very thin and brittle layer of calcium carbonate that only very gently binds the pigments to the ground.

In the case of the tiny areas of damage, which were most abundant on the surface of Quaglio's wall and ceiling paintings on the vault of the Cathedral of St Nicholas (figure 8),³ the retouch technique with its formation of calcium carbonate as a binder and meticulous filling of tiny damage would prove a senseless task, which would, besides thousands of white patches across the whole of the surface, probably also cause a delay in the project and produce unreliable retouch results. Following an extremely arduous and extensive, yet very successful removal of impurities, overpaints and consolidation of colour layers by means of ammonium carbonate coatings across the entire painted vault,⁴ all colour and tonal relations were after many years restored to their original values. However, the unfortunate side of thorough cleaning is the uncovering of all big and small changes on the surface, which had occurred over the centuries and had become visible on the depicted surfaces. Numerous cracks and colour layers that had peeled off or had changed to dust were hidden under quite a thick layer of soot and other impurities that could not be cleaned more frequently given their location, high up under the vault. The junctions on the edges of the giornate became more apparent after cleaning, since these areas were usually retouched more often, or were corrected by the artist in the secco technique due to uneven drying of the connecting surfaces, which caused poor carbonisation and flaking of the colour layer in this area.

In the selection of binder for retouching Quaglio's depicted vault, the choice rested between ammonium ca-



Figure 9: Retouching the angel's head in quadrant F8.

seinate, in practice mostly used by Italian restorers, Primal AC33, which is popularly used in the restoration profession in Slovenia and around the world, and so-called watercolours, which are most often referred to in professional literature and restoration reports and for which it is not known precisely which binder they contain given the fact that each manufacturer makes the constituents of their paints a trade secret. Since no risk could be taken in such an important project as the restoration of Quaglio's wall and ceiling paintings with binders that had not really been tested up till that point (ammonium caseinate), due to the experience of the yellowing of caseinate binders, and the need to also pay attention to the reversibility factor, the method of artificial ageing was chosen, where by means of a simulated ten-year ageing process using intense lighting, temperature and moisture, it was found which binder produced most suitable results.

From an exhausting investigation on the effects of artificial ageing on a group of binders⁵ that are more commonly used in the restoration practice of wall paintings, in which samples were exposed to alternating cycles of temperature fluctuations, relative humidity and UV-radiation, it was apparent that these strains had least effect on the binder Tylose MH 300. The latter was therefore selected as the chosen binder for retouching Quaglio's wall and ceiling paintings. Despite the technically less cumbersome work in covering darker parts with lighter tones and the easier task of adding

³ The authors of the photographs are Valentin Benedik and Rado Zoubek, ZVKDS Restoration Centre.

⁴ Cf. papers on the procedures and results of cleaning by restorers: Marta Bensa, *Report on the initial cleaning and consolidation procedures* and Giovanna Nevyjel, and Claudia Ragazzoni, *Final report on the cleaning*.

⁵ For determining the binder to be used in retouching see paper by Polonca Ropret, *Investigations of colour layers*.



Figure 10: Retouching the antique bust – quadrant P25.

several coats using the binders Primal AC33 and ammonium caseinate, we persisted, due to better technical properties and greater reversibility, in using a 0.75- to 1.5- percent solution of Tylose MH 300 in water to the project's completion. Even though Italian colleague restorers, who collaborated on the cleaning of the wall and ceiling paintings, reported on the positive experiences of using ammonium caseinate in practice, the use of which is also mentioned in didactic restoration literature,⁶ this binder was not selected due to our longstanding experience in using casein in the production of backing for detached frescoes. Surfaces treated with lime-casein backing do tend to yellow with the years. Only in certain filled cracks and the reconstruction

of the hand in the area above the organ, where we left the preserved later plaster (applied during restoration work after the 1895 earthquake), was a 3- to 5- percent solution of Primal AC33 in water used, due to difficulties with coverage. Restorers needed approximately three times as long when working with the Tylose binder as opposed to working with the Primal or caseinate, mainly due to the aforementioned difficulties with permanent water solubility and dissolution of the colour layers underneath. Also, in the largest reconstructed area of the wall and ceiling paintings in fields H8 and H9, most of the reconstruction was performed using a cellulose binder, only some darker parts were additionally treated with the Primal AC33 binder.

⁶ GASPAROLI 1999, p. 189.



Figure 11: Retouching a detail in the area of quadrant N17.

For retouching the wall and ceiling paintings we used a binder, which had up till that point not been used for wall paintings in Slovenia. Our decision is backed up by a thoroughly conducted investigation carried out in a laboratory, where it was found that our chosen binder possesses stable properties, but can also be removed. With implemented thermal insulation on the attic side of the vault, the temperature fluctuations that were present before should cease, so all changes on the painted surface which were being produced as a result should also be greatly reduced. That is of course presuming that no unmonitored and unnoticed leakage of meteoric waters through the roofing occurs.

The conservation-restoration project and Quaglio's painting process

Rado Zoubek



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KEY WORDS:

wall paintings, buon fresco, painting onto lime whitewash, giornata, trullisatio, arriccio, intonaco

ABSTRACT

Numerous experts from the restoration, science and art historical field were involved for several years (2002–2006) in the project of renovating the wall and ceiling paintings of Giulio Quaglio on the vault of Ljubljana Cathedral. The work of restorers took place on a special platform, anchored into the walls of the nave under the vault, onto which a fixed scaffold with a moveable scaffold was arranged. After completing investigations and documenting the state of all painted surfaces on the vault and the western wall of the nave, filling in numerous smaller and larger cracks, mechanical and chemical removal of all impurities and overpaints, the whole of the surface of the wall and ceiling paintings was adapted to the original tonal and colour values of Quaglio's palette by means of retouching and reconstruction. By repairing the damage that had occurred during the anchoring of the platform and renovation of all decorative surfaces downwards to the cornice, all renovation work was complete in September 2006. During the project the method of cleaning wall paintings using ammonium carbonate coatings was used more extensively for the first time in Slovenia. By erecting a suitable platform, restoration work could be viewed by numerous visitors and experts from various fields.

INTRODUCTION

The conservation-restoration project on the mural paintings by Giulio Quaglio on the nave vault and the western wall of the Cathedral of St Nicholas in Ljubljana, under the guidance of the IPCHS Restoration Centre, took place between 2002 and 2006.

The material for the presentation of the renovations spanning several years published in this book was chosen from more extensive documentation, the largest part of which was accumulated in documenting the restorers on the scaffold, and naturally supplemented with investigations, opinions, research reports and results by all those that took part in the project. Some one thousand photographs taken, numerous videotapes, reports by writers of various expertises, meetings, committees; presentations of how work was proceeding, press conferences, filming for various cultural programmes, everyday work of the large team of restorers, as well as many other events made up all that took place on the restorers' platform and in its vicinity throughout the four years. In presenting the project, events are not presented absolutely chronologically, even though individual areas of renovation work follow one another in a logical sequence. Video documentation, which was shot during work, was presented to the general public by means of various media, whereas visitors to the cathedral were able to view a video presentation (kiosk) in all the stages of the project during work. Renovation work was actually hidden from visitors' eyes behind the platform, which had been erected for that purpose at a height of thirteen metres. This presentation primarily focuses on the pictorial material since the text was produced in studying and arranging the several thousand shots taken during actual restoration work.

CONSTRUCTION OF THE CHURCH BUILDING – THE VAULT

Before we begin describing and listing the tasks that brought us to the onset of the renovations of the painted vault and western wall of the nave of the Cathedral of St Nicholas, we should first create an approximate picture of the building's origins. As can be discerned from accurate sources,¹ the church of today is located in the spot where an older building used to stand, which no longer suited the needs of its times, both in terms of space and aesthetics. Selecting almost the same spot obviously depended on the limited space between the Ljubljanica river and the castle hill, however, the foundations of the old church were probably sturdy enough as support to the new walls. It is interesting to note from the

¹ DOLNIČAR 2003.

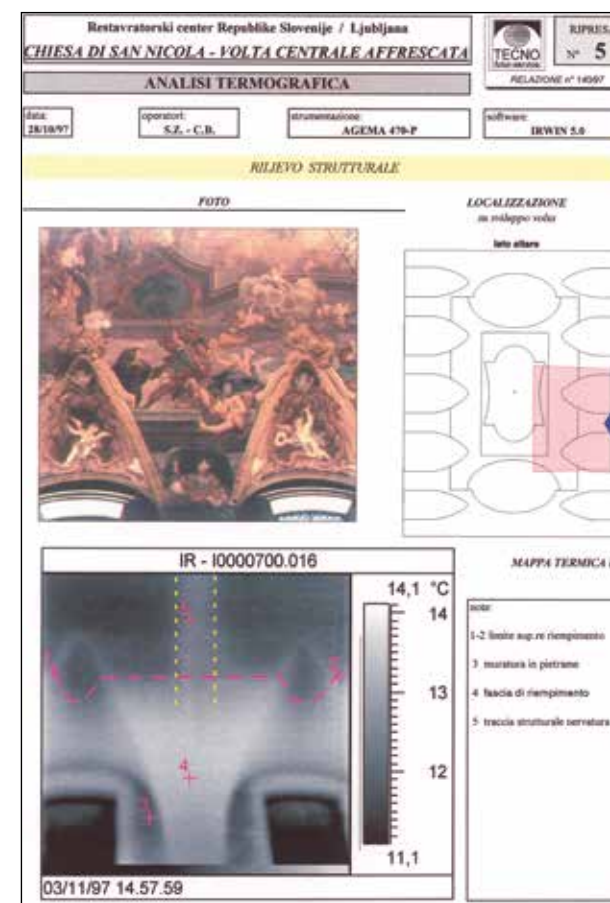


Figure 1: The image of the thermographic investigations (SER.CO.TEC. 2006) shows a trace of the reinforcing arched support going upwards across the middle (yellow lines), and the height and progression of the horizontal abutment in the attic (red lines).

A simplified construction of the main nave (without roofing). The illustration shows the system of construction of the vault of the Cathedral of St Nicholas in Ljubljana.

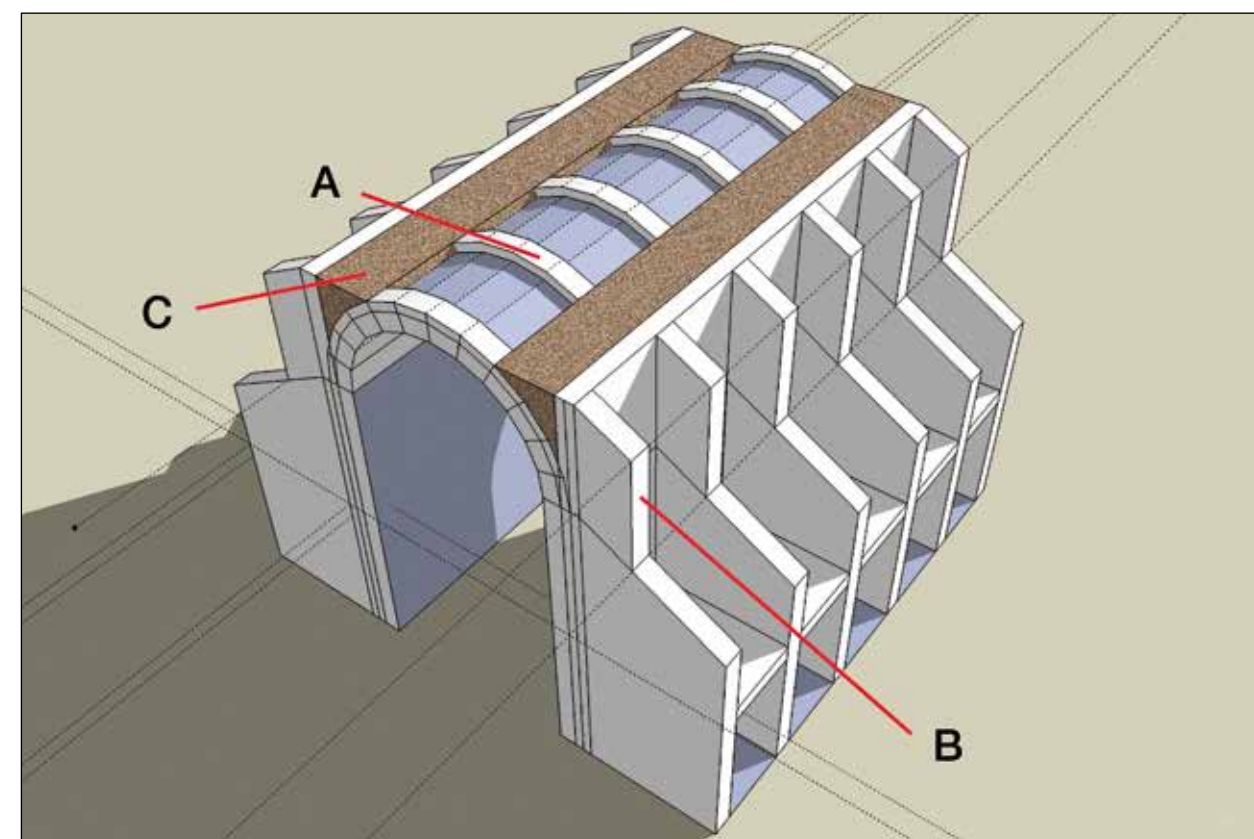
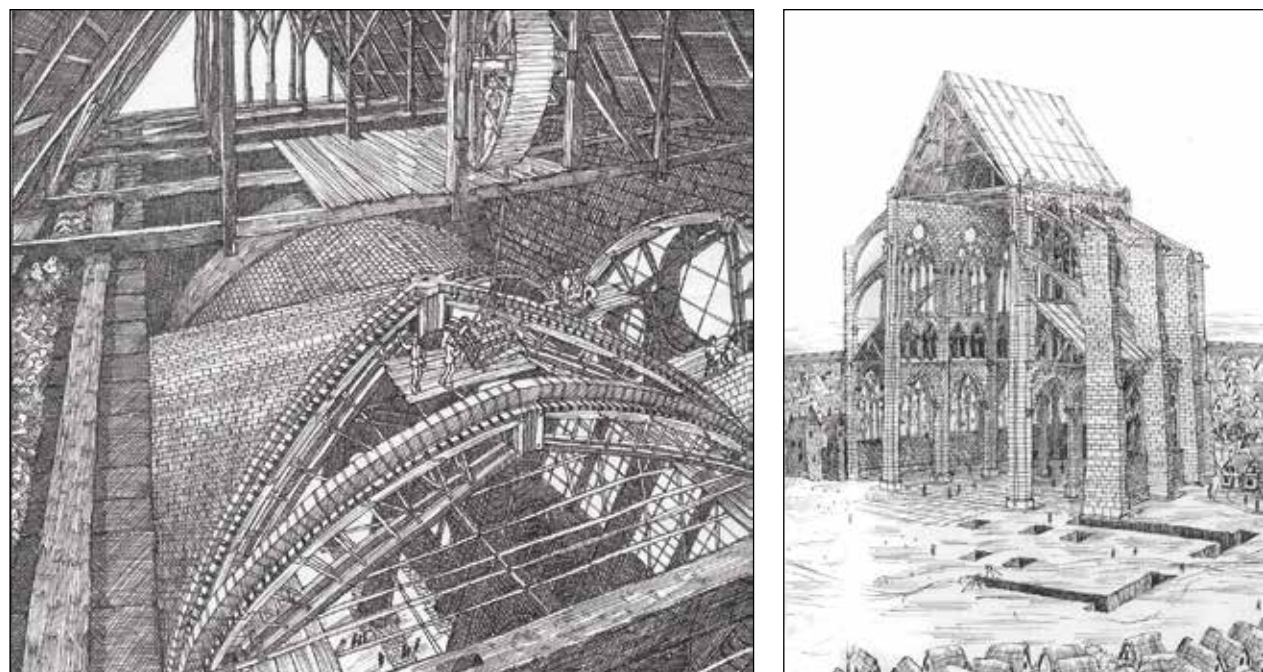


Figure 2: By constructing the walls of the main nave, side chapels, tribunes and their vaulting simultaneously, sufficient support was ensured for the construction of the barrel vault. Besides the side chapels and tribunes, the splaying out of the vault is reduced also by the system of supporting cornices, onto which the vault's reinforcing arched supports lean. The abutment (brown) in the triangle between the walls of the nave and above the springing with its weight additionally steadies the splaying out of the vault. A: Reinforcing arched support of the vault B: Supporting cornice C: Abutment



Figures 3 and 4: In both drawings the draftsman has tried to clearly present the method of construction and aids which were once used in construction. It is clear from both that by setting up the roofing first, a safe and primarily supervised construction of the more demanding parts of the construction was assured, and vaults can most certainly be classed as such. Figure 3 shows the details during construction, which was, in comparison to contemporary building, anything but easy and safe.

chronicles of the newly emerging cathedral that the church was demolished gradually, in parts.² Initially the east part was pulled down and construction of today's presbytery with side spaces and transept was begun, meanwhile the nave and bell tower of the old church remained where they were, probably serving as a storage area and shelter for the construction workers. Since it was no simple task in those times to produce large, water-resistant covering surfaces, each step in the construction had to be carefully planned. Burnt lime, which was according to sources brought in for construction in large quantities, needed to be stored in a dry place before being slaked, requiring a good amount of space. Bricks or wood could also not be left in rain or frost, since this would cause damage to the materials. A large storage area was required for all this.

After building over the foundations, the walls of all the spaces were built upwards simultaneously. In such a way the walls of the side spaces were made to serve as supports to the higher interior walls, enabling carpenters to safely install the roofing without fear of collapse, which covered up the whole space and enabled masons to continue with work. A secure, impermeable roof was vital in order for the carpenters to prepare the cladding for the vault and for the masons to perform their demanding work successfully. Let us imagine what would happen if they began vaulting without a roof; even a minor summer storm would wet the wooden cladding and sweep away the fine, loose mortar between the laid brickwork. Therefore an important rule was set out in the school books of the construction profession already in the 20th century:³ first a quality roof, then the vaulting. A special, sturdy construction was built for panelling the vault, with wedges on the underside. Due to the incredible vertical pressure of the constructed vault, stripping invariably presents a demanding and dangerous task since any strong knocks to the supporting beams could represent the danger of

causing damage or even collapse of the vault. Therefore the wedges were removed very carefully, without hard or rough blows. The amount of time taken from the completed vaulting to stripping is not precisely documented, most frequently several weeks are mentioned. In the clear drawings from the book by David Macaulay⁴ the system of vault construction can only be seen clearly after the roofing has been put in place. In the case of the Church of St Nicholas a fairly precise reconstruction of the construction of the walls, vaults and roofing can be compiled through careful study of material (Cf. DOLNIČAR 2003). Since we are mostly concerned with the construction of the vault as the support to Quaglio's paintings, let us only mention that the construction of the main nave used the already constructed presbytery with transept as a support on the eastern side, and the not yet demolished bell tower of the old church on the western side.

As we know Quaglio first arrived in Ljubljana on the last day of April 1703 and already finished the fresco on the vault of the presbytery in May. Evidently he soon found his feet in his new environment, probably aided by the Italian craftsmen residing in Ljubljana, who had been actively involved in construction work on the church. They could certainly offer him advice on the choice of locally tested materials, particularly the selection of quality aged slaked lime. In that year he painted the illusionistic dome at the crossing of the naves (September 1703), as well as the exterior of the church. On his arrival to Ljubljana at the beginning of 1704, he continued work in the presbytery.

On 13 July 1704 they began covering the roof of the new nave and completed work in six weeks on 23 August. In the meantime Quaglio painted in the transept, completing the Chapel of St Dismas, whilst probably keeping a vigilant eye on construction work in the main nave. On 25 September, when he was departing from Ljubljana with a signed contract for painting the nave and western wall, he was not yet able to precisely measure up and

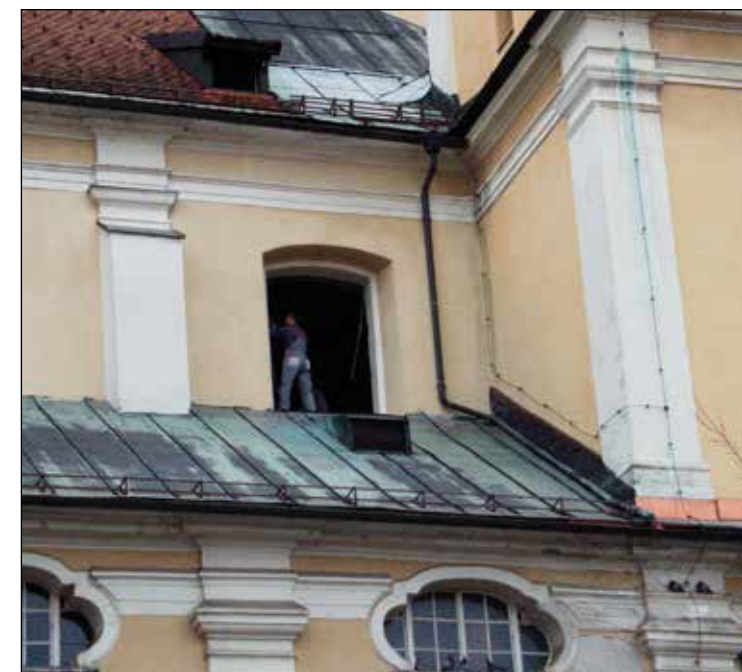


Figure 5: Supporting cornice between two windows – right northern bell tower.



Figure 6: A part of Quaglio's wall painting underneath the whitewashes on the triumphal arch wall.

draft out the nave with window openings and lunettes, since it did not yet exist at that time and the nave was only covered by a roof. He probably took exact plans and sketches with him to Italy, which he used to produce his own studies back home. On 15 November masons completed the vaulting of 16 vaults (probably in the eight chapels and the eight tribunes above them). By means of vaulting, they procured all the necessary sturdy side support for the anticipated outward pressure of the vault.

The walls had consolidated enough by the following year and on 15 March 1705 carpenters began producing a supporting scaffold for the construction of the vault. In a fortnight, on 2 April, they began vaulting, which lasted until 30 April.⁵

When the supported vault was stripped is not known. Probably in a week, or two, certainly such a significant event should be recorded in the chronicles, given that this is the most significant moment in the construction of a vault. Soon thereafter, on 10 May, Quaglio arrived in Ljubljana – he may have even attended the removal of the vault cladding.

After the cladding was removed from the vault, the lower scaffold, which was used to hold up the beams as a vault support, probably remained at the same height, which would have been somewhere near the cornice, or just above, at a very similar height as the platform was set up during restoration treatment. This scaffolding construction was required for the set up of an additional scaffold used for plastering the inside surface of the vault, lunette and surface around the window openings, the surface of the western wall and form the profiles of the triumphal arch and the western wall. With the application of plaster from underneath, a ground was prepared for Quaglio's planned wall and ceiling paintings. The painter probably experienced no difficulties with the masons during the preparation of the levelling plasters and the later colour plasters, given that they had worked together during the previous two years preparing numerous grounds for exteriors as well as interiors. Before Quaglio could begin painting in this

part of the church, first the masons, and then the stucco workers, had to shape the profiles on the western and eastern triumphal arch wall of the nave. We would be hard pressed to imagine that the stucco workers would be so careful in their application of plaster onto the profiles so as not to soil or cover the already painted frescos. Evidence that clearly confirms the fact (figure 6) that all masonry work was completed before painting is Quaglio's depiction on the vault, which spreads across the profiles of the triumphal arch. However, the possibility that the painter and workers worked side by side in the initial weeks or a month or so cannot be excluded, since Quaglio had quite some work with his preparations at the onset.

If the vaulting was completed by 30 April 1705,⁶ then the lime mortar had to be left to harden for at least two or three weeks in order for the supporting cladding underneath the vault to be removed safely. Here the wooden wedges should again be mentioned, but this time those that are inserted, or better said nailed, into the brickwork area of the upper part of the vault, and which, according to the words of experts,⁷ took on the load that was released by stripping. At that time the whole vault subsided somewhat, causing pressure to the upper parts of the neighbouring bricks and mortar in-between, which had not dried enough in such a short time to resist the immense pressure. These wedges therefore functioned like a kind of buffer of forces during stripping. We can only guess at whether they also served the same purpose later and responded with their flexibility to the changes in humidity and temperature in the atmosphere. In quarries, cracks used to be widened by nailing wooden wedges in and then pouring water over them. Wood soaked in such a way expanded in volume and the immense pressure was able to blow up large pieces of stone. The situation is not as serious in the attic of Ljubljana Cathedral of course, since the vault has been thoroughly cleaned and covered with thermal insulation. The wetting of the existing wedges in the vault would probably cause new cracks. We

² LAVRIČ 2007, p. 11.

³ *Gradbeni elementi 5, Ometi in napuščji. Masivni podi. Izolacije: skripta za visoke in nizke gradnje*, Ljubljana 1950.

⁴ David Macaulay, *Cathedral: The Story of its Construction*, Boston 1973, pp. 46–47 and p. 56.

⁵ All details are summarized according to: DOLNIČAR 2003.

⁶ DOLNIČAR 2003, p. 306.

⁷ KOS 2004.



Figure 7: View of the western wall – January 2003. Despite strong daylight, the western wall is in half darkness because of the scaffold without artificial light.

attempted to pull out a wedge, however, we were unsuccessful even when using tools. It would be interesting to conduct an analysis on the samples of these wedges, since it is possible that they have expanded and contracted

so many times during the last 300 years that today's expansions caused by wetting are minimal.

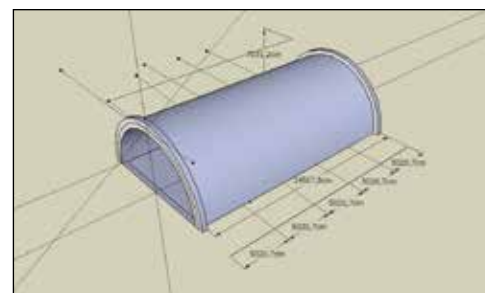


Figure 8: The semi circular barrel vault of the nave.

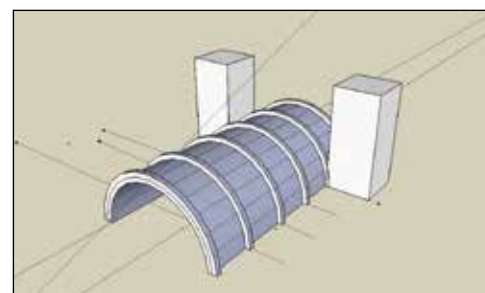


Figure 9: The vault is reinforced with arched supports and fixed between the bell towers.

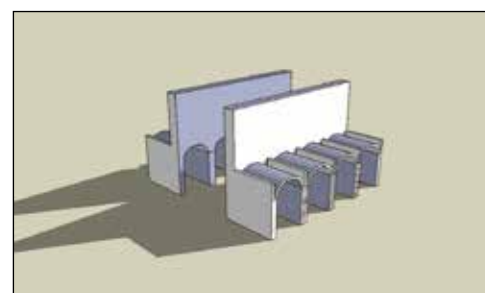


Figure 10: During construction, the walls of the nave were supported by the side chapels.

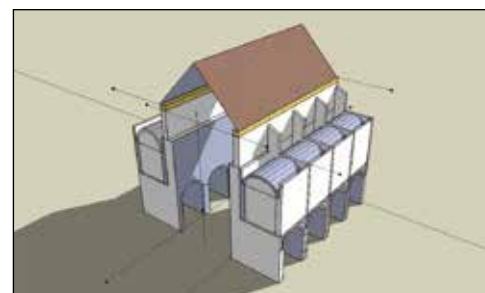


Figure 11: The roofing was placed onto the supported walls.

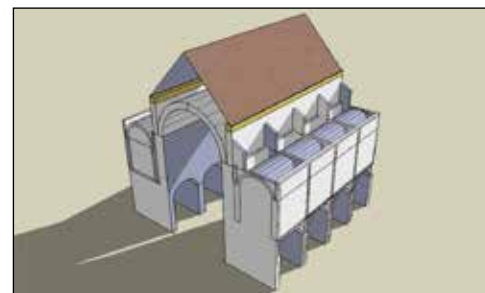


Figure 12: The nave ceiling was vaulted under the protection of the roofing.

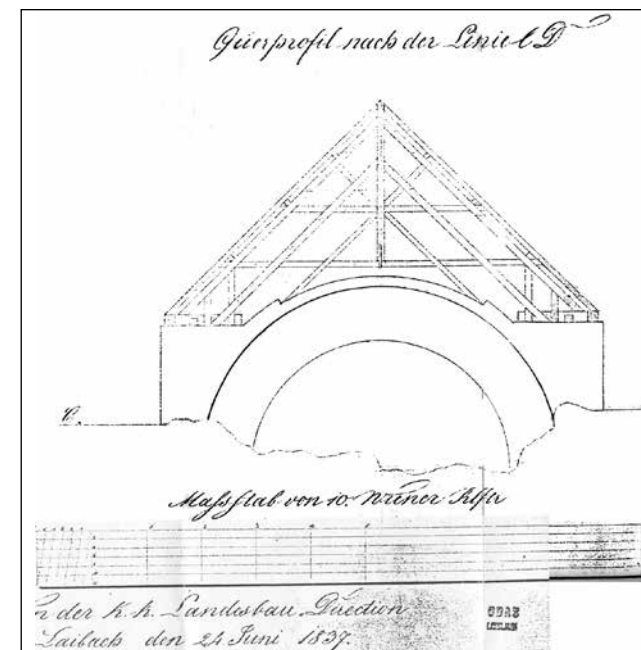


Figure 13: A drawing of the roofing from 1837 (Archives of the Republic of Slovenia).

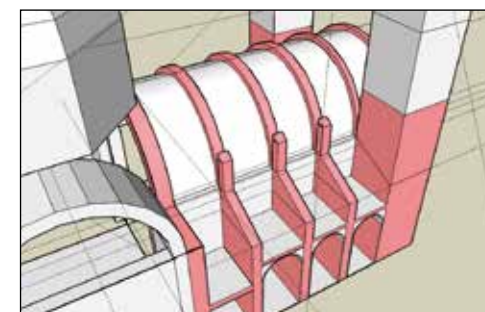


Figure 14: The system of supports to the vault (coloured red).

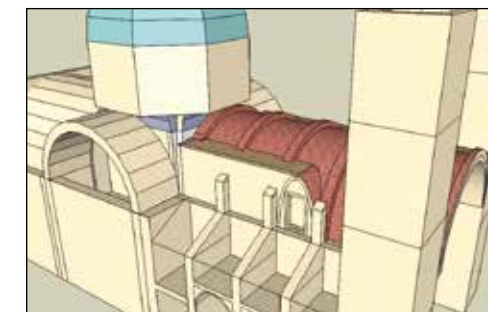


Figure 15: The abutment between the wall of the nave and vault (coloured brown).

A SIMPLIFIED ACCOUNT OF THE CONSTRUCTION OF THE NAIVE VAULT

The nave ceiling is a classic barrel vault with a semi-circular intersection and a radius of 6.5 m and length of 25 m (figure 8). To provide more stability to the vault, it has been reinforced further on the top side by arched brick supports, spaced at a distance of 5.5 m from each other. The additional stability of the vault in the western part was provided by both bell towers (figure 9). Before construction work on the vault began, sturdy loadbearing walls were erected, supported on the side by the walls and vaults of the side chapels, tribunes and supporting cornices (figure 10). The wooden roofing with roof cover was placed onto this fairly sturdy construction (August 1704; figure 11). The cladding and construction of the nave vault was continued in April of the following year (2 April), since all the walls and side vaults had to consolidate enough in order to take on the anticipated vertical and horizontal load (figure 12).

The red coloured elements in figure 14 are those that make sure that the movements (splaying out) of the vault in a vertical and horizontal direction reach minimal proportions. In order to weigh down the springing of the vault, an abutment was added, which lessens the horizontal splaying out of the vault somewhat (figure 15).

On the drawing from 1837 (figure 13) we can see that the weight of the construction of the roofing bore no direct pressure onto the vault, but was directed towards the springing of the vault by means of the arched supports and abutment, thus reducing any splaying out.



Figure 16: A detail from a probe of the vault, located within quadrant H19

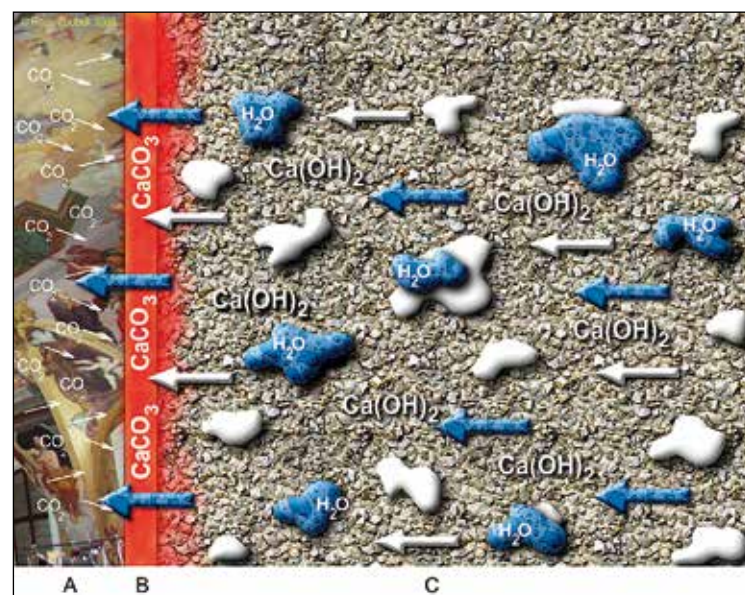


Figure 17: The development of calcium carbonate (CaCO_3) on the surface of the fresco: A – carbon dioxide in the atmosphere, B – colour layer, C – intonaco (skim coat). During the drying process of intonaco, slaked lime ($\text{Ca}(\text{OH})_2$) is pushed through the capillaries towards the surface together with the water, where the applied pigments moistened with water are located. When the carbon dioxide (CO_2) from the air and the slaked lime come into contact, a crust of the invisible calcium carbonate (CaCO_3) begins to form, which binds the pigments with the intonaco). The longer the duration that the calcium hydroxide and water need to be transported to the surface, the thicker the crust of calcium carbonate. It gains thickness from the surface into the depth of the intonaco. The process is complete with the drying of the plaster.

PREPARATION OF THE SUPPORT FOR QUAGLIO'S PAINTING

Quaglio actually had the whole of the church building as his painterly support, of course not literally, but in terms of the connecting and neighbouring walls that retained moisture with their thickness, and in the initial months prevented the plaster from drying out too quickly. We should not forget that the masons, just before his arrival in Ljubljana in 1705, vaulted the nave area, and then soon, right after stripping, they plastered the vault on its underside using binding-levelling plaster, therefore the whole vault, as well as other parts of the building, must have still been fairly moist. The plasterwork was done using short, hard strokes, so that the space between the brickwork was closed up from the underside, also reducing the force of gravity with a horizontal grasp.

As already mentioned, the masons applied to, or better plastered, the brick wall with the first and most important layer, also called the trullisatio. This is the layer of plaster onto which all later applied plaster layers and whitewashes bind to.⁸ An important fact is that it had to dry slowly, requiring at least 8-10 days, and had to remain coarse, unsmooth in order to provide better attachment for subsequent layers. As can be seen in figure 16, the masons closed up the space between the brickwork with a very heavy mortar. We can also note that they combined the layers of the trullisatio, arriccio and intonaco into one. Onto this surface, they then applied a layer of smooth plaster, the skim coat or intonaco.

We should not overlook a very important fact that each part of plaster applied to the interior walls and vaults played a dual role; on the one hand it was the last layer of the interior wall, and on the other, the ground or support for a quality wall painting to be executed onto the fresh plasterwork.

The masons had to prepare this first layer to a high standard, regardless of whether the vault would be painted or not. Weakly adhering and too thickly applied plaster would very soon begin to display signs of bad execution by cracking as well as flaking off.

In the application of plaster and painting to the curved part of the vault, Quaglio and the masons did not need to worry about material falling downwards, as is the case for instance in plastering vertical walls, therefore in this case work could also proceed in the opposite direction – also from the lower areas towards the top of the vault. A rule prevails in buon fresco painting that the part of the plaster that has not been painted during the time the plaster is still wet is cut at a blunt angle on the following day (or the very same day if work continues), and a fresh layer of plaster is prepared next to it in order to continue painting. Later, only those parts of the plasterwork are removed to which paint has not adhered well, and blank areas are filled in with fresh plaster, with the unsuccessful part being repainted. Such a work process naturally encroaches on the creative process of the painter who is already confined to the surface to be covered by a given giornata in advance.

Quaglio can already be listed among those masters that liberated themselves from the limitations of consistently abiding by the classical technology of the fresco, enhancing it by stretching the time of execution by applying a thick lime whitewash onto the still wet plasterwork. By adding lime and moisture onto the intonaco he extended the duration of painting, while at the same time forming a thicker crust of calcium carbonate, which combined with the intonaco, precisely due to the abundance of lime mixed with the carbon dioxide from the air.

The onset of using lime as a pigment binder in the form of already prepared, variously coloured lime whitewashes enabled overlapping painting and allowed for later corrections to be performed using inpainting with the same lime binder.

A section through the brick vault clearly illustrates the construction of the vault with arched supports upon whose sides the roofing con-

⁸ HUDOKLIN 1955, p. 28.



Figure 18: A cross-section of the vault's brick construction.

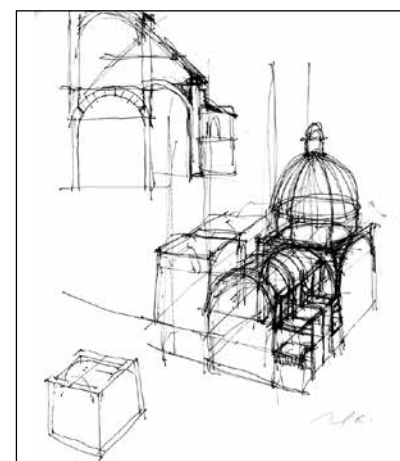


Figure 19: Sketching out the relations.



Figure 20: The arch of a lunette.



Figure 21: The anchoring system of the roofing proceeds tangentially towards the springing of the vault.

struction rests. A series of wedges has been inserted lengthwise into the brickwork every few rows (figure 18, detail top left). In figure 20, the top of the lunette can be seen well, where the bricks have been laid at a right angle in the direction of the brickwork of the large vault. The abutment reaches almost to the top of the structure of the lunette. In figure 21, the anchoring of the roofing construction can be seen well, directed towards the springing of the vault.

The vault was thoroughly cleaned during conservation-restoration treatment. The damage to the roof cover, due to meteoric water running along the wooden roofing construction, reached also places that were not just below the damaged area.

In order to better understand the system of construction, size of individual spaces and their interconnectedness, spatial sketches were created as aids (figure 19).



Figure 22: Hand-made brick.



Figure 26: In the area of the lower plaster, a small cross made in charcoal.



Figure 23: Damaged surface of the vault painting (location H19).

The vault is made from bricks, apart from the bottom starting point (the springing of the vault), where stone slabs were used due to greater anticipated pressure (figure 41). In the attic, hand-made bricks were found in the abutment, which measured approximately 19 cm in width, 24 cm in length and 4.5 cm in height (figure 22). The same bricks were used in the construction of reinforcing arched brick supports. The plaster on the damaged surface of the painted vault (location H19 – figure 23) was removed in the form of a square probe up to the brick construction. The lime plaster in the thickness of 1.5 cm is composed of two layers (figures 24, 25), which are the top layer of the 3 to 5 mm thick intonaco (skim coat), and the 10 to 12 mm thick arriccio (brown coat). In the area of the lower plaster inside the probe, a mark was discovered (a small cross made in charcoal – figure 26), which was used to mark one of the points in the junction of the surface before the intonaco was laid down. Bricks were also used as the main construction material in forming profiles, cornices and pilasters (figure 27). Besides conservation-restoration work on the painted surfaces, also all crumbled off, cracked and otherwise damaged areas on the profiles, cornices and other ornamental elements had to be renovated (figures 29, 33). In preparing the bearings for anchoring the supports of the restoration



Figures 24, 25: The lime plaster is composed of two layers.



Figure 27: The window sill beneath the vault window where the brick construction of the profiles is visible.



Figure 28: Damage occurred with the anchoring of the restoration platform.



Figure 30: Limit between upper and lower plaster – sample: SNL 228; conditions: transmission light, crossed polars.

platform, certain damage occurred to the walls (figure 28) and profiles of the painted medallions. Inside these niches, which could also have been probes, we had the opportunity to observe what kind of material was used in the construction of the more than one-meter thick walls. As can be seen from the shot, the material is composed of stone and probably constructed using quicklime, finally slaked on the wall itself. An exhaustive report was produced about the composition of the collected sample (SNL 228, figures 30, 31) of plasterwork from the square probe from location H19 and collected samples of the profile ornamentation on the cornices.⁹

The field between the main cornice and the cornice below the windows of the nave, decorated with marbles fields and gilded frames was, due to the location of the anchor points of the work platform, prepared for the final presentation by the IPCHS RC restoration team only in its top quarter. The remaining surfaces were renovated during the final stages of work after removal of the restoration platform in August 2006. Although perhaps in the shadow of the renovated wall and ceiling paintings of the vault and western wall, the refurbishment of these blank spaces downwards towards the cornice, including the removal of all heavily darkened whitewashes, modelling in of architectural parts, retouches, reconstruction and gilding

⁹ KRAMAR 2007. Photographs 30 and 31 are from the mentioned report (5 and 6).



Figure 29: The application of a new binding mortar at the beginning of the reconstruction of the cornice.

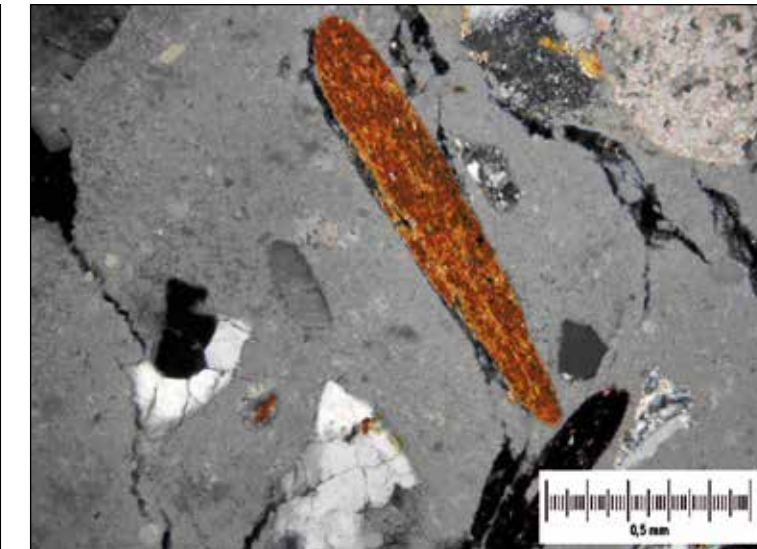


Figure 31: Aggregate in upper plaster – sample: SNL 228; conditions: transmission light, crossed polars.

of decorative fields, made an essential impact on the quality of the surroundings of the wall and ceiling paintings themselves, greatly enhancing the level of lighting of the whole of the nave with its light surfaces.

CONSTRUCTION AND STRUCTURAL ANALYSIS OF THE VAULT

As part of the investigations on the supporting structure of the main nave, a report¹⁰ was produced in June 2004 with suggestions for the most urgent restoration-consolidation treatment, which was condensed into four points.

1. Injecting of construction cracks

Injecting of all cracks was recommended, particularly longitudinal ones, spaced 20 to 30 cm apart. ZRMK experts assessed the toughness of the lime binding to be between 1.5 and 2 MPa, with the toughness of the injecting material needing to reach at least 5 MPa. A suitable insertion of the injecting material was also suggested by the experts, which was from the underside of the vault. Before making their own samples, the properties of three injecting materials, or materials intended to be used in the restoration of the painted vault, were analysed by ZRMK. All the listed materials were especially developed for use on the restoration of cracks and missing parts of plaster:

PLM – I (CTS – Italy, import agent SAMSON KAMNIK, d. o. o.),

PLM – A (CTS, import agent SAMSON KAMNIK, d. o. o.),

PLM – AL (CTS, import agent SAMSON KAMNIK, d. o. o.).

The technical specifications list the following discrepancies in strength:

PLM – I = 2.6 MPa,

PLM – A = 1.7 MPa,

PLM – AL = 0.9 MPa.

After testing, it was found that the mentioned materials dried insufficiently in the metal testing moulds and had not hardened after three days. Sample PLM-I did not harden after seven days, whereas the other two did not exceed the value of 0.5 MPa despite becoming dry. Since it was calculated that these materials would not attain satisfactory dryness even during a longer period of time, the experts at ZRMK prepared their own samples of injecting materials with the following properties:

Table no. 2 shows results of flexural and compressive strength after 21 days in air.

INJECTING MATERIAL	2	3	4	5	6	7
Flexural strength	1.6 MPa	0.4 MPa	0.7 MPa	0.6 MPa	0.5 MPa	0.6 MPa
Compressive strength	19.6 MPa	2.3 MPa	3.4 MPa	1.3 MPa	1.1 MPa	0.9 MPa
Volume mass	1633 kg/m ³	1211 kg/m ³	1246 kg/m ³	1246 kg/m ³	1101 kg/m ³	836 kg/m ³
Content of cement in the material	33.2 %	10 %	9.6 %	5 %	1.6 %	–
Content of mixed water	40 %	60 %	55 %	62 %	65 %	105 %

The report specifies the properties of a good quality injecting material: “The injecting material needs to be formulated into a composition that can trickle into the cracks and penetrate into the pores and intergranular spaces of the wall conglomerate. The hardened injecting material should ensure quality adhesion of grains in the conglomerate. According to investigations spanning over several years at ZRMK, its compressive strength in the case of structural repairs should measure at least 5-8 MPa. Given the fact that the injecting material cannot attain the defined solidity with use of non-cement mineral hydraulic binders, the material needs to contain a certain amount of cement.



Figure 32: Condition before treatment – a new crack, next to another, once already filled crack, runs along one side and then the other.

This at the same time enables a reduced content of mix (and transporting water), or a lower water-binder ratio at the same consistency.”

It was estimated that a suitable compressive strength of approximately 5 MPa would be attained after 90 days only by using an injecting material labelled 3 or 4. Other materials were not suitable due to the high content of cement, or insufficient final solidity and greater amounts of water, which would have a damaging effect on the vicinity of the wall paintings because of known causes.

Despite an exhausting report and proposal for using injecting material no. 3 and 4, they were not chosen, since both contained cement, whose

damaging consequences of efflorescences, particularly in the vicinity of wall paintings, are known.

We decided to use the injecting material based on hydraulic lime NHL5, which we composed ourselves. The number of drilled holes was reduced to a minimum, since it was noticed during drilling of existing cracks that even the tiniest tremors caused additional cracks and shaking (vibrations) of the material in the vicinity of the drilling. Therefore drilling was performed only on the widest crack areas. After drilling through the whole of the thickness of the vault, tightened control tubes were inserted from the underside, which were used to monitor the filling of cracks with the injecting material that was being poured in from the openings above.

Cracks were injected in fields J, K from 2 to 10, as follows:

On 17 May 2005, we began to inject the cracks on the vault in fields J, K from nos. 2-6 – attic.

MIXTURE 9

1 part NHL

0.8 part water

0.25 part lime casein

On 25 May 2005, we began to inject the cracks on the vault in fields J, K from nos. 7-10 – attic.

MIX 10

5 parts NHL5

1 part calcite flour

4 parts water

0.25 part lime casein

Opening	Material in ml	Opening	Material in ml
1	150	11	400
2	170	12	400
3	200	13	150
4	160	14	200
5	/	15	200
6	210	16	150
7	280	17	150
8	230	18	/
9	300	19	150
10	300	20	1

Between opening no. 13 and 14 there was an old drilling hole, into which 300 ml of material was injected.

2. The implementation of the horizontal finishing ring beam

“In order to avoid as much as possible the formation of new cracks on the vaults themselves as well as the window openings on both longitudinal walls in the area of the main nave, it is our suggestion to install a horizontal reinforced concrete ring beam between both purlins, which would be anchored into the basic walling and would connect the area of the main nave along the whole of the border.”

Because this suggestion required anchoring and concrete placement, which represents additional inclusion of water and concrete into the walling and cause of hefty tremors, this option was not selected due to the danger of new damage occurring on the surface of the wall and ceiling paintings.



Figure 33: Removal of darkened whitewashes from the cornice profile under Quaglio's mural. The smaller image shows the layers of the stucco plaster on the profile of the cornice.

¹⁰ KOS 2004.

3. Transverse steel connecting framing constructions

As well as other information, the following is included in the ZRMK report: "Given the direction of the cracks on the vault, as well as the length of the main nave, we deem that it would be very prudent, or even urgent, to implement, besides the listed measures, transverse steel framing constructions of suitable dimensions, which would be anchored into the bordering finishing horizontal ring beam. The mentioned frames, which could naturally be totally reversible, would be executed along the existing roof beams, therefore at an axial distance of approx. 5 m."

On the basis of these recommendations, a project for repairing the roofing was prepared in April 2005.¹¹

4. Repair of the roofing construction

While investigating the vault construction, the experts from ZRMK also checked the wooden construction of the roofing. Their opinion was that it was

necessary to also change approximately half of the purlins and approximately 10% to 20% of the rafters (for these a repair of the lower region along the eave would suffice), whereas all wooden elements that were going to be preserved would have to be thoroughly protected against parasites and wood rot.

As part of the multidisciplinary investigations on the ceiling vault of the Church of St Nicholas, georadar investigations were carried out on 11 June 2004. The aim of the georadar investigations was non-destructive radioscapy of the vault and estimate of the composition and condition of the ceiling vault. The works were carried out by the experts of the ZRMK Institute in Ljubljana. A brief description of the georadar investigations and their results is summarised from the report.¹² The georadar investigations were carried out on the upper side of the ceiling vault of the church construction. Measurements were taken using the SYSTEM SIR-2 georadar system, which is composed from a central measuring unit, a transmitting-receiving antenna and instruments.

¹¹ ELEA IC 2005.

¹² ŽIVANOVIĆ 2004.

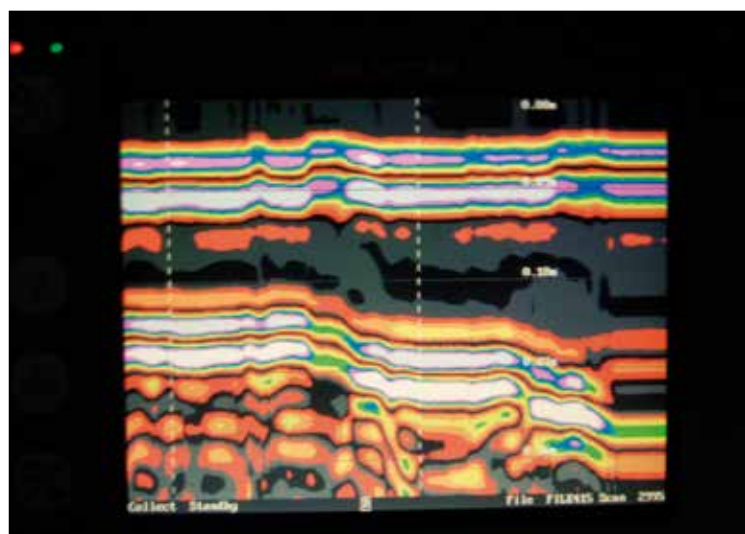


Figure 34: Georadar monitor image of measurements on a part of the vault.

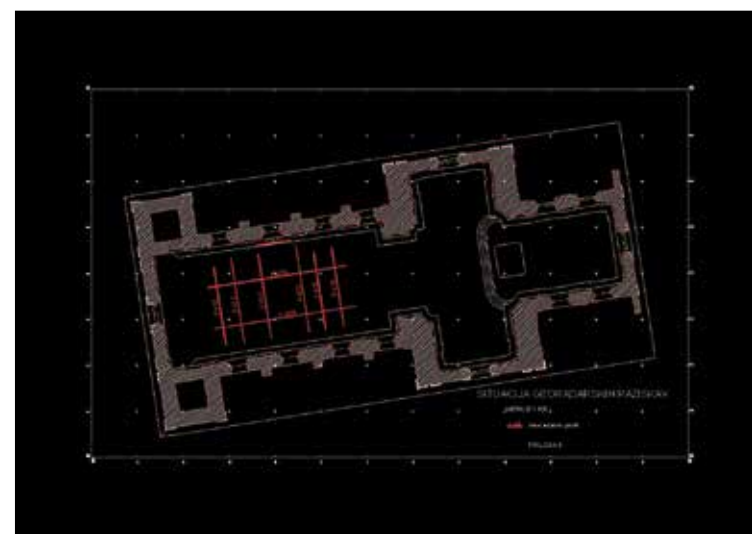
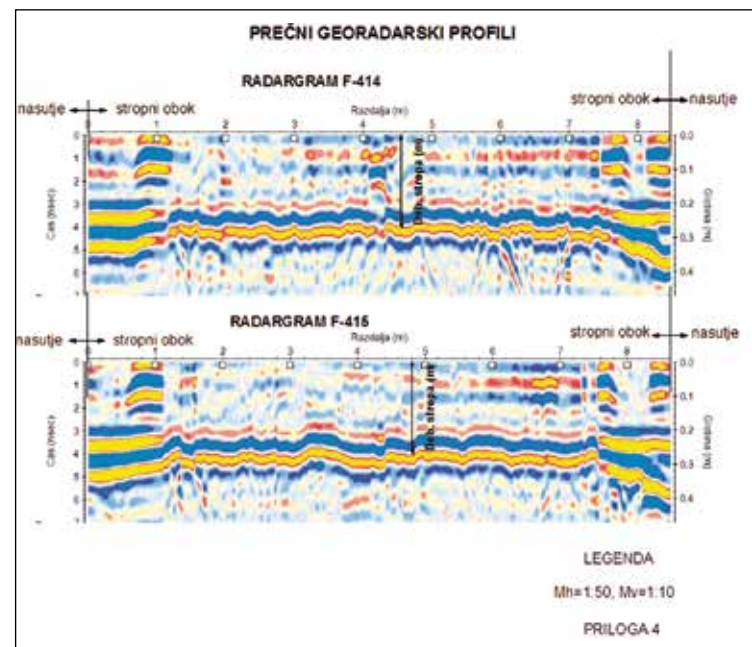
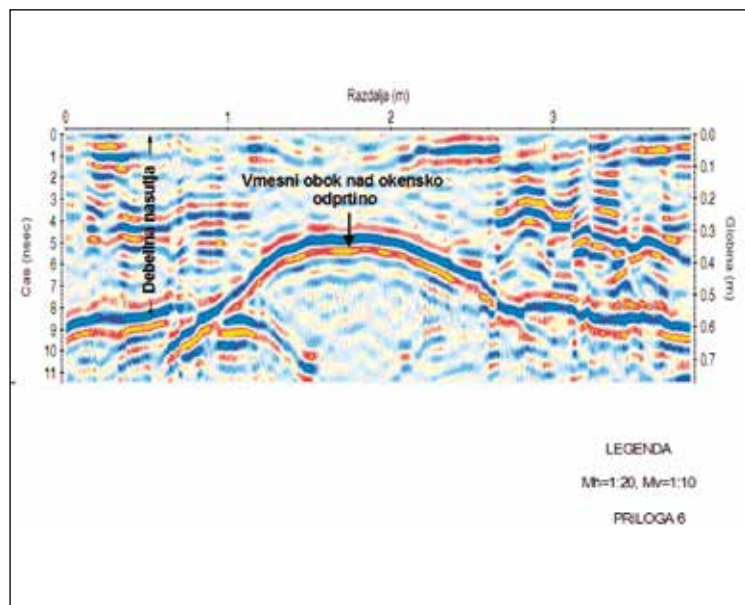


Figure 35: A sketched in course of measurements.



Figures 36, 37: Images of two vault measurements.

Prior to investigative measurements, the electromagnetic properties of the medium (i.e. the ceiling vault) were tested and recording parameters were set. Measurements were taken with a 900 MHz transmitting-receiving antenna in a timeframe of 7 nsec (10-9 sec), which enabled a depth of 0.5 m to be reached. The position of transverse and longitudinal measurement lines was in alignment with the plan (figure 35). Measurements were taken along six transverse and two longitudinal measurement lines. The position of the georadar profiles is shown in Appendix 1, in the scale M = 1:100. In the abutment part of the ceiling, an additional 1 georadar profile was measured (figure 36). All together 9 georadar profiles, with a total length of 90 m, were measured (figure 35).

Georadar investigations excel themselves in the quality of results obtained, high resolution and precision. The results of georadar investigations are produced in the form of radargrams (georadar records), which represent continuous cross-sections measured along straight lines. The results of evaluations of georadar data are shown in figure 37.

Included in the appendix are the evaluated georadar records, which represent all the typical findings of georadar measurements. On all these georadar records, the horizontal electromagnetic limit, which shows the thickness of the ceiling vault (yellow reflection), is clearly visible. When the electromagnetic wave breaks through the whole of the thickness of the vault, it reaches a sharp electromagnetic edge (the interior side of the vault – the air) and is reflected back from this edge, registering as a strong electromagnetic reflection.

Reflections which are seemingly deeper than the given thickness of the ceiling vault are chaotic reflections from within the space of the construction. Electromagnetic waves in fact continue to spread through the interior spaces when they reach the edge of the interior vault – the air. Therefore all reflections that are seemingly deeper than this edge represent an irrelevant disturbance.

Reflections that are seemingly "shallower" than the thickness of the ceiling vault or edge: the interior side of the vault – the air, provide useful information on the state of the examined vault.

On all transverse georadar profiles (Appendices 2 to 4) at a distance from 90-100 cm from both edges: ceiling vault – abutment, vertical reflections were clearly seen (repeating yellow and blue patches from a depth of 0 to 0.25 m). On the basis of georadar records it was found that the ceiling vault is composed of different construction material and has most probably been built out of stone material from the edge: abutment (springing) – vault to approximately 1 metre, whereas the middle part has been made out of brick. This could also be assumed from the various speeds of electromagnetic waves. In the area of the supposed stone part of the vault, the speed of the waves was greater, which suited the stone material (e.g. limestone), in comparison to the middle part built from brick.

Figure 36 shows a georadar record taken from the flat area of the ceiling. The image clearly shows the position of the intermediary vault above the window opening. In the rest of the area, the common thickness



Figure 38: Testing probe in the north-western corner of the attic with marked arrows indicating a large crack on the left and detachment of the masonry.



Figure 39: Probing of the abutment.

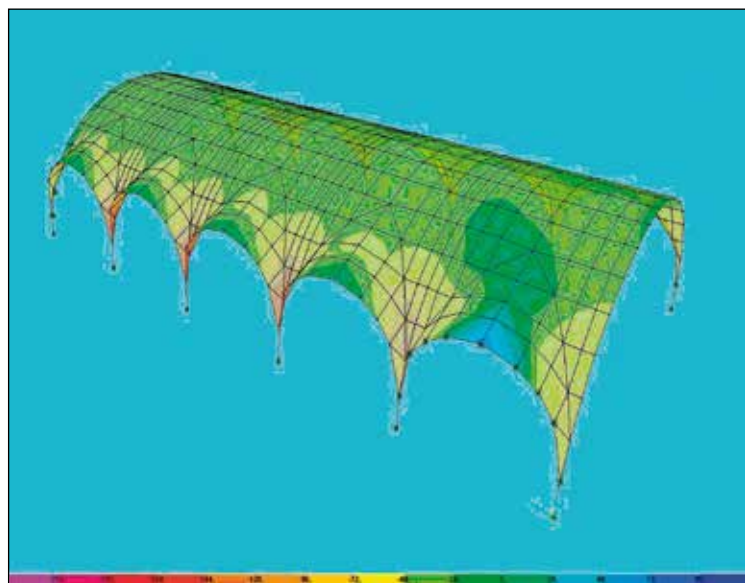


Figure 40: Depiction of the abutment load proceeding in a vertical direction.

of the ceiling measures approximately 60 cm. The sporadically arranged electromagnetic reflections (yellow and blue patches) indicate the heterogeneous composition of the abutment.

The results of evaluations of georadar data drew attention to the various degrees of damage to the ceiling vault, which was built from one construction material (stone) from the edge of the vault up to a metre and another material in the middle (brick). The abutment in the flat part of the ceiling (thickness of 60 cm) is according to the results of georadar investigations of a heterogeneous composition.

The RC restoration team performed an investigative excavation in the NW corner of the attic. The top layer of the abutment (approximately 30 cm) was composed of crushed bricks, roof tiles, stones and wood parts (figure 39).

In figures 38, 41 and 42 the removed top part of the abutment can be seen. We searched for possible causes for the hefty damage that had occurred on the plasterwork and wall and ceiling paintings, which was at its most intense precisely here, in the corner, on the wall of the north bell tower adjacent to the western wall. It is clear that this area represented a difficult terrain throughout, which can be seen from the additional building work and corrections to the roofing construction. In this part, particularly on the left, western wall, the longest and widest cracks were



Figure 41: Testing probe after the temporary removal of the abutment.



Figure 42: The anchoring in the roofing construction.

noted, one of many can be also seen in figure 38 (left arrows). That the load part between the northern wall (bell tower) and vault was constructed later can be seen from the cracks at the junctions (right arrows). Above this sturdy load construction the already mentioned layer of broken roof tiles, remnants of wood left over from construction or repairs to the roofing, small stones and dust, as well as numerous other substances including pigeon excrement, collected with the years. This layer functioned as a moisture catcher with the light leakage of water since the small amount of water was quicker to evaporate from the abutment than to protrude into the brick construction of the vault. With heavy leakage, however, the water on its way through the listed materials dissolved various substances, which impregnated the plaster between and under the brickwork, and the bricks themselves of course. Therefore some typical damage to the intonaco and colour layers occurred, which will be described in more detail later. In our excavation, it was interesting to discover the system of construction of the lower, starting part of the vault, where long flat stone boulders had been used (figure 41). The probability that the lower, starting point of the arch (springing) had been constructed out of stone was, on the basis of georadar probes, already addressed by the contractors of the probing in their report. The building work (a kind of anchoring) to the lower parts of the wooden roofing after the completed vaulting

additionally aided the stability of the structure as a whole (figure 42). With the eventual secession of these anchors (rotten beams), the stability and cohesion with the walling are severely compromised of course.

The restorer needs to get to know the vault paintings from both sides, the underside, the viewer's side, and the upper side, where visitors usually do not venture. Finding out that the colour layer has flaked off due to years-long water leakage or consequential formation of salt crystals does not suffice, we must be certain that the cause of these anomalies has been removed. If not, restoration treatment on such damage merely becomes an expensive short-term cosmetic correction. A visit to the attic of the building housing the wall and ceiling paintings is highly recommended, even vital, both for understanding the placing and construction of the vault, which is the support to the wall and ceiling paintings, as well as for making potential discoveries of various anomalies and removal of damage. Very useful is also a precise draft of the attic area, how it is supported by the vault, marking and measurements of consolidation points, exact locations of holes in the construction (holes for chandeliers), since the position of these holes, their shape and material of production help us understand the causes of damage to the plasterwork on the underside of the vault (cracks around holes due to the swinging of the chandelier).

These supporting points, together with the marked arched reinforcing supports, are of great help when investigating the causes and consequences of any water leakage. The thermographic record in figure 43 shows the central part of the vault after being heated with warm air. The red colour denotes areas (thicker walls) that accumulated heat, whereas the blue colour shows the surfaces that are thinner in construction and therefore lose heat more quickly. There is only a difference of 1.1°C between the warmest (red – 13.2°C) and the coldest areas (blue – 12.1°C). From this example it can be seen that the surfaces of the vault respond differently to changes in temperature, causing the materials to constrict and expand, therefore producing cracks. A layer of thermal insulation was placed onto the vault in order to minimise these differences in temperature (February 2006; figure 44).

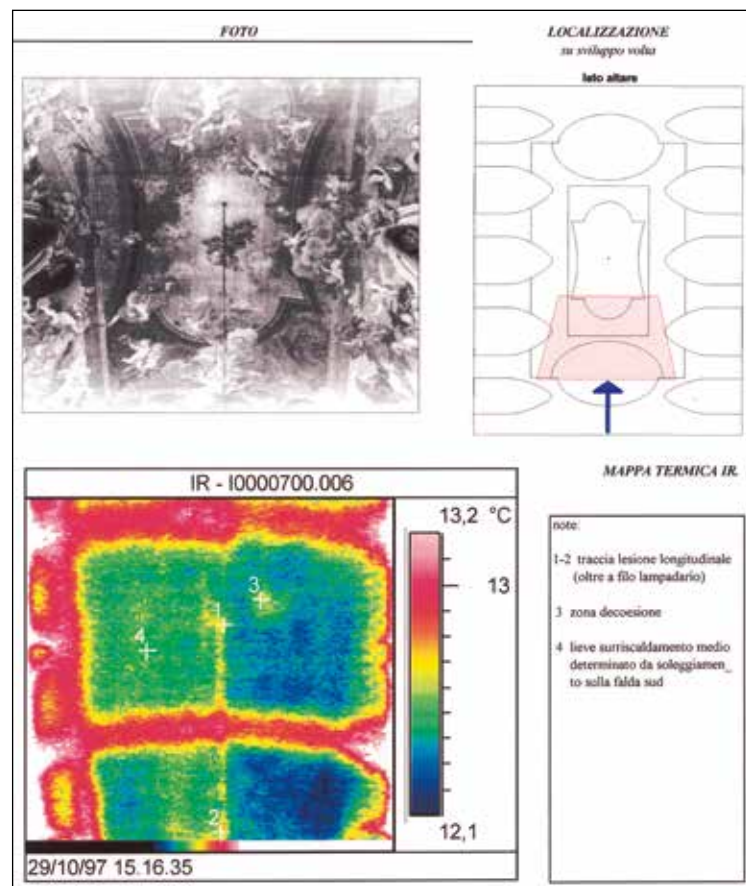


Figure 43: Thermographic record of the vault – coloured red are the reinforcing arches and the edge of the abutment above the springing of the vault (SER.CO.TEC 2006).



Figure 44: Applying thermal insulation to the vault.

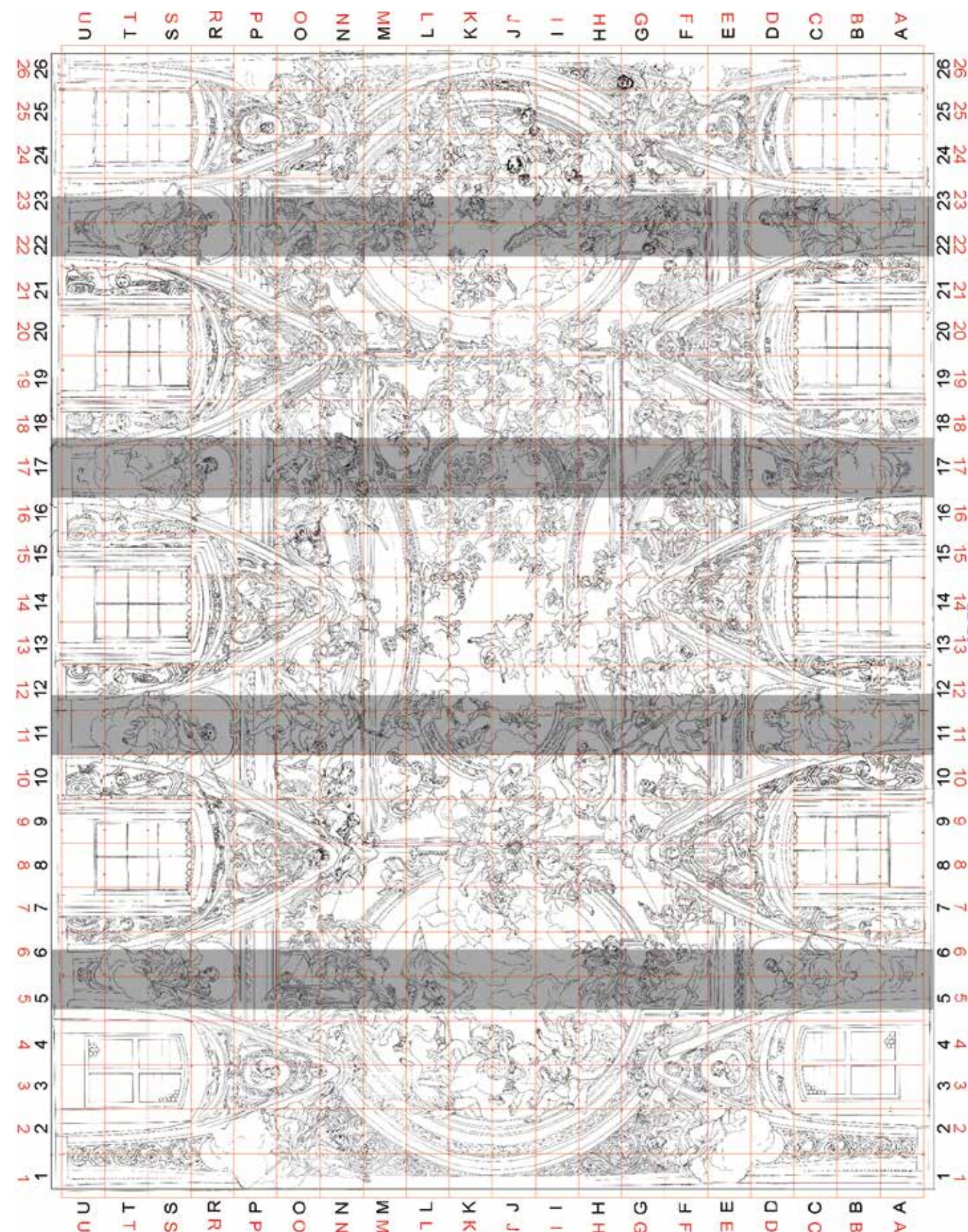


Figure 45: Marked position of the reinforcing arches in the vault construction. The drawing is important for the analysis of the locations of damage on the wall and ceiling paintings.

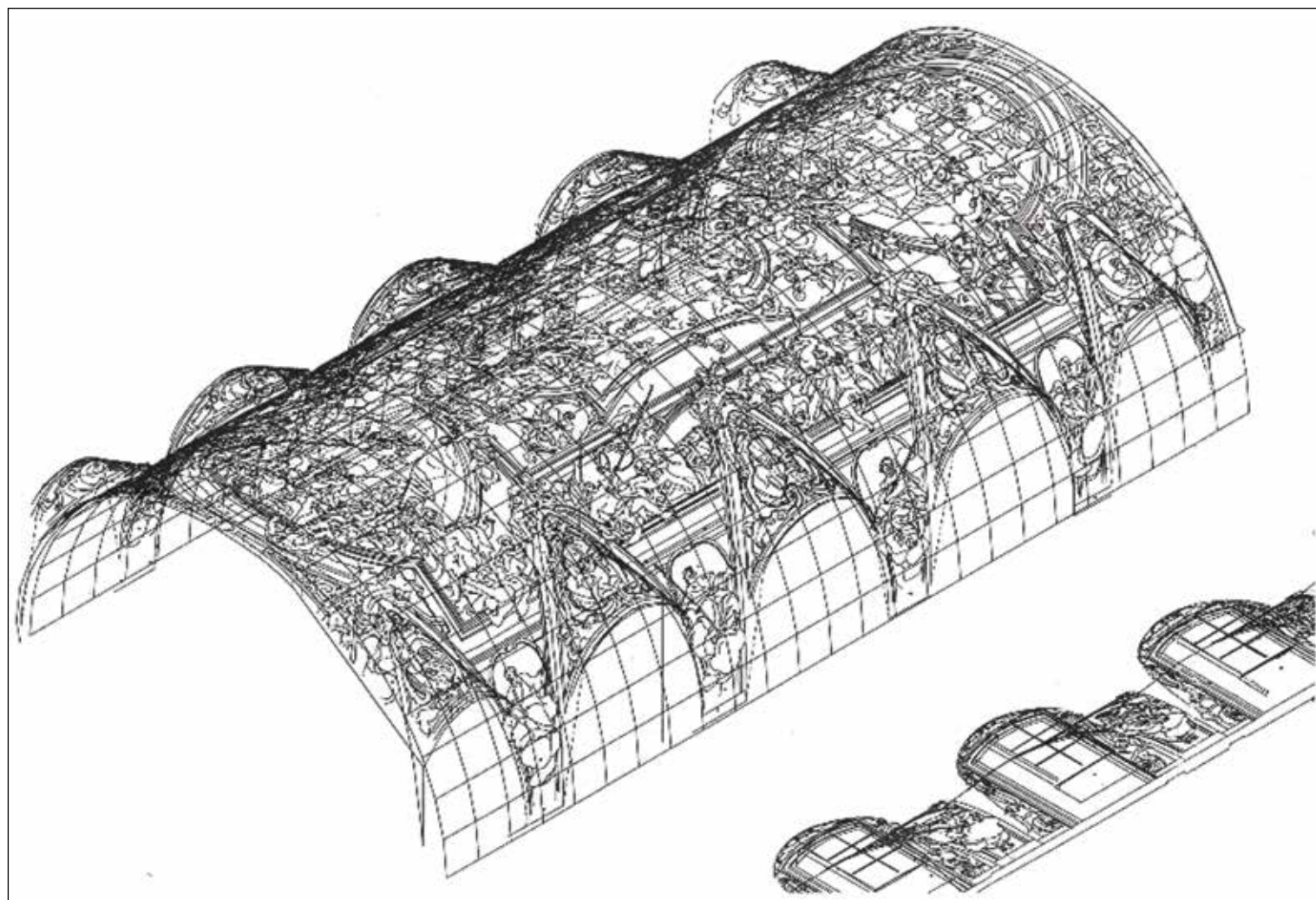


Figure 46: An interesting photogrammetric draft of the vault which, however, proved inadequate for use because of optical shortening.

PREPARATIONS FOR THE FOUR-YEAR-LONG RENOVATION PROJECT

A truly special scaffold was erected for the uninterrupted work of restorers covering 580 m² of painted surfaces on the vault and western wall (figure 46) of the Cathedral of St Nicholas in Ljubljana, which took several years to complete. It was actually a flat platform upon which all activities related to the renovation of the wall paintings could proceed. Artist Giulio Quaglio painted these upper surfaces of the nave during 1705 and 1706, thus completing his oeuvre of paintings on the exterior, transept and presbytery, which he had begun in 1703.

In order for the restorers to reach every single painted surface area (figure 47), at a height of 20 m, measuring 25 m in length, a restoration platform was set up at a height of 13 m (figure 51a – red line, and figure 51b). In order for the structure of the platform to withstand additional scaffolds and equipment, wall bearings were prepared (figure 48) into which strong anchors were placed (figure 49). Walking boards with sound and dust protection were attached onto the upper side of the anchors, whereas plaster boards (figure 50) were fixed to the underside so that visitors to the church were spared the sight of the platform construc-

tion. Entry to the platform was possible via the staircase in the choir. The lighting of the work area was accommodated to the spectre of daylight with the selection of suitable portable lights. Besides the installation of running water for cleaning up to the highest point of the platform, the cargo lift was also indispensable. The consumption of electricity for lighting, ventilation and heating during the winter months reached as high as 18 KWh at times, making it necessary to prudently allocate power across the whole of the platform. The main moveable scaffold (figure 52) covered approximately a fifth of the length of the 25 m in all, which was the length of the vault. It was pushed along manually or by using a winch. For individual, harder to reach areas, the scaffold was made higher (windows, lunettes). Because of the organ construction a fixed tube scaffold had to be set up on the western side, with the moveable scaffold being able to slot in to its level perfectly. Work on the western side was made more difficult due to the fixed arrangement of tubes.

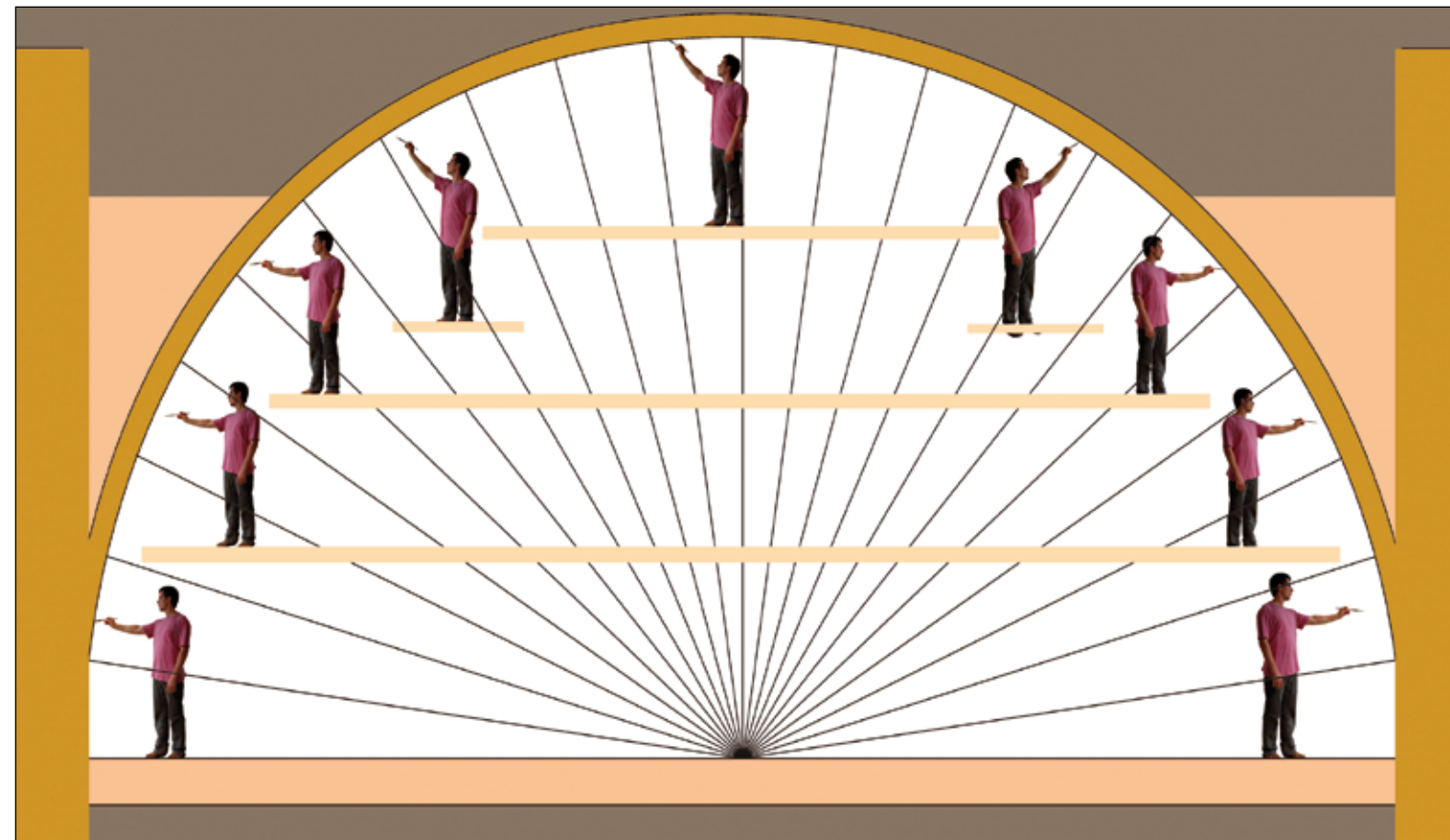


Figure 47



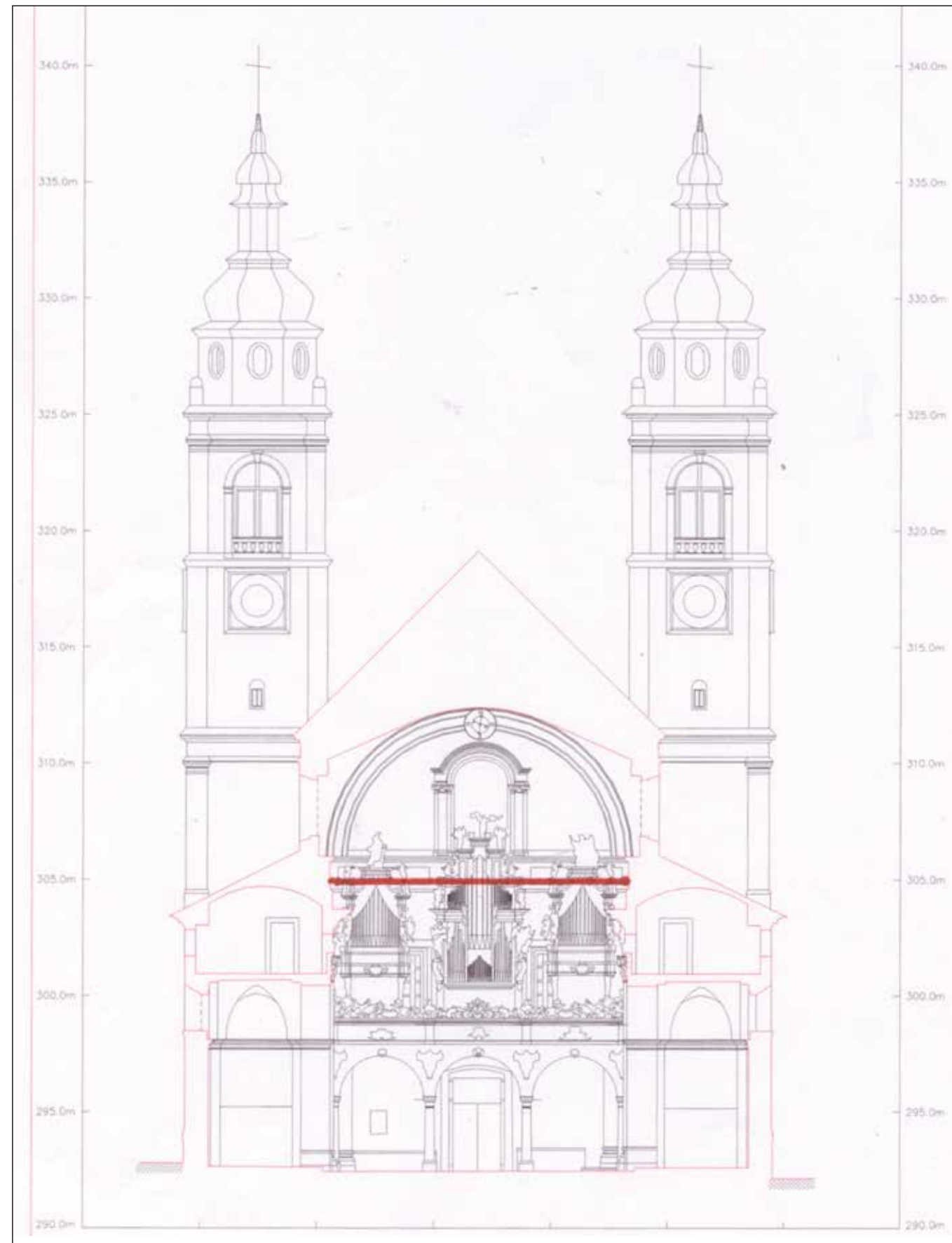
Figure 48



Figure 49



Figure 50



Figures 51a and 51b: The position of the restoration platform at a height of 13 metres.



Figure 51b



Figure 52: View towards the east: the moveable scaffold on the restoration platform.



Figure 53



Figure 58



Figure 59

INITIAL SCIENTIFIC AND ARCHITECTURAL INVESTIGATIONS

1. Thermography, photogrammetry, measurements of humidity, temperature and temperature-related expansion

Non-destructive investigations of the vault and western wall of the Church of St Nicholas were already carried out in 1997 by means of photogrammetric drafts and thermographic investigations, which were supplemented by results obtained from measurements using a more modern thermographic camera in 2003 (figure 53). In Figure 54, the detection of the wide central crack on the vault can be seen, whereas figure 55 shows all thermographic records of the vault and western wall. To aid comparison Figures 56 and 57 have been added, which illustrate the region of the reconstructed and fallen off wall and ceiling painting on the junction between the vault and western wall. To monitor the stability of the building construction and perception of eventual changes, a system of measurement points was implemented by using sensors to measure the micro-stretching of the cracks of the nave vault (figures 58). In order to monitor micro-climatic conditions, sensors were implemented to measure humidity, temperature and temperature-related expansion (figure 59). The locations of individual sensors are denoted in figures 60, 61 and 62. To monitor temperature changes between the interior and the attic, the exterior side of the vault, measurements were taken of relative air humidity under the vault, air temperature under the vault and the surface temperature of the interior side of the vault before installation of thermal insulation and after, on the attic side. It can be seen from the measurements that the difference in the temperature measured on the surface of the vault in the interior and the attic was substantially reduced, which would certainly reduce the likelihood of new cracks forming due to expansion of material caused by big temperature fluctuations.¹³ Before thermal insulation was installed, we ourselves experienced the transfer of temperature across the vault into the interior

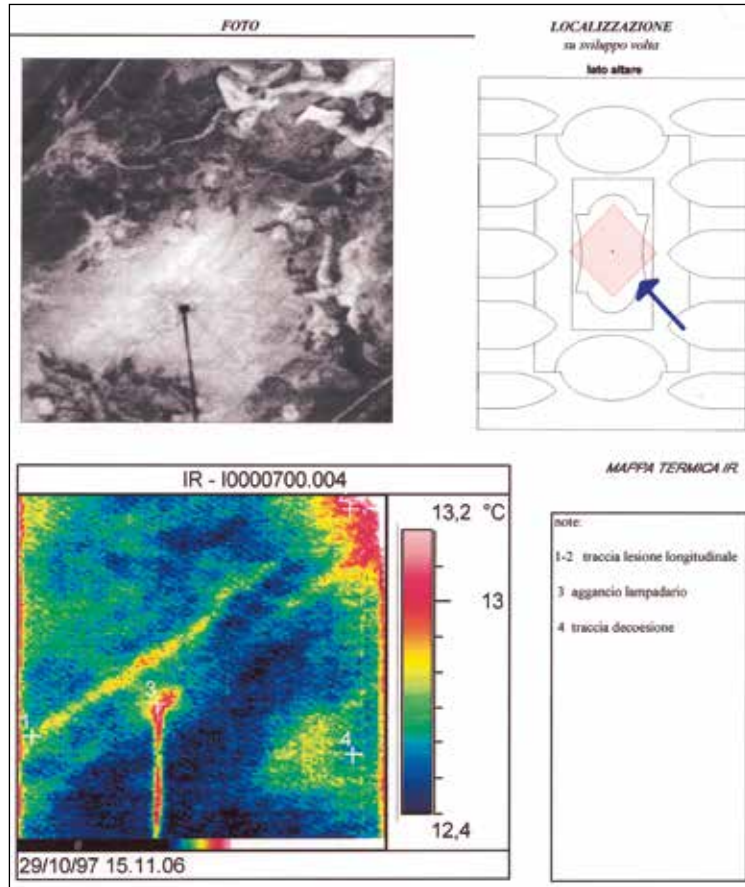


Figure 54

¹³ Poročilo 2006.



Figure 56

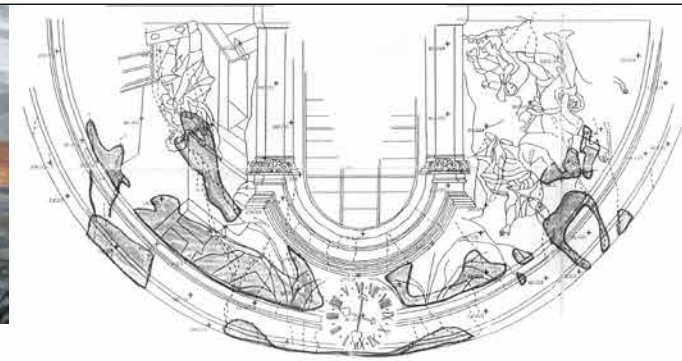


Figure 57

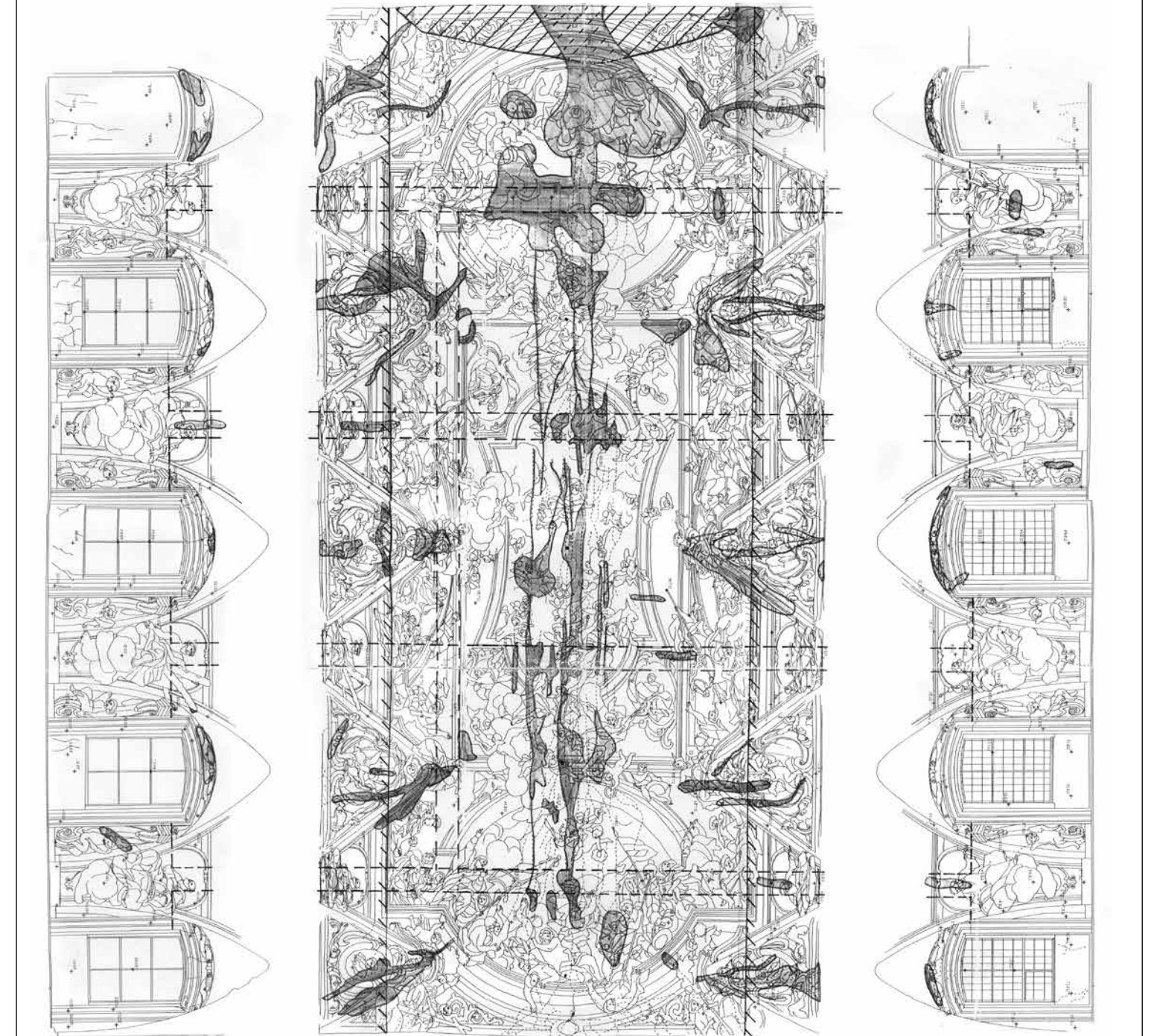


Figure 55

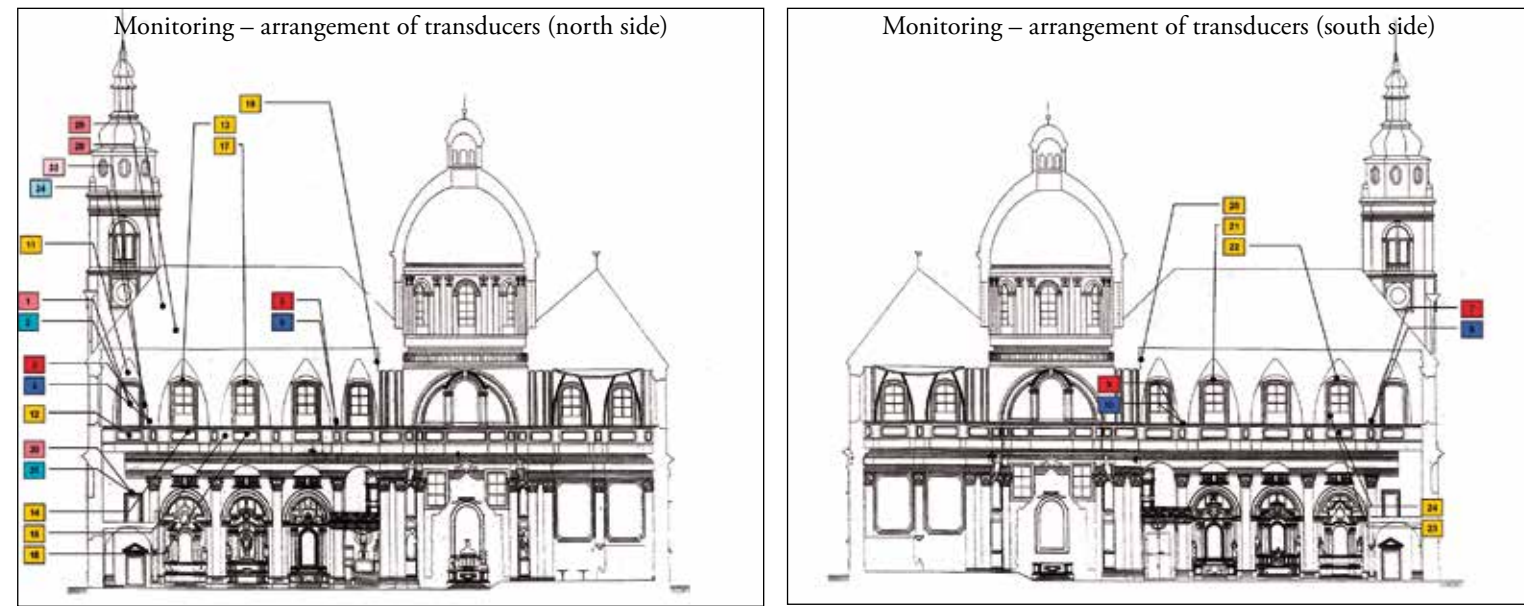


Figure 60: Key
 Fissurometer (yellow square)
 Wall temperature (red square)
 Wall moisture (blue square)
 Space temperature (pink square)
 Space moisture (cyan square)
 Surface temperature (red vertical lines)
 Surface moisture (blue vertical lines)

Figure 61: Key
 Fissurometer (yellow square)
 Wall temperature (red square)
 Wall moisture (blue square)
 Space temperature (pink square)
 Space moisture (cyan square)

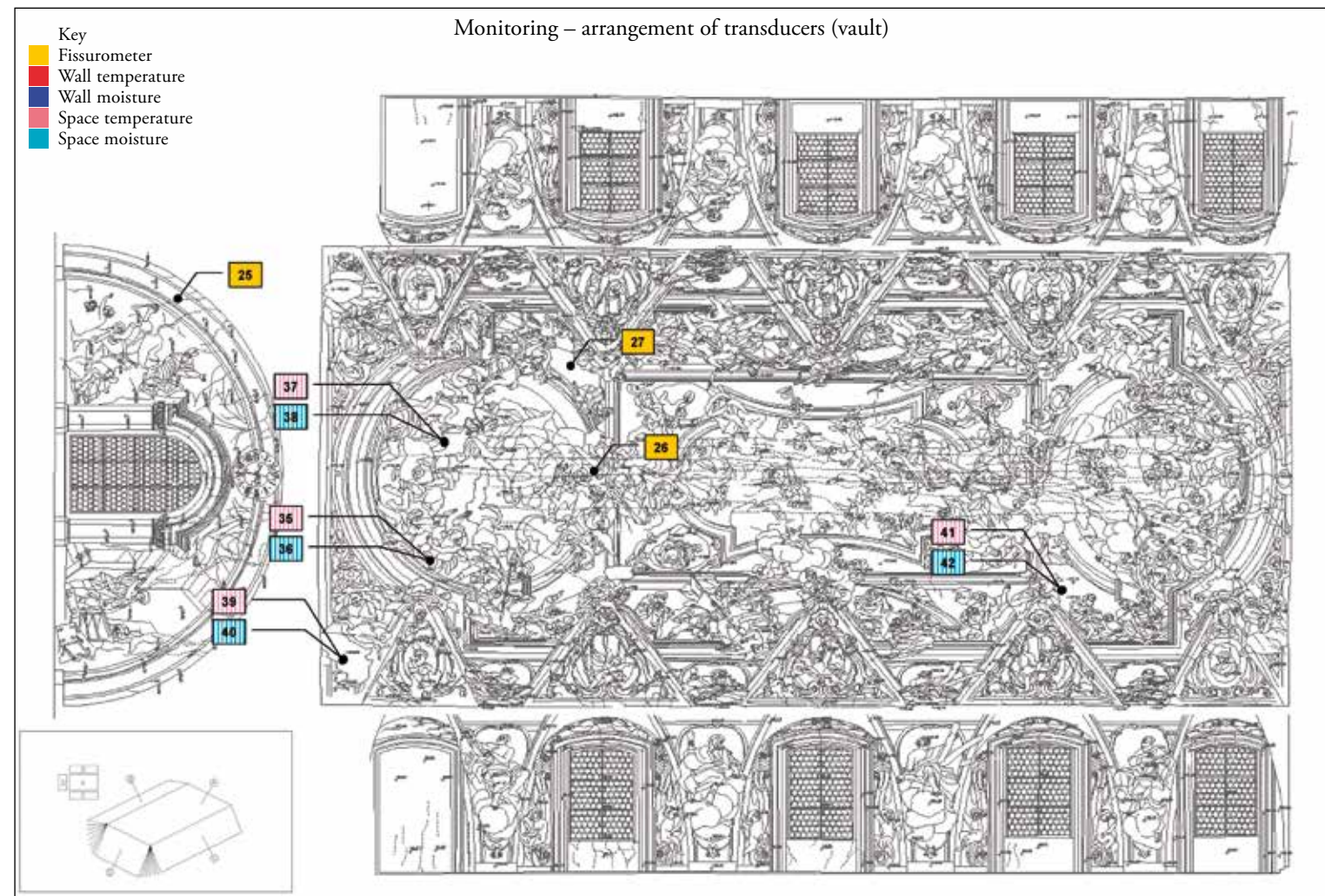


Figure 62



Figure 63



Figure 64

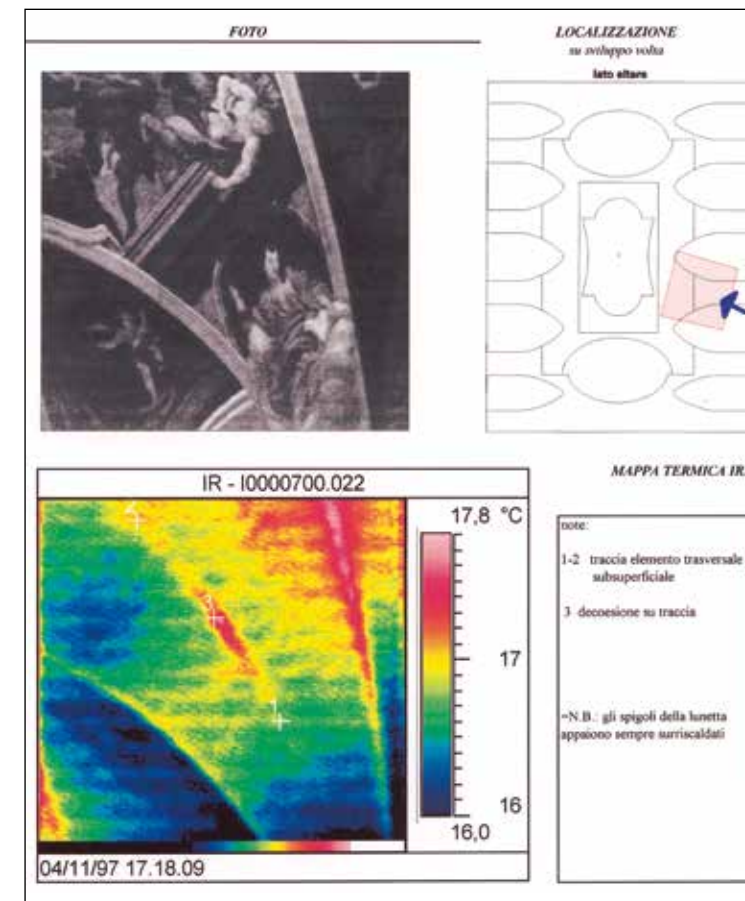


Figure 65

since the vault, with its enormous surface, but relatively thin wall as thick as a brick (approximately 20 cm), acted like an enormous cooling body in the winter, and a heated panel in the summer. Since the construction of the restoration platform partitioned and divided the space of the nave into a lower, larger, and upper, smaller part, this smaller area of air above the platform was quicker to absorb, be it, the cool or warm air.

The thermographic record (figure 65) of the area depicting St John the Evangelist at the junction between the western wall going into the vault shows a vertical line in the region where there are no special points to note in other locations (other depicted Evangelists). When this surface was examined, a large region of unusually thick cracked plaster with an old fill (figure 63), covered up by an unsuitable retouch, was discovered. After removal of the fill material, several hand-wrought nails (figure 64) were found under the plaster in a vertical line, firmly nailed into a fairly thick piece of wood. The dimensions of this plastered wooden object could not be ascertained, since any greater probing would have caused damage to the original wall and ceiling painting. It could be the remains of the wooden construction of the shuttering of the vault's construction.



2. Scientific/chemical investigations

At the onset of the project, before cleaning was begun, samples of pigments and support of the wall and ceiling paintings were taken for subsequent analyses and later studies of Quaglio's painting palette.¹⁴ In such a way there are samples stored in the RC documentation that do not contain possible additives or coatings, which would be applied to the surface of the wall and ceiling paintings during restoration-conservation work performed by the RC team. Before the removal of surface impurities, subsequent coatings and retouches was begun, an investigation was conducted.¹⁵ To monitor the effectiveness of the removal of unsuitable coatings and check the successfulness of cleaning, numerous samples were taken (figures 66, 67) and analyses produced.¹⁶ Special investigations were used to determine the condition of the colour layers on the wall and ceiling paintings on the vault¹⁷ and western wall.¹⁸ Before a decision was taken as to the selection of appropriate binder for retouching Quaglio's wall and ceiling paintings, artificial ageing of the binders usually used in wall painting as well as further a field was performed.

The decision on the choice of binder to replace the original lime binder was no easy task. Even if the decision had been accepted to retouch or just use several coats of retouch with lime whitewash, this would not have ensured the same ground that Quaglio had in his work. The application of a coloured lime whitewash onto a three-hundred years old, heavily carbonised ground, containing the most varied remnants of coatings from

¹⁴ NEMEC, FISTER, 21 November 2002.

¹⁵ ROPRET, 20 November 2003.

¹⁶ ROPRET, 20 November 2003.

¹⁷ ROPRET, 6 January 2004.

¹⁸ ROPRET, 25 February 2004.

Figures 66, 67: The removal of samples for analyses.



Figure 67

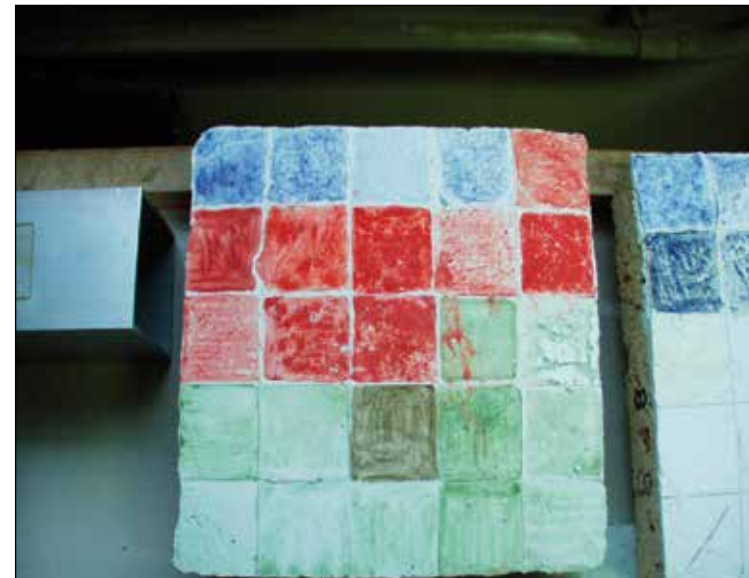


Figure 68: The condition of binder samples after artificial ageing.

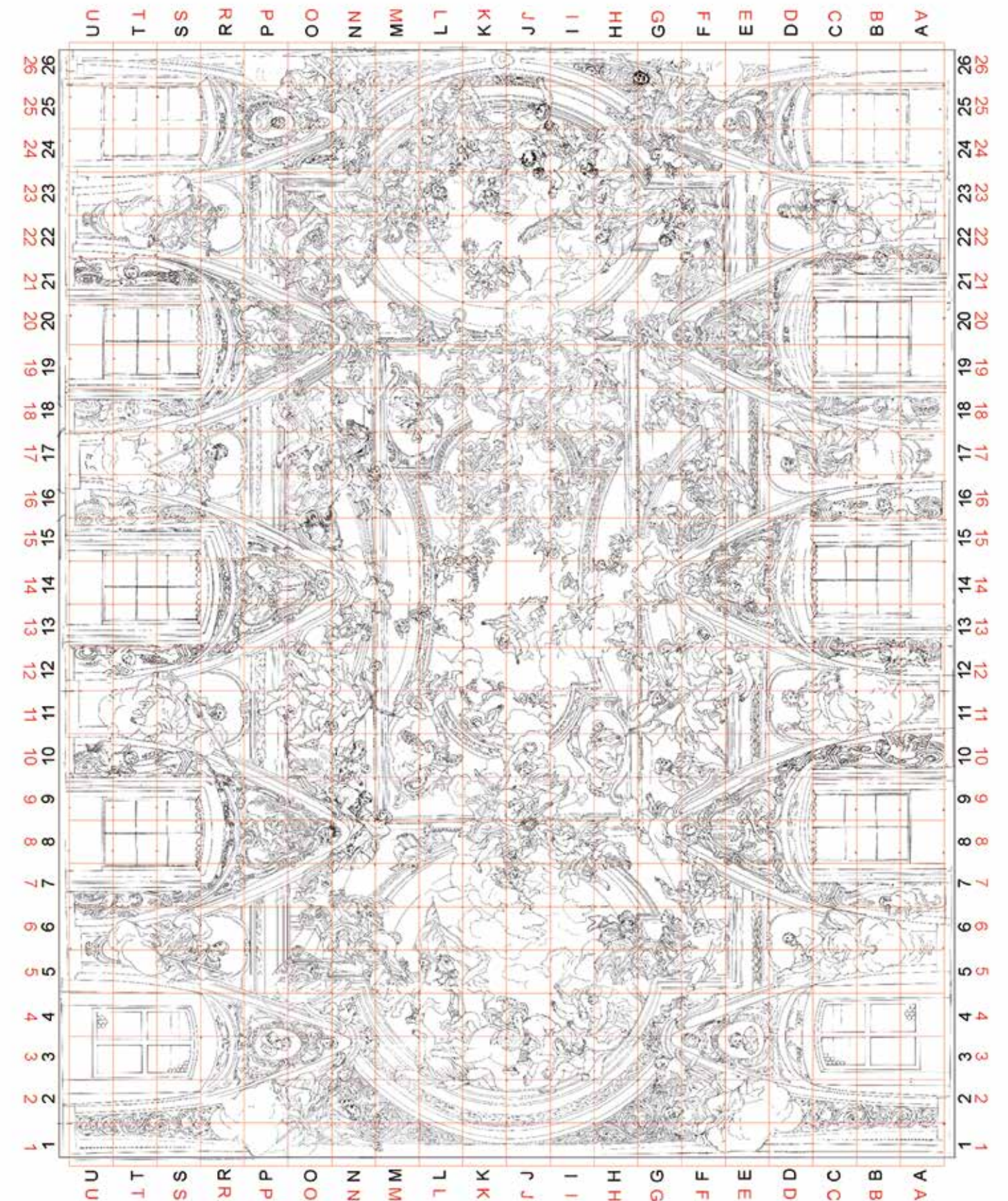


Figure 69: Flattened and stretched image of the vault painting marked by quadrants.



Figure 70

previous restoration procedures, does not set off the same chemical-physical processes that take place when this type of whitewash is applied onto fresh intonaco. Three-hundred years ago, the slowed down drying process of the intonaco also added to the quality of the binding of the pigments in the calcium carbonate layer, since the latter was applied to the still wet lower plaster layers and the recently built vault.

As can be seen from the numerous images in the publication, there were thousands of little damaged areas across the whole of the surface before treatment, where only the topmost part, usually a fine layer of pigmented whitewash, had fallen off. Filling these numerous areas of damage with lime paints, which change shade upon drying, would have proved to be extremely arduous and time-consuming. The choice of binder for retouching Quaglio's wall and ceiling paintings was made on the basis of results of artificial ageing of certain types of binders (figures 68), which are fairly frequently used in the restoration of wall paintings. A more detailed description of the ageing procedure and investigation results were published.¹⁹

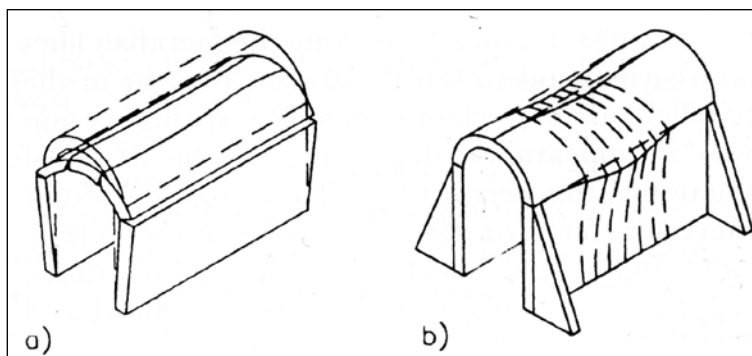


Figure 71

TYPES AND CAUSES OF DAMAGE TO THE PLASTERWORK AND WALL AND CEILING PAINTINGS

Since the wall and ceiling paintings are inextricably joined to their support, any change, movement, expansion or contraction in the support also shows up on its surface. Most of these occurrences take place slowly, year after year, almost unnoticeably. Some, however, are unpredictable, sudden and destructive. Damage that occurs with expansion and contraction of materials caused by high and low temperatures can certainly be listed into the first group, whereas the second group includes events such as earthquakes and other natural disasters. The earthquake of 1895 left a great deal of damage on Ljubljana's buildings – many had to be demolished due to extensive cracks. The earthquake did not spare the Church of St Nicholas either, since it caused new, or increased the already existing longitudinal cracks on the nave vault. In the region above today's organ, along the junction with the western part of the roof, the only larger piece of plaster with Quaglio's wall and ceiling painting fell off. During renovation work in the beginning of the 20th century, it was replaced by a plaster of a much coarser structure than the original. What could also be noted was a fairly faithfully (at least in terms of drawing) produced reconstruction of the original ornamental mural. The renovated part darkened with time (cf. figure 56, 57). The newer coarser plaster was also applied in the region of St Matthew's extended arm, from the wrist upwards, (location on the grid between M1 and N1) where, however, the reconstruction was performed rather ineptly. In figure 70, a part of the reconstructed mural can be seen (condition before treatment of the Restoration Centre team). As a point of interest let us mention that our restoration team was also shaken on the platform by a minor earthquake in July 2004, during which some small parts of plaster dropped down from the cracks on the vault. Figure 71a shows the occurrence of longitudinal cracks on the barrel vault. These cracks always occur on the apex of the vault, usually on the left or right from the capstones or bricks, and parallelly along the whole length of the nave (figure 72). The causes for this, besides the already mentioned movements (expansion, contraction), can also be the outward horizontal movements of the walls, due to which the vault dips in the middle. If the building is supported by pillars, cracks develop in previously uncracked areas (figure 71b).²⁰ At the end of 2002, before the beginning of conservation-restoration work, the longitudinal cracks along the whole of the length of the main nave were – besides the three larger damaged areas caused by leakage – the most noticeable damage. In fact there was extensive damage also on the

¹⁹ ROPRET, ZOUBEK, SEVER ŠKAPIN, BUKOVEC 2007, pp. 1148–1159.

²⁰ CROCI 1998, p. 61.



Figure 72: Filled cracks before retouching.



Figure 73: The cross-section of the vault and roof: most of the vault is constructed from bricks, only in the region resting onto the wall of the nave were stone slabs added to the springing, which we discovered after the temporary removal of the abutment (image top left). The abutment in the illustration is denoted by the blue colour. The majority of the weight of the wooden roofing construction is spread onto both loadbearing walls, exerting pressure onto the vault only tangentially across the arched supports, thus decreasing the splaying out of the vault. The image above shows a part of the roofing which is anchored into a part of the abutment, thus forming a kind of horizontal bond. Due to the repeated contractions and expansions of the inbuilt material over many years, as well as movements caused by earthquakes, deep longitudinal cracks formed at the top of the vault across the whole length of the nave (figure 74).

whitewashes and plasterwork in the north-western corner above the organ, however, this was less noticeable to the visitors of the church because of the organ construction and dimmer lighting in this part of the nave (there are no windows here because of the two bell towers). The most extensive, however, was the layer of impurities, basically dust and soot, that had slowly taken hold on the surface of the wall and ceiling paintings over the long years, particularly abundantly in the cracks, on the coarse, raised damaged parts of the plasterwork and colour layers, as well as in places where the crystallization of soluble salts had occurred.

Most damage to wall paintings does not occur due to poor quality production or use of inadequate materials, but because of outside environmental influences.

There are many causes for the damage occurred on the wall and ceiling paintings on the vault and western wall of the Cathedral of St Nicholas, and these interlace. The natural disaster, such as the earthquake of 1895, produced numerous great, as well as small areas of damage, throughout the construction of the church. If the earthquake caused the heavy cracks on the western wall, as can be seen in figures 76 and 77, then it is quite possible that some roof tiles were moved or even fell off. Whether the church building was fixed immediately or at a later date, can only be guessed at. The fact remains that some of the greater damaged areas occurred precisely due to the evident disintegration of the lime binding exposed to the continuous effects of moisture. The two cracks in figures 76 and 77 are shown after removal of the old, unsuitable fill material.



Figure 74: Wide longitudinal cracks on the apex of the vault.

The formation of salt crystals on the surface of the murals made the otherwise relatively smooth ground much coarser in structure, on which dust, soot and other impurities had begun to collect (figures 78, 79). The extensive lifting of the colour layer together with the plasterwork underneath in the region of the northern walled-in window (figure 80) demonstrate the persistent trickling of meteoric water at the junction of the roof and the northern belfower. The crack (figure 81) is filled with soot, which indicates air currents through the vault.

The most typical type of damage to the plasterwork and murals, which could be seen by an attentive observer from the ground of the nave and from a distance of twenty metres are presented in figures 82/1–87/6. Their actual locations within the grid are shown in figure 88. The first four images (82/1–85/4) lie on the northern side, whereas the last two (86/5 and 87/6) can be found on the southern side of the vault. In figure (7) – inside figure 88 – a severe crack is denoted in red. This is the only large transverse crack on the vault and is a continuation of a crack that runs across the whole of the exterior as well as in the interior, in the direction of N-S. No special points were uncovered by measuring the expansions on this crack, however, the experts drew attention to it nevertheless.

The damage in the first three images was caused by leakage of meteoric waters over an extended period of time. Here, besides the colour layer, also the plasterwork underneath began to fall off. The fourth (figure 85/4), which is less damaged, shows the typical darker traces of moisture seeping in due to different levels of conductivity in the construction of the vault and consequential efflorescences and deposits of dissolved matter on the surface of the wall and ceiling paintings.²¹ The fifth and sixth images lie on the opposite, southern side of the vault and at first glance seem less damaged than the previous ones. In figure 87/6 a similar pattern of filtering through the brick construction can be noted as in figure 85/4, although in this case the plasterwork with the mural has also begun to flake off. In figure 86/5, the figure of the virtue is almost in its entirety rimmed in white, which is caused by the flaking of the fragile, poorly carbonised particles on the edge of the giornata, and is not so much a product of leakage. From this rim outwards, however, the consequences of leakage can be seen in the form of a darker border, from behind which water has clearly trickled out, coloured by a dissolved mixture of matter which it accumulated along its course across the wooden roofing. The flaking of colour particles is pronounced in the lower third of the depicted figure.

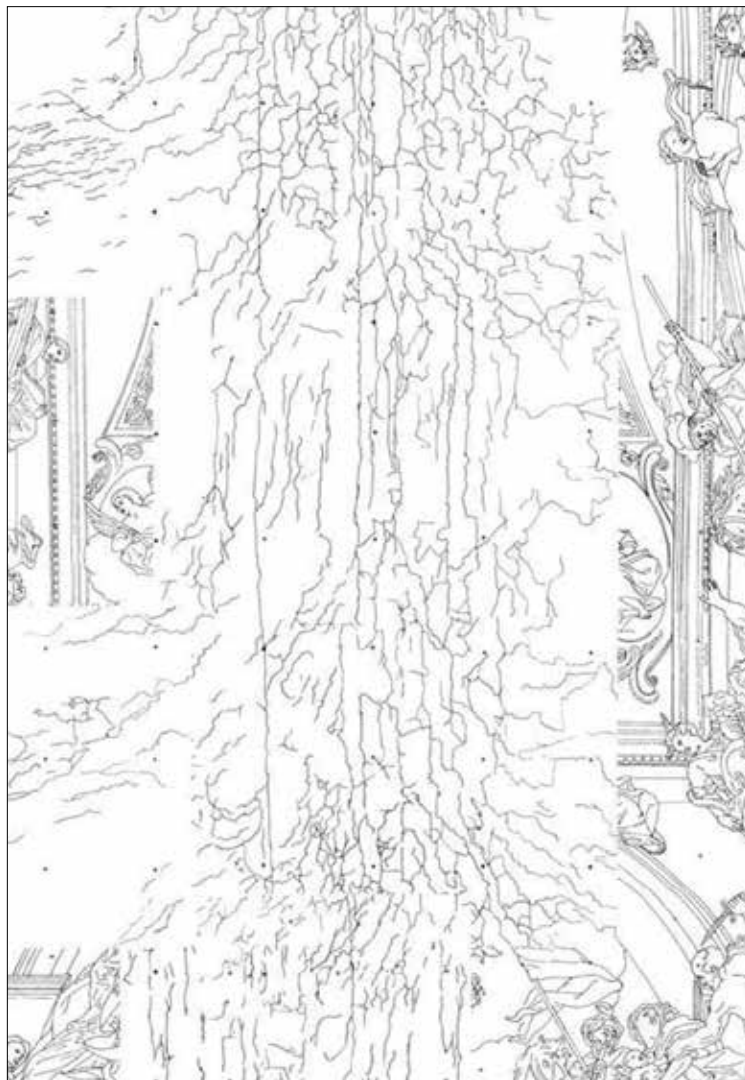


Figure 75: Graphic illustration of the course of the cracks on the vault.

²¹ ARENDT 1987, p. 32.



Figure 76



Figure 77



Figure 78

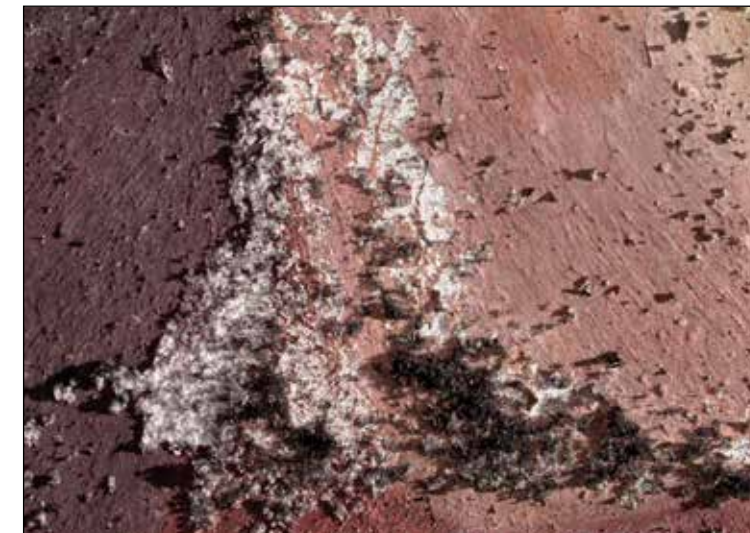


Figure 79



Figure 80



Figure 81



Figure 82/1



Figure 83/2



Figure 84/3



Figure 85/4

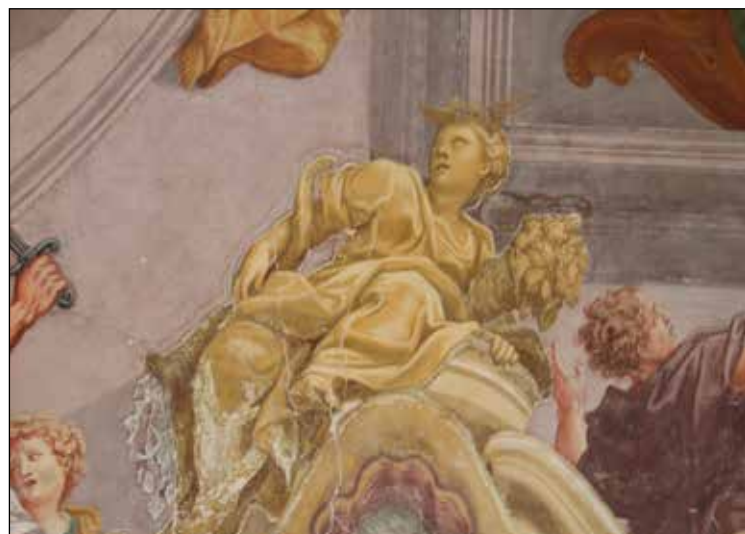


Figure 86/5



Figure 87/6

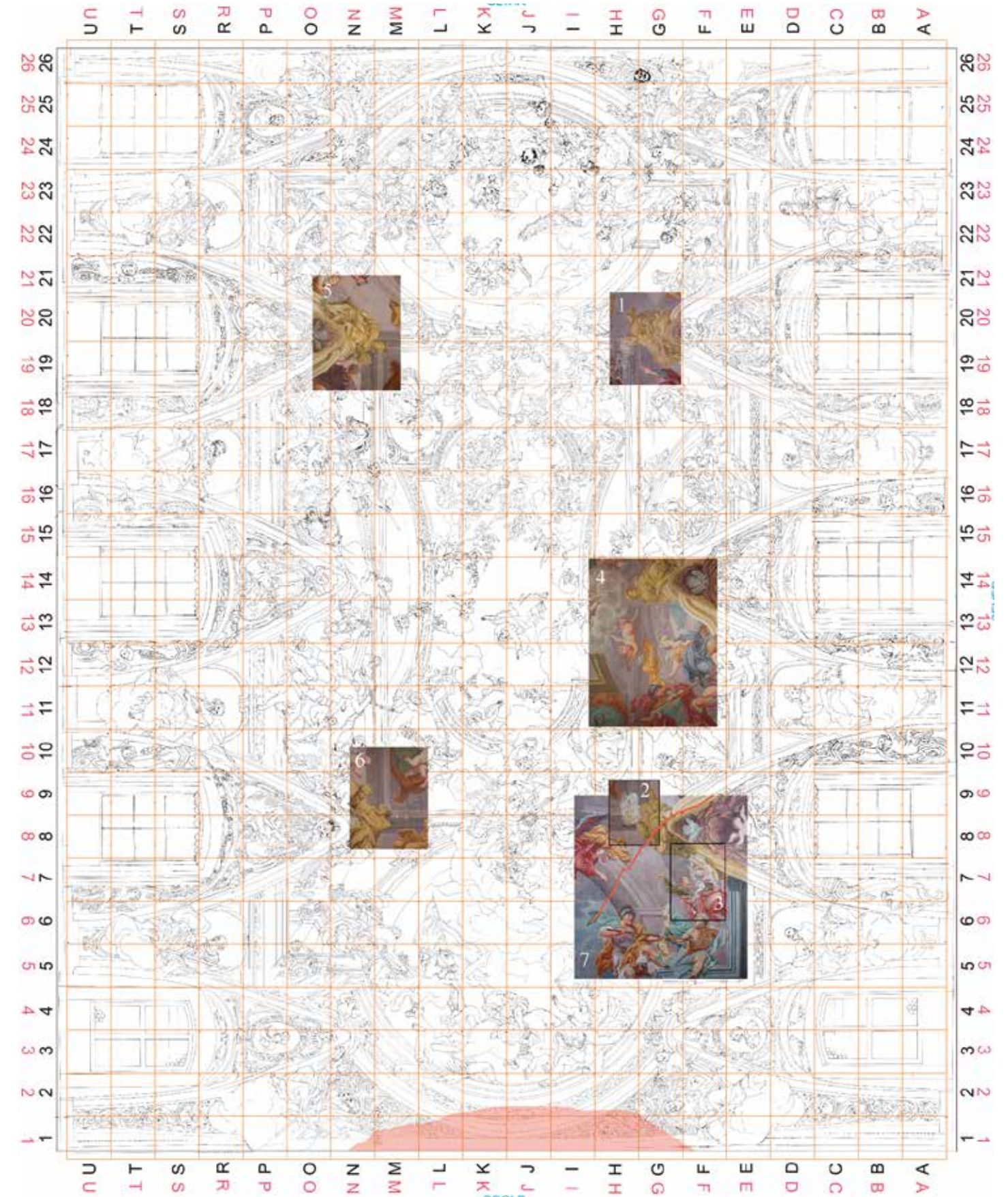


Figure 88: Locations of the most damaged areas of the vault painting.
 The coloured part denotes the fallen off area of Quaglio's original mural, most probably after the earthquake of 1895. Before treatment the plaster in this region was exchanged for a plaster of a coarser structure. The colours in this fragment are darker, probably due to the change in the binder used.



CRACKS

The damage that had occurred due to various degrees of expansion and stress on the materials, most probably also because of big and small earthquakes, was visible in the form of wide cracks from which plaster, black sooty impurities, pieces of brickwork and small stones fell down (figure 89). Such disintegration of the built surfaces is visible at all junctions between the northern and southern wall of the nave with the initial arch of the lunettes (figures 90, 91), which acts as proof that all walls were first constructed to their complete height, then workers embarked on the production of the roofing with roof cover, and then safely began construction work on the main vault and lunettes. The majority of most extensive and, in terms of complexity, worst damaged areas can be located in the region of the junction between the western and northern wall (figure 92). Obviously the worst damage to the walling and roofing occurred here already at the time of the famous earthquake in 1895, or just after, which was indicated by the numerous heavy cracks across the entire western wall (figure 93), as well as traces of leakage at the bottom part of the vault near the bell tower (figure 94). Heavy scaling and flaking of the colour layer as well as the deeper plaster layers (figure 95, left) was

Figure 89: The large crack in the region of the junction of the northern bell tower and the wall of the nave.

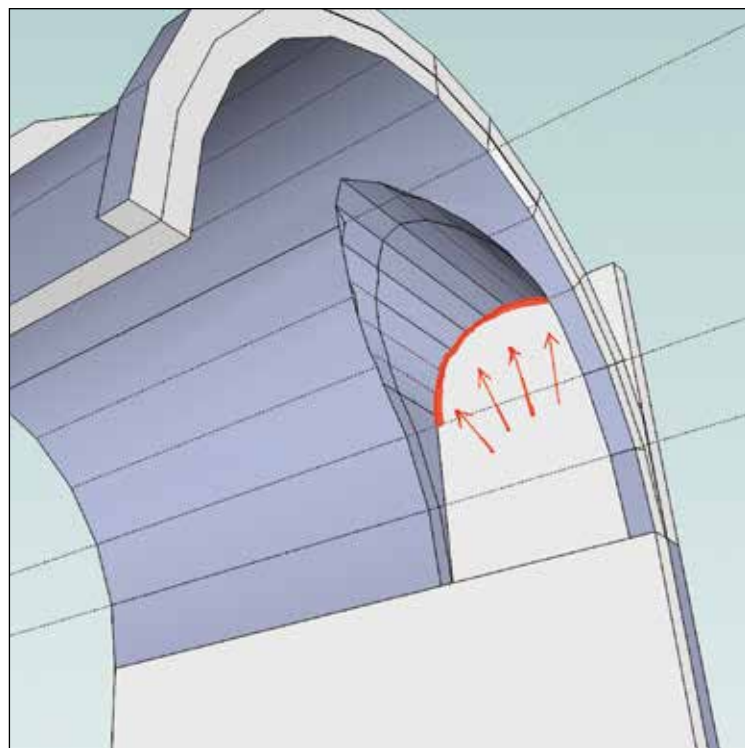


Figure 90

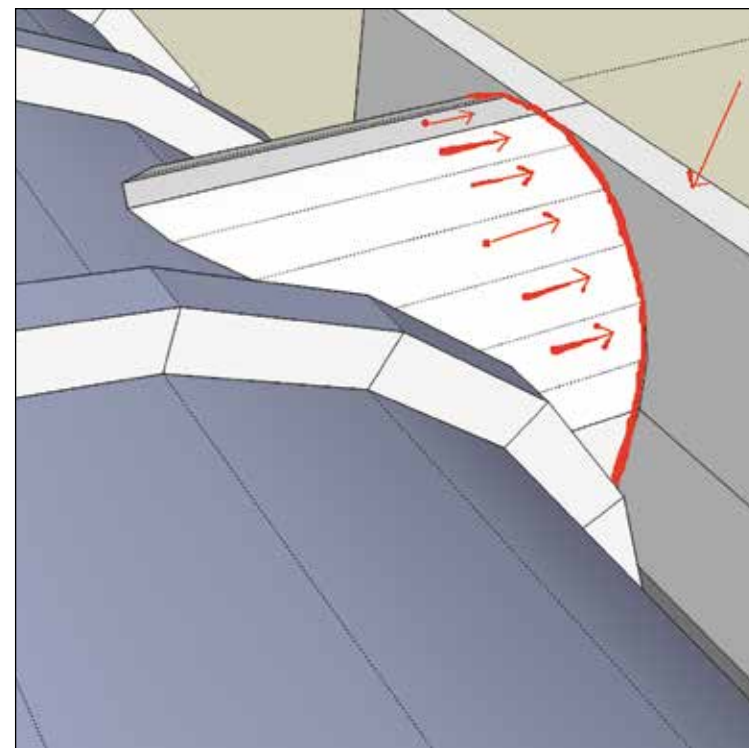


Figure 91



Figure 92: North-western corner – results of leakage.

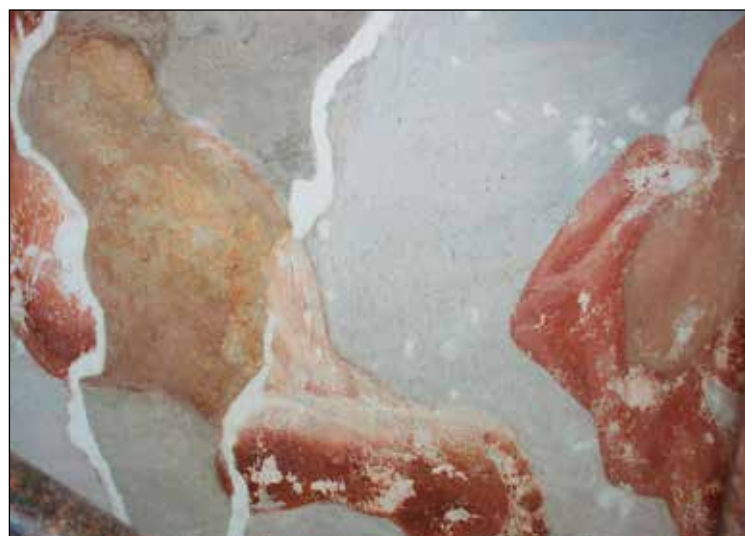


Figure 93: Western wall – condition before the renovation of the darkened reconstruction.



Figure 94: Junction of the northern and western wall – results of leakage.



Figure 95: Junction of the northern and western wall – before renovations and after.



Figure 96: Junction of the northern and western wall in the attic.

the result of more recent leakage at the junction between the bell tower and the roofing. Despite heavy damage, we were successful at restoring the region (figure 95, right). In the top region of the junction between the western wall and the nave vault we documented the area where the original plasterwork had been replaced by new plaster, which was coarser in structure and not well-matched in terms of colour. This was also the only area across the entire surface of the painted vault from which a part of the mural together with the plasterwork fell off during the earthquake (cf. figures 56, 57). Some damage was certain to have occurred in 1988 during masonry work on the reconstruction of the tympanum,²² when the walls were injected and water run down the already damaged paintings. In figure 96 the junction between the north and west wall in the attic can be noticed, with visible newer reconstructions and improvised support of worn out beams. In the thermographic record (figure 97), a red line is visible in the lunette which denotes the crack that seemed minimal at first glance. When the crack was expanded, quite a lot of fine material dropped down from the abutment above the vault. The piece of plaster that we removed during this was black from soot and other impurities on the inside, which proves that the crack had been open for a longer period of time. The plaster between the bricks in this region was so weakened that individual bricks had no intermediary bond, so to say (figure 89). The crack continued across the field above the window, reaching into the depth of the northern wall (figure 92).

When the earthquake struck, the walls swayed at different frequencies because of the raised height of both bell towers, which caused numerous heavy cracks on the western side.

The occasional unsuitable proofing between the bell tower and roofing can be a source of problems in numerous churches, particularly in storms and melting of snow in the winter. The water which thus enters through the roofing slowly leaks through all the layers in the vault, bringing substances into the construction and plasterwork that with time appear on the surfaces of the wall and ceiling paintings.

In 1945, several windows were damaged after the shock wave that came with the explosion at Ljubljana railway station. Perhaps it was then that the movement of the roof tiles or similar damage, and possible leakage of the roofing occurred.

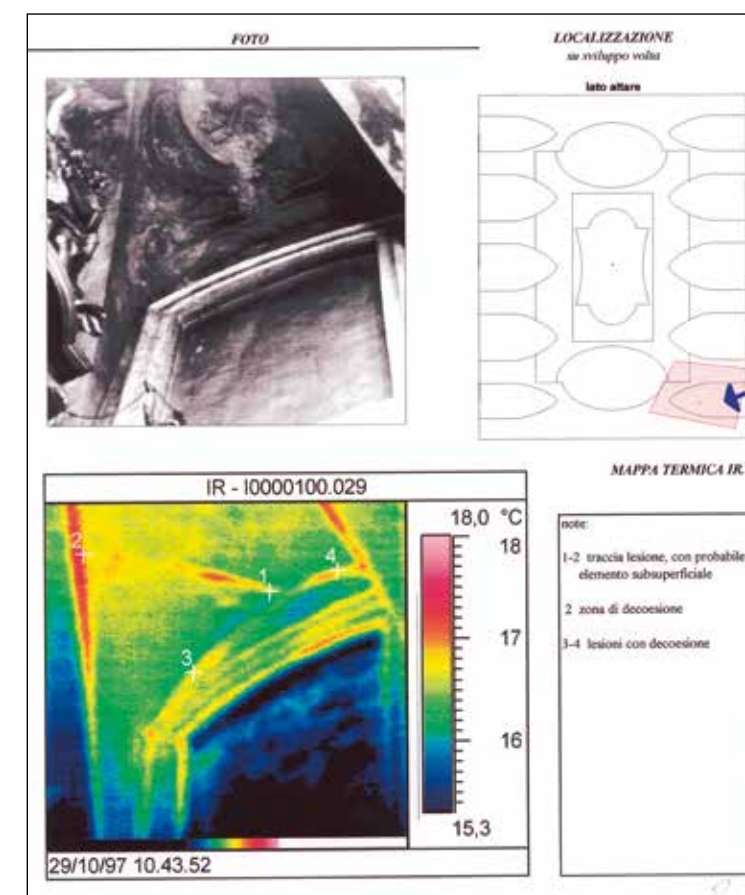


Figure 97: Thermographic record of the north-western lunette (SER.CO.TEC. 2006).

²² BENEDIK 1989, p. 357. The report mentions supervision of the execution of masonry works during the exchange of the triangular gable.



Figure 98



Figure 99



Figure 100



Figure 101



Figure 102

CHANGES AND DAMAGE TO THE COLOUR LAYERS

Giulio Quaglio painted the interior of the illusionistic dome in September 1703, from which only three fragments remain. Their positions are shown in the oil painting by Matevž Langus, who documented Quaglio's work and preserved some precious information on the composition of the time (figure 98). The wooden plastered construction of the illusionistic dome was in 1841 removed and replaced by a real, built dome. The preserved fragments show a darkened pigmentation in the regions of the nose, cheeks and lips. This occurrence was even more intense on some of the faces of the figures on the ceiling of the nave depicted during 1705 and 1706 (figures 99–102). After completing the modelling of the faces with oxide red, which appears fairly sedate, Quaglio applied bright red highlights in a cinnabar (vermillion) based colour which, however, blackened with time.²³ The bright red pigment was also used in depicting the flower wreaths (figures 103 and 104), which were inpainted in a tempera technique using an organic binder. The colour layer here lifts from the ground; a similar occurrence can be noted in the case of the green-coloured leaves (figure 105). In figure 106 we partially removed the top, darkened layer and discovered particles of an intense red pigment

²³ ROPRET, 4 June 2003. Steska writes about the visibly darkened cinnabar, although only on the lips, in as early as 1903. It is interesting to note just how precisely, and from quite a distance, he was able to determine the type of darkened pigment, since this was only confirmed in 2003 through scientific investigations, cf. SITAR 2004–2006 a, p. 9, fn. 31.



Figure 103



Figure 104

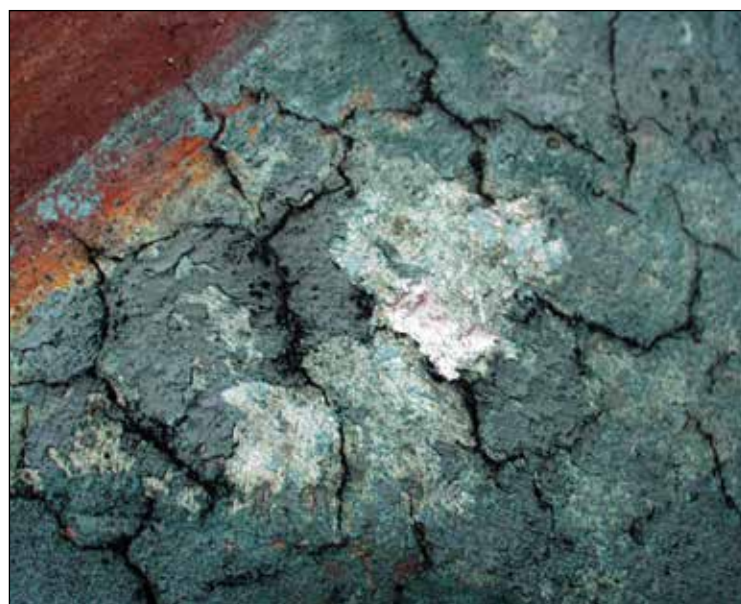


Figure 105

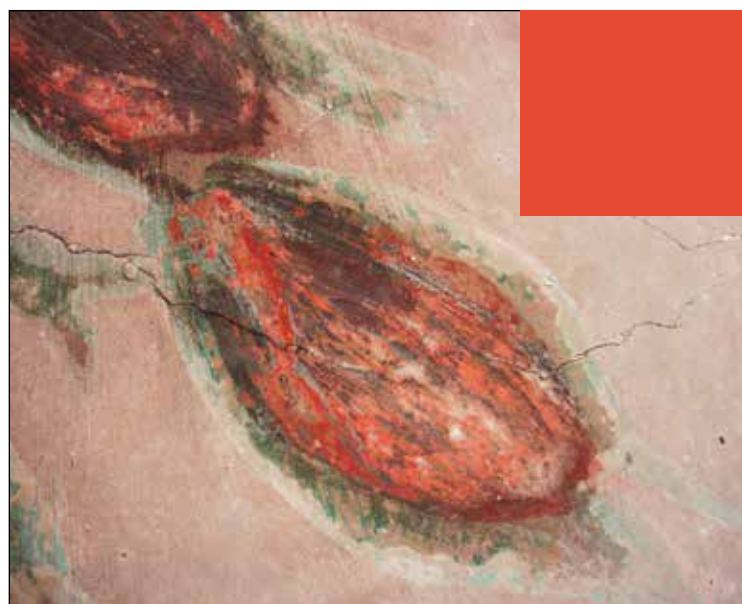


Figure 106

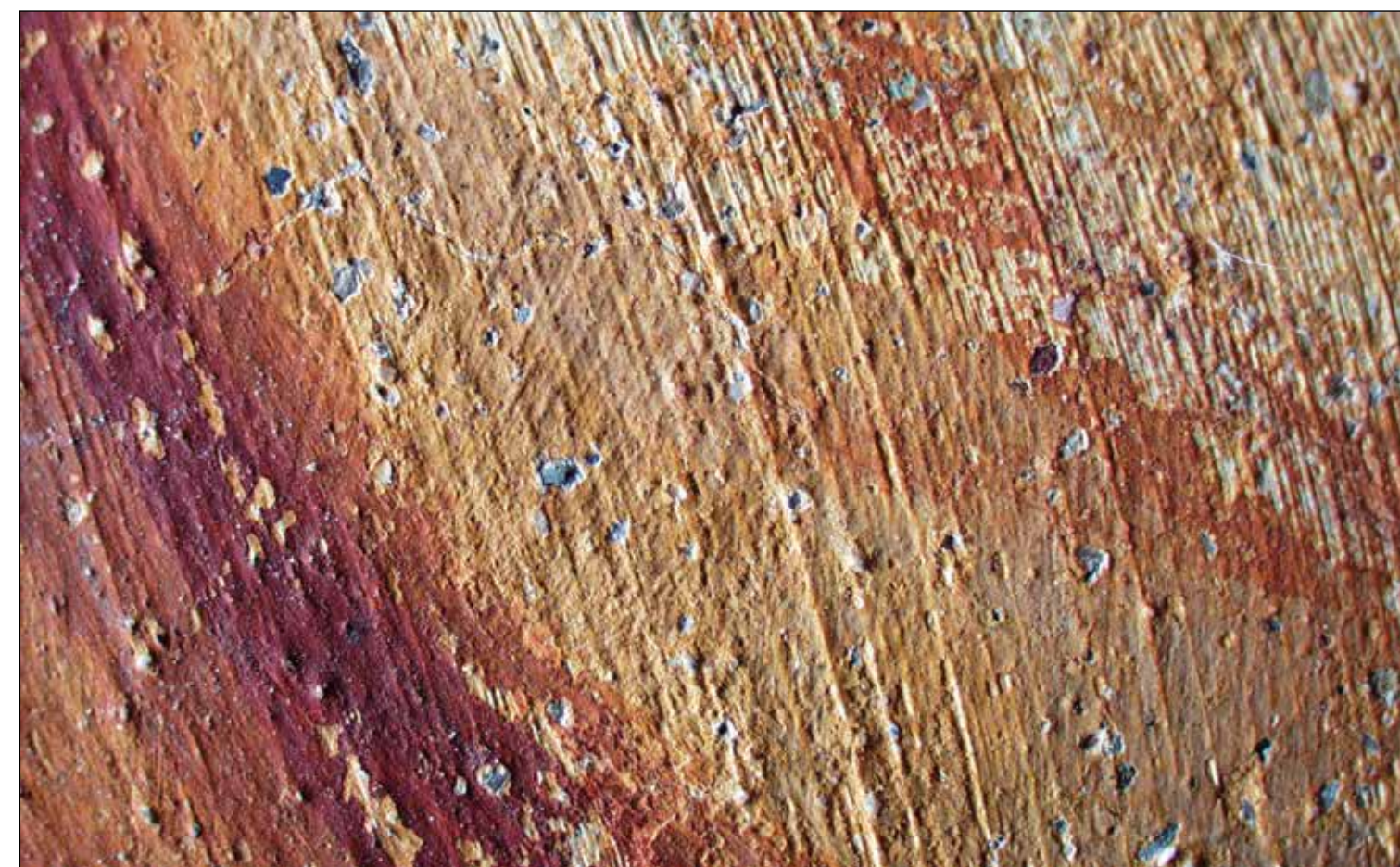


Figure 107

underneath. For better conception, the appearance of the vermillion is shown in the square according to the RGB value 255 77 0 (#FF4D00) or CMYK (0 83,92 100 0). Already Cennino Cennini²⁴ in the first half of 15th century dissuaded from using this pigment in the fresco technique. We decided against reverting the darkened pigments back into their original hues, even though investigations had already been performed in this area.²⁵

One of the typical and, in terms of quantity, most frequent types of damage that we came up against from the onset to the project's completion was the flaking of tiny particles of the colour layer with the whitewashes underneath across the entire surface of the wall and ceiling paint-

ings. In figure 107 it can be noted that in most cases small grey or dark stones can be seen in the damaged areas, which could have been the cause for the flaking, possibly due to a fairly significant expansion of volume under the influence of moisture.²⁶ Certainly a part of the flaking particles came as a result of mechanical cleaning, particularly on the surfaces where the wall and ceiling paintings did not join together so well. The ground used in this image is a thick lime whitewash (visible textured vertical traces of a wide paintbrush) – one of the techniques used in the painting of the vault. The whitewash had to be quite dry and solid when the thick layer of top ochre with brownish modelling was applied over it, since the wet or moist whitewash would have softened the here clearly visible texture of any later stroke of a brush to the painting.

²⁴ Cf. chapters XL and LXXII in: CENNINI 1933.

²⁵ KOLLER, LEITNER, PASCHINGER 1990, pp. 15–20.

²⁶ BOGOVČIČ 1990, pp. 5–7.



Figures 108, 109: With paper crosses marked points measured by laser – transferring the grid of quadrants with 100 cm sides onto the vault.

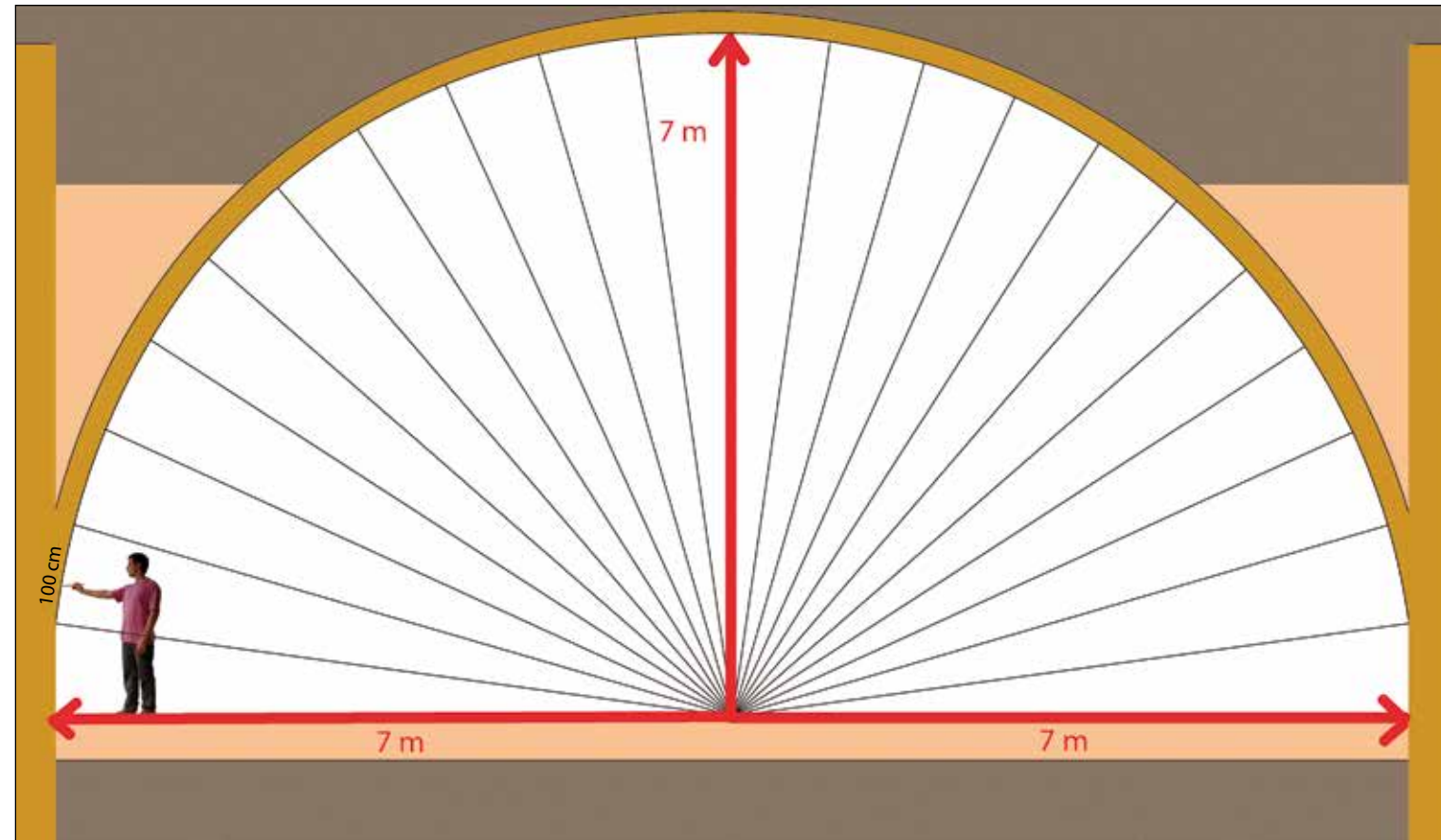


Figure 110: The warp of vault painting divided by quadrants with 100 cm by 100 cm sides is smaller.

DOCUMENTATION

How to demonstrate the curved surface of the vault on a flat plane without deformations? How to produce a precise drawing of the wall and ceiling paintings encompassing the whole of the vault in a suitable scale, precise enough for the use of this current project, and hopefully to a standard of quality for the future restoration treatment of generations to come? Already at the onset of the project we incessantly posed questions of such a nature. Precisely during the project (2002-2004), the use of

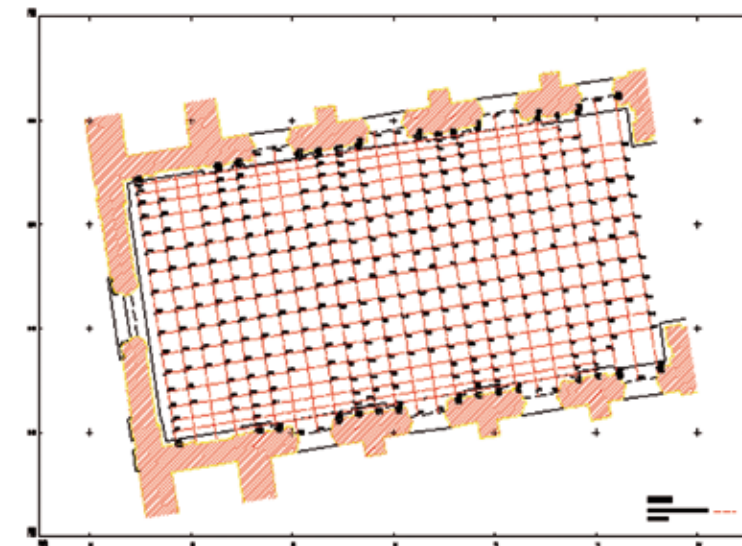


Figure 111: Photogrammetric draft.

digital photography became very widespread in Slovenia, also in the field of documenting restoration projects.²⁷ At first this was more in terms of quantity and as a quickly attainable supplement to existing professional photographic equipment, while later it increasingly became a constituent part of the restorer's equipment due to numerous useful details which are a constituent part of a digital image. Besides using digital and classical photographic equipment, the entire project was also screened using digital cameras. Video footage clearly presenting all the stages of the restoration procedure was successfully used as precise illustrations and supporting material during the project at committee meetings, press conferences, informing the wider public about ongoing restoration works, whereas the material will also prove useful in producing teaching aids for educating future restorers.

However, all these technical aids are of little help if the recorded material is not adequately manipulated and above all safely saved. Shots taken using different cameras, lenses, lit by lighting of different strengths, and besides that, taken from various heights and angles were not the best starting point for producing a precisely composed image of the painted vault as a whole. For ongoing documentation it was necessary to shoot the mural in parts, draw out the parts precisely, digitalise them and compose them again into an open-plan, undistorted line drawing.

The production of the drawing onto PVA foil, a hand procedure, which is usually more easily handled on vertical walls and on unproblematic, undamaged surfaces, was in the case of Quaglio's depicted vault

²⁷ We officially began to use a digital camera – Olympus 2500L – at the Restoration Centre in 2000, at a workshop about cold lining under the guidance of Vishwa Raj Mehra from Holland.



Figures 112, 113: Photographic and written documenting of the mural paintings condition.

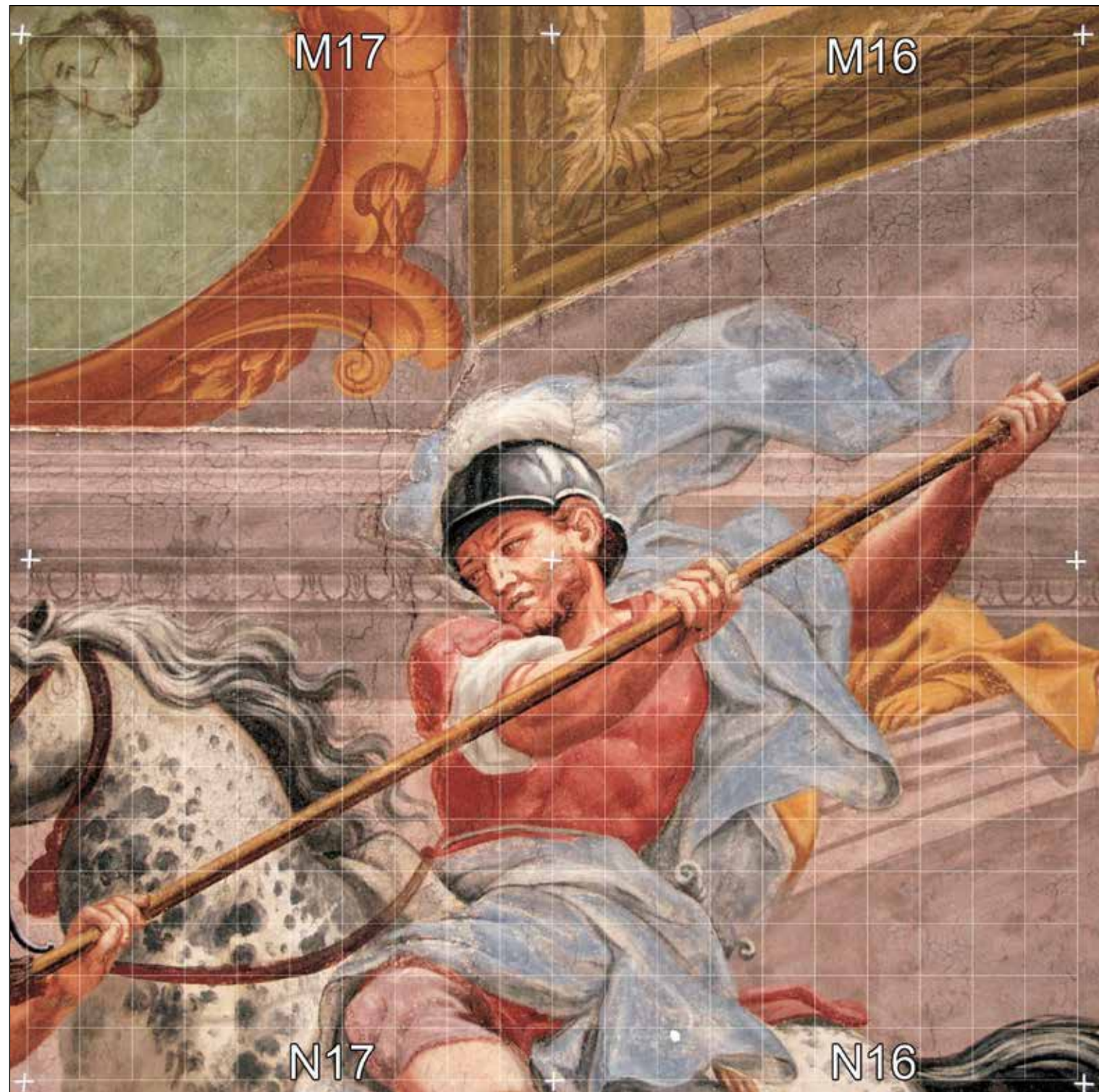


Figure 114: The grid of quadrants M17, M16, N17, N16.

in the cathedral not possible due to numerous reasons. Leaning the foil onto the uncleaned and damaged surfaces of the colour layer and plasterwork would have caused irrepressible new damage. Besides that, it would have been difficult to mark the points at which the individual pieces of foil overlapped on the vault without previously drawing the longer lines (grid), with the drawing of these lines being problematic of

course, particularly in areas of greater damage. The pieces of PVA foil that are only several metres large, would have to be kept still during tracing, which means that they would somehow have to be attached to the painted vault. Fixing the foil for tracing would have caused great additional damage to the wall and ceiling paintings and plasterwork. The number of pieces of foil would be extensive (600 or more) and all this



Figure 115: Condition before treatment, image of the vault painting with stuck on cross markings.

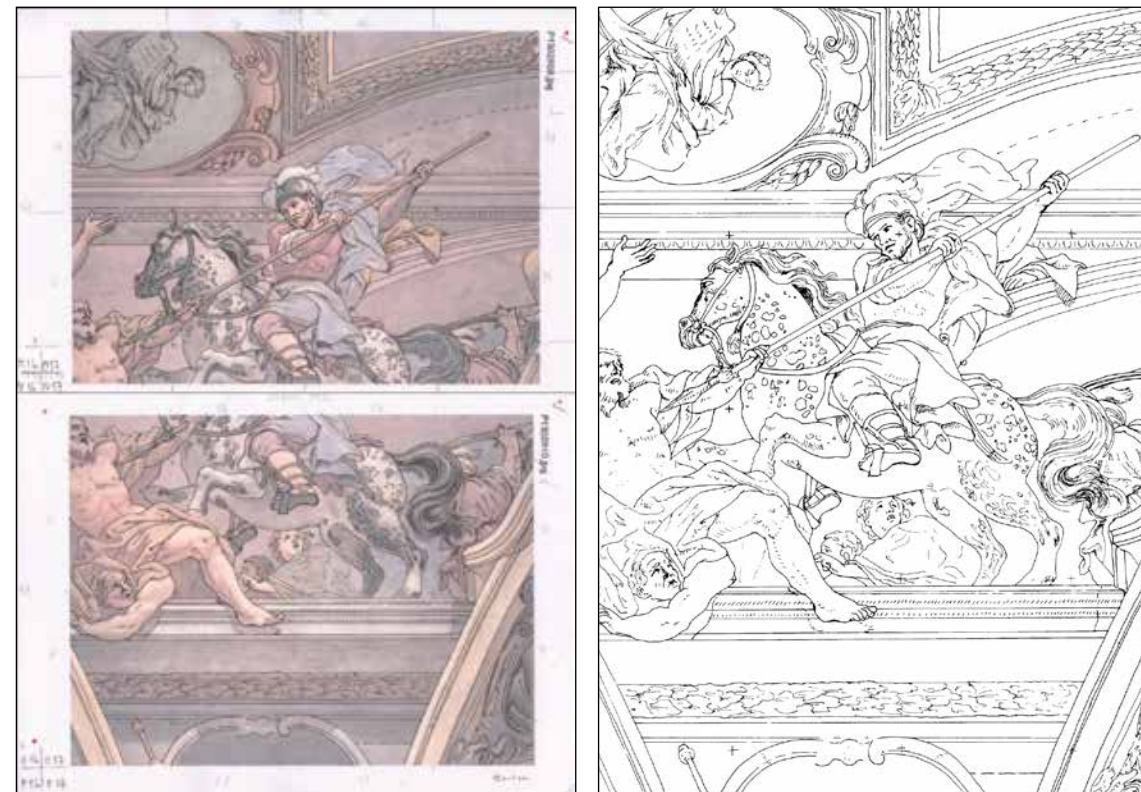


Figure 116: Drawings on tracing paper.

Figure 117: Combined drawing.

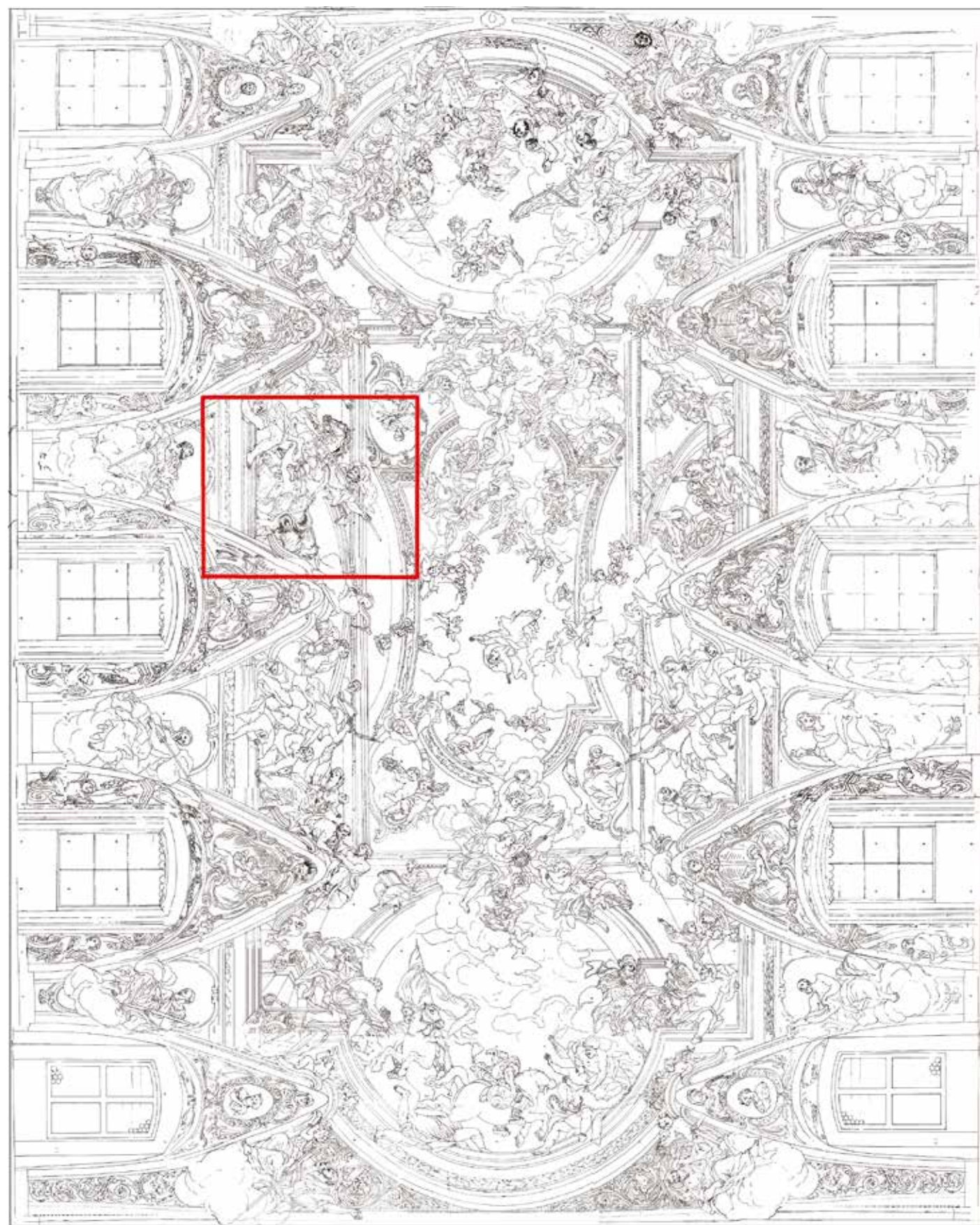


Figure 118: Drawing of a whole vault painting with marked position for drawing of figure 117.

would have taken up a lot of space. Each traced piece of foil would have to be photographed, distortions corrected and composed into a larger whole. Besides this, a problem would also have occurred in the uneven thickness of lines, which would have represented additional work on the computer. On the other hand, the transfer of the original drawing onto foil is of immense documentary value, since all points are transferred in a 1:1 scale, while it is at the same time an indisputable, palpable material evidence in comparison to sometimes fickle digital technology.

We were incredibly lucky with the platform set up: if positioned exactly in the middle of the platform, the distances were similar from this point to the northern and southern walls, as well as to the highest part of the vault: almost seven metres exactly! This meant that by turning and moving the camera on the tripod along the central longitudinal axis we always got nearly the same value of distortion along the whole of the vault, which made the manipulation of the photographic material and its transfer into line drawings much easier - under the condition of course that the camera was always aimed at the vault at a right angle. Our idea about marking and transferring the quadrants with 100 cm sides onto the vault using suitable measurement aids was precisely implemented by the experts at the Geodetic Institute of Slovenia (figure 108).²⁸ The marking of points measured by laser using narrow paper crosses (containing minimal amounts of adhesive) at a distance of 100 cm and sketches with a soft rubber band beforehand (figure 109), made it possible to later crossover and computer correct the photographic images and compose them into a whole. The warp of a 100 cm by 100 cm large plane in the middle is only 2 to 2.5 cm, which is actually fairly insignificant (figure 110).

By setting up a quality platform with a flat walking surface, with dust and noise proofing protection, access was for the first time in 300 years (previous restoration procedures did not have such technical possibilities to collect and publish documentation) made possible to a large number of visitors at a height of 13 m, from which they could observe restorers from a direct proximity, but more than that, Quaglio's work of art. The direct proximity to the work of art, which had up till then only been observed from a distance of 20 m, made it possible to produce images which will form a quality body of documentation on the procedure. Published here for the first time is also the drawing of the entire ceiling painting, which was produced in its first version as the result of the work of many restorers that worked with us at the beginning of the project. The first version of the drawing was - because of the different interpretations of details by numerous authors - exchanged for another, where most of the drawings were drafted again and were placed onto a quadrant grid more accurately.

A well produced system of grid points made the documentation material easier to handle, and more importantly, each point on the vault was measured and defined in the space relating to an already produced photogrammetric draft of the whole of the church construction (figure 111).

In the case of any eventual demolition of a part or whole of the vault, not only could the wall and ceiling paintings be reconstructed with such spatial measurements, but also the original curve of the vault.

Figure 108 shows the drafting of points at a distance of 100 cm from one another along the middle longitudinal line at the beginning of making the system of grid points. These central points were then projected onto the vault at 90° angles and marked with small crosses (figure 109). From these central crosses positioned at their highest points, 100 cm lengths were measured out at a 90° angle directed onto the central line. All measured out points were then marked by small paper crosses. Figure 110 also shows the measured out distances (7 m) from the middle of the platform. When photographing from the same point, only turning the camera at a right angle on its axis towards the quadrants of the vault, the distortions in the photographs produced were minimal. In order to gain a good shot of events on the platform, sometimes quite a lot of climbing ability was required (figure 112). All observations and findings were documented on the working platform as work went along (figure 113).

Using photographic footage (figures 114, 115), taken from the same distance with equipment that minimised distortion on the edges, individual scenes were drafted out by hand onto tracing paper (figure 116), including the small crosses which represented the extremely important information on the location of the mural as a whole, and the vault in the actual space. The drawings were digitised (scanned) and compiled into larger wholes (figure 117). Before compiling them into large wholes, any crosses that may have moved from the vertical and horizontal axes were corrected. All photographs were processed so that the distance between the crosses was exactly 7 cm. If we know that the crosses on the actual vault were arranged at a distance of 100 cm from one another, then it means that the drawings were produced to a scale of 1:4.3. All drawings were processed as mentioned and accurately attached to a grid with a raster of 7 cm using the crosses, so obtaining a spread of the entire vault (figure 118). Naturally the drawing includes some irregularities and distortions, in the region of the lunettes, which would have to be presented in a separate spread. However, the general opinion holds that these minimal irregularities do not detract from the presentation of the image as a whole, and the lunettes presented in such a way nicely complement the whole. Presented in this publication for the first time is a precise draft, which is undistorted at the edges (apostles and lunettes), of the wall and ceiling paintings on the vault. The photogrammetric drafts, which very pleasingly presented the position of the paintings in the space (cf. figures 46 and 55), were useless in the process of precisely marking positions due to great distortion on the edges.

The "map" of the wall and ceiling paintings published herein is certainly the most suitable for data entry and further study.

²⁸ Poročilo 2003.



Figure 119



Figure 120



Figure 121



Figure 122: Reconstructed wall painting of the blind window.

PROBING, REMOVAL OF WHITEWASHES – DISCOVERIES

Besides the newly discovered mural on the triumphal arch wall, also the wall paintings on the two otherwise walled-in windows in the western part of the nave, to the left and right above the altar, are considered to be discoveries of restoration work belonging to this period. During removal of more recent, darkened whitewashes around the window openings (figure 119), the original painting was discovered under the whitewashes of the two mentioned windows (figure 121). Figure 122 shows the reconstructed mural on the blind window. By probing underneath all original windows, the original height of the windows was also discovered, which ties in with the lower edge of the newly found mural (figures 119, 122). Since the roof above the tribunes on the outside was raised during a certain period, the windows, or window openings, had to follow likewise. The beautifully adorned stained-glass windows (figure 120) were changed with new ones during treatment at that time, since the old frames had become rusty and many glass parts were cracked or broken. Because of the missing glass parts, a draught was coming in through the openings causing air to circulate in the church and hence increasing the raising and settling of dust on the painted and non-painted surfaces. Besides that, the openings provided big and small animals with free access to the interior of the church. Precise measurements were taken from the oldest preserved window above the northern sacristy of the church and new windows were produced accordingly. Additional flat glass panes were installed on the outside to provide improved warmth insulation and mechanical protection.

GIORNATE

Finding and documenting more or less visible junctions between differently sized surfaces of painted plaster, called giornate, belongs among the standard procedures in conducting investigations on the construction of wall paintings. The term giornata, or “a day’s work” in wall painting means the area of wet plaster, also called the skim coat (intonaco), onto which the painter applies pigments moistened and diluted only by water, with the process only taking as long as the intonaco remains wet. Work must stop when a crust of calcium carbonate begins to form on the surface, since the bound pigments from the surface would otherwise be washed or wiped off later. Any spare or unpainted intonaco, or that which has been painted too late, was usually cut off at a blunt edge before the application of a new giornata, so that the new plaster smoothed out with the old plaster more evenly. In the case of edges cut at right angles, a groove can occur due to the shrinkage of both plasters, which can cause water to enter or micro organisms to move in, aiding disintegration of the plaster. The progression and range of the giornate in Quaglio’s wall and ceiling paintings on the vault could not be clearly defined in all areas – in some places they were so skilfully smoothed out that they could not even be identified by sideways lighting, even though we could foresee by the size of the painted surfaces where they should proceed. It was par-

ticularly difficult to find the seams between the giornate in places where the plaster had been so moist the day before that it was smoothed into an unnoticeable transition with the new plaster (figure 123).

Damage relating to the giornate can most often be seen in the form of the darker overpaints or inpaints, or lighter edges (figure 124) on or at the edges of the giornate. These, obviously later added layers (darkened areas) occurred with previous restoration treatment in places where attempts had been made to sort out the surfaces by using retouching and reconstruction, from which the colour layer had flaked off, or where the edge of the previous (older) giornata was damaged by the gliding or smoothing of the new plaster against the old one. The thin, smoothed layer of the newly applied plaster dried at a quicker rate on the edges and did not sufficiently carbonise in these areas thus becoming dusty. Besides this, the imprecisely applied areas could not be removed completely despite immediate washing since it is commonly known that whitish traces always remain after such removal. Usually these unsuitable transitions were corrected by the artist himself, although always using the tempera technique, since he knew that the calcium carbonate crust had already formed, therefore painting onto a partially already carbonised ground with just pigments and water would cause patchy, unevenly painted surfaces because of the different absorbency of the ground. Precisely this drying of the plaster at different rates on the junctions of the giornate as well as the corrections were causing the colour layer to flake and dust off due to the poorly adhering, uncarbonised colour layer, while this damage was becoming increasingly noticeable with the centuries. Since the binders used for retouching these areas during previous restoration treatments were substances (casein, animal adhesive, even oil) that darken in the air and in contact with a wet lime ground, with time the retouched areas became more and more visible and disturbing to the eye. At the beginning, looking from afar, these overpaints seemed like Quaglio’s purposefully emphasised strokes, however, upon more exact examination this was proven otherwise.

In figure 126 a typical seam between two giornate (A – older, B – newer) can be seen, and an unsuitable darkened retouch on the junction of both. The yellow line marks the edge of both plasters. The area marked by a reddish colour shows where, due to the plaster drying at different rates because of different thicknesses of application, different levels of carbonisation usually occur on the surface, resulting in the flaking of colour particles from the plaster that had dried too quickly.

Besides the progression of the giornate (red) and darker overpaints, figure 127 also shows the slight flaking of the colour layer (yellow). A portrayal of a simple movement of the cracks: the crack is bridged over by plaster, since the tiniest movement causes visible cracks on the plaster layer (blue arrow).

The giornate almost always signify that the wall and ceiling paintings have been executed in the buon fresco technique, whereas any hypothesis can finally be confirmed or rejected by the results obtained through scientific and other investigations.²⁹

²⁹ Cf. KRAMAR 2007.

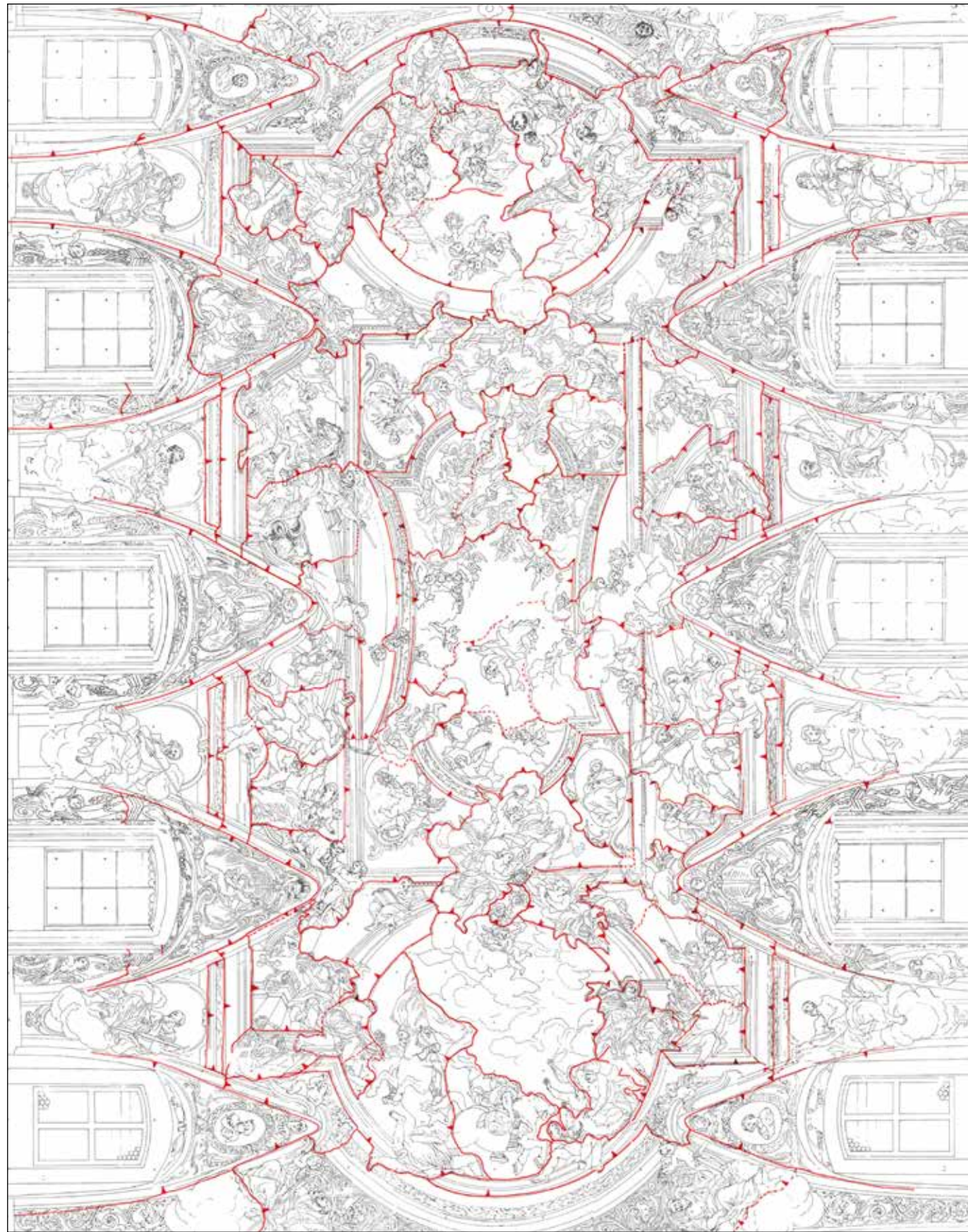


Figure 123: Marked giornate found on the vault.



Figure 124: The light edges of the giornate and the darkened retouch between the feet.



Figure 125: UV-image before treatment – visible corrections in the region of the giornate.

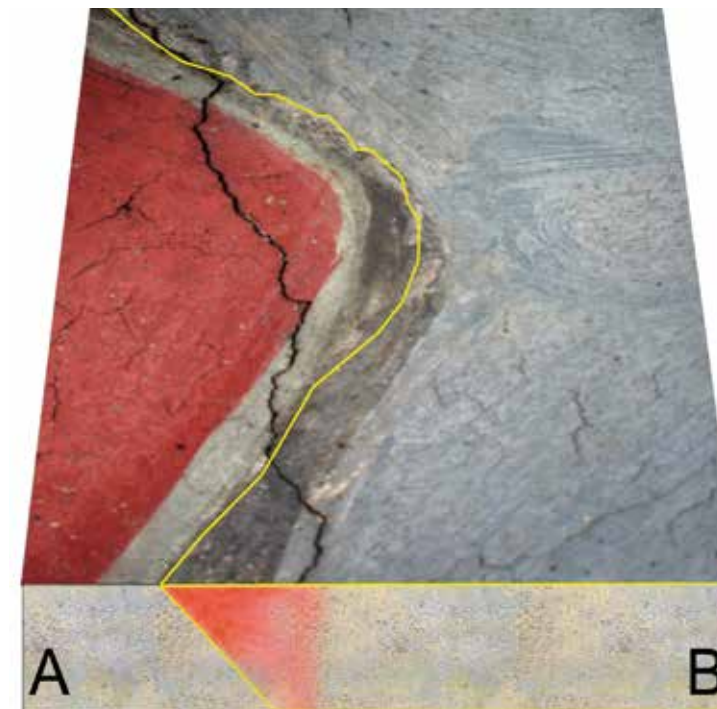


Figure 126: Damage at the junctions of the giornate can occur when the fresh plaster of a new giornata is being added and attempts are being made to create as seamless a junction between the new and old plaster as possible. If the smoothing and levelling of the plaster is not handled carefully, the initially very fragile top layer of calcium carbonate on the old plaster can be crumbled away.

The drawing spread of the wall and ceiling paintings on the vault with the giornate drawn in red is a standard portrayal of the structure of the surface made up of smaller surfaces that were usually painted onto fresh plaster in a day. The average size of one giornata ranges from 2 to 3 m². On the surfaces, which are considerably larger than most of the others, no signs of edges were discovered between two neighbouring layers of plaster, which could mean that they were so skilfully smoothed over that they are impossible to find, or else that they were never there in the first place. Some surfaces, less demanding in terms of painting (sky, clouds, architectural parts), could be painted more quickly, making the giornate with such and similar elements larger than others. The larger, but in terms of painting very demanding giornate (many figures, draperies)



Figure 127: The bridging of gaps with plaster – a simple method for observing the activity of cracks which, however, is merely informative – if the plaster splits in the direction of the crack then we know that the movement arose, but we do not know when it took place or whether the crack is still active.



Figure 128: A darkened retouch on the junction of two giornate.

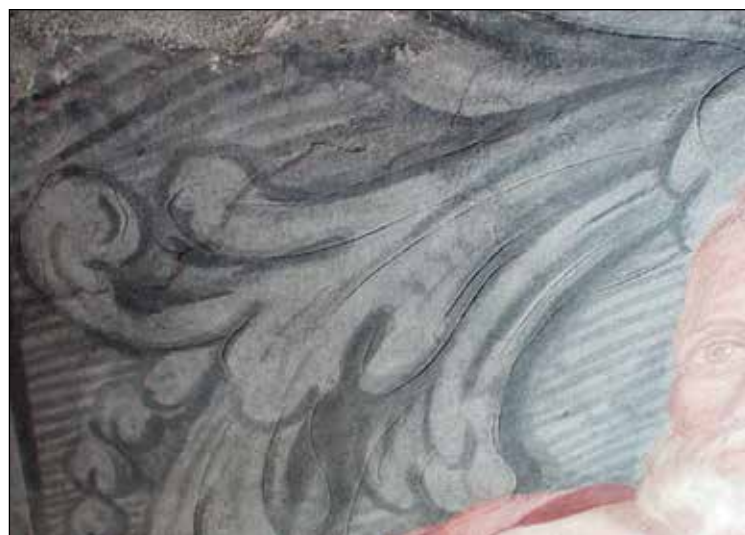


Figure 129: A cartoon was used for vegetation decoration.

were essentially painted in the al fresco technique, with finishing touches done in lime and casein tempera. The consistency of the junctions is at first glance quite symmetrical and balanced; however, looking with more precision the scales are tipped to the east towards the altar because of the numerous smaller giornate that follow the richly structured figural composition all the way to the middle of the vault. It is highly likely that Quaglio began painting the vault in this part, closer to the transept and presbytery, where he had been painting during the previous two years (1703 and 1704).

QUAGLIO'S PAINTING TECHNIQUE

When we talk of the giornate, we need to look into all the other leads that Quaglio or his assistants have left for us voluntarily or involuntarily within this restricted form. Discovering the junctions between the giornate does not in itself mean that the area was really painted onto fresh plaster, since the plaster on these surfaces could have dried out prematurely due to various reasons with the carbonisation of the crust discontinuing formation. Therefore further details are sought in the form of incisions, imprints typical for the transfer of a drawing from a cartoon, traces of transfer of a drawing from a perforated cartoon, as well as possible preparatory drawings. The transfer of a drawing onto moist but not too soft plaster using a cartoon can usually be seen well by the typical softly rounded and smoothly running dents, which have not been followed exactly by the painter's brush, but rather develop and adapt the basic form to the wider whole. A cartoon with a carefully drawn enlarged image following a smaller sketch was used by Quaglio in the areas where repetitive, yet quite variable symmetrical and mirror forms occur, usually on opposite walls, such as vegetation (figure 129) and all leaf wreaths that emphasise the joins between the surfaces and the frames. Prior production of cartoons enables the painter a quicker and more precise transfer of the image, therefore giving him more time for painting. Totally different marks were left by the incisions and imprints in figure 132. This image shows short, overlapping lines that obviously marked a point, which had been measured out with some significance. The sharply defined and very vigorously sketched traces (probably a sharpened wooden stick) executed into still wet plaster containing a lot of lime follow this sign, designating the width and progression of the red-brown coloured passage.

Dolničar's record that Quaglio's assistant Carlone "*immediately transferred in red that which the master had drawn with the brush onto the cartoon so skilfully that all who watched thought it admirable*"³⁰ poses several questions or possible answers in connection with the presented close-up shots of the red preparatory drawing. The first option is to understand the sentence exactly as it was written. Here we must immediately ask whether Dolničar perceived a difference between "*drawing with a brush*", or would it have been more aptly said "*depicting with a brush*". It is highly likely that we are talking about Quaglio's work-in-progress wash drawings, probably coloured, which Carlone magnified into an appropriate scale by using a grid. It is not clear why it is here explicitly mentioned that he drew onto the cartoon with a red colour, since he could have used any darker colour which would have been better visible. It is also not clear why the hurry is emphasised, "*that which the master had drawn was immediately transferred in red*", since the cartoons had to be prepared beforehand and not drawn on the scaffold as work went along. Even if Carlone did magnify Quaglio's smaller sketches or drafts into a

³⁰ DOLNIČAR 2003, p. 293.



Figures 130, 131: When observing with the naked eye the preparatory drawing functions as a graphite drawing that has left a red trace, whereas the enlargement, particularly in figure 132, establishes that those are in fact brush strokes.



Figure 132: Incisions and imprints.

larger scale, this was part of a routine procedure, which did probably not warrant any attention from viewers, since it did not demand any exceptional skill given the grid and as small mistakes had no essential influence on the proportionally correct outcome. It would be more credible that viewers would admire someone capable of drafting an enlarged drawing with aplomb and speed onto fresh plaster or whitewash, without laying down a cartoon onto the plaster, thus procuring Quaglio with a suitable orientation drawing for starting painting in as short a space of time as possible.

Figure 130 and its enlargement (figure 131) are particularly significant for understanding the technique used in painting the vault. The images clearly show the relief traces done with a wide brush applied with thick lime whitewash. The trace on the left side of figure 130 comes from the first coating, followed by the top coating, with the third diagonally covering both. Each new brush stroke completely redirects the old grooves of lime towards its own direction, which proves that these whitewashes were applied to the plaster simultaneously, so to say. The still wet covering traces of the wide brush are horizontally interrupted by the red coloured undulating stroke of a thinner brush – proof that can mean two things.

1. That Quaglio (or more probably his assistant Carloni or someone else), soon after the masonry master had applied a thin layer of intonaco in the designated scope (but then again not too quickly since the wet whitewash would soften the intonaco causing it to spread out), coated this area with a thick lime whitewash as soon as possible and immediately began to draft a red preparatory drawing with a fine brush (figures 131, 133), naturally keeping to the already prepared model. Within the boundaries of this preparatory drawing, Quaglio then painted the surfaces with thicker lime tones, on his own or with his assistants, continuing with darker tones in a more watery technique. If the intonaco and the whitewashes did not dry out too quickly (summer months), he was able to paint the larger surfaces at a faster rate, whereas the moist layer of intonaco together with the lime whitewash and pigments was also able to carbonise quite well. Unfortunately no traces of sinopia (or preparatory drawings we could also say) were found across the entire surface of the vault mural; that is drawings on the brown coat (arriccio) layers, which usually denoted the rough division of the composition as a whole into pre-planned giornate. Perhaps the charcoal mark similar to a cross (figure 134), which was discovered on the damage in location H19 with the removal of damaged plaster up to the brick support – can be taken as proof that charcoal was used for drawing in the initial composition of the mural. Using charcoal to draw on plaster is often mentioned in literature.³¹ On the surfaces, onto which it can be vouched with certainty that the drawings of the cartoons were transferred, no traces of the cartoons having been fixed with nails or similar material were found. Individual finds of holes (figure 135) are not sufficient evidence on the use



Figure 133



Figure 134



Figure 135

³¹ MERRIFIELD 1846; also CENNINI 1933, chapter LXVII, in which he describes the use of charcoal drawing on arriccio when drafting the composition; before the application of the intonaco, the charcoal is dusted with feathers.

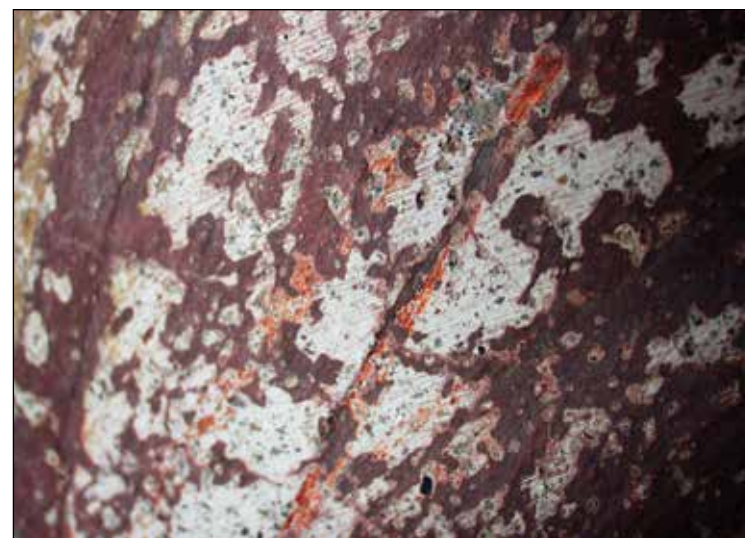


Figure 136



Figure 137: Highlights applied with original lime whitewash.

of nails for temporary attachment of a cartoon in transferring the drawing onto plaster, since numerous nails were removed from the vault before superficial cleaning of the vault, which had more recently served for fixing various ropes and wires when decorating the interior. The two vertical lines in figure 135 are not grooves impressed through a cartoon in the process of drawing, but traces of the brush with the red preparatory drawing in a thick lime whitewash, later painted over by a layer of ochre. Since the ornamental lime coating was not applied to a fresh layer underneath it did not adhere properly to the ground and began to flake off due to its fragility.

2. The thick lime whitewash was applied onto dry plaster, onto plaster that had dried out so much already that it could not carbonise, preventing the whitewash from binding properly with the intonaco. In such a case the applied pigments are bound only in a thin area of the whitewash which, however, dries much faster than the layer of intonaco, therefore only a weak layer of plaster carbonate is thus created here in such a short period of time. We can only guess at why Quaglio decided to paint some portions onto wet lime whitewash with an already dry ground. One of the reasons could be tied to the summer season and location under the vault. The great heat under the vault, with which we had to contend ourselves during restoration work, certainly caused difficulties for Quaglio as well. We know that warm air rises and lingers just underneath the vault, whereas from the top side the air is additionally warmed by the heavily heated still air of the attic. How they battled with the quick drying of plaster during the hot summer months in those times can only be guessed at, since in our experience all our efforts to air and cool the space by opening windows were unsuccessful given that the air outside was even warmer than that inside.

Before applying a thick layer of whitewash onto a dry intonaco the surface was usually abundantly moistened in order to prevent the whitewash from drying out too quickly due to a lack of moisture. The already carbonised top layer of intonaco and whitewash was scraped off before application in order to ensure a better grasp. Such a whitewash did naturally not carbonise as well as the top layer of a wet intonaco, therefore a painting in such a technique can never be as permanent, it is more fragile and sensitive to mechanical cleaning and prone to flaking off from its support (figure 136).

By using the technique in point 1 with the application of whitewash, the intonaco layer is additionally moistened prolonging the time avail-

able for painting, while the surface is also fortified with slaked lime. In contrast with the technique in point 2, where the whitewash layer is applied onto an already carbonised surface and the top layer does not attach so well to the ground, in the first case the layer of whitewash together with the wall painting (with wet pigments) slowly combines into a uniform layer of calcium carbonate together with the top layer of the intonaco.

If we get back to figure 136, we can note that the particles in the painting from the red preparatory drawing are not flaking off because they were applied onto a thick, wet whitewash, with which they carbonised. On the other hand, the thick colour coatings applied later are peeling off unevenly, since they were unable to bind to the layer beneath to the same extent in all areas due to uneven carbonisation.

In some places the relief of the application of whitewash is more noticeable, in some places less. In the intensely modelled and thickly applied layers, traces of the whitewash underneath cannot be discerned. The highlights applied in a very thick, pasty whitewash are frequently cracked due to the thickness of application and quick drying (figure 137).

An example of painting onto wet intonaco with a coating of thick whitewash can be seen in figure 138. The top layer is not flaking or peeling off because of the quality of the binding of the lime through all the layers. The painter caught just the right moment when the whitewash had hardened enough in order to be able to paint in an almost watercolour manner – had he begun too early, the tops of the grooves of the lime whitewash underneath would have smudged and the reddish brushstrokes would not have been as sharp and intense, but rather dull and dirty since they would have mixed in with the whitewash, which was too wet. The fingers have been painted onto fresh plaster or whitewash in a watercolour manner with a red pigment. Even the individual strands of the brush can be noted; under the red there is a light purple sketch of the position of the fingers, which also functions as a shadow. The later added offside shadow was no longer added in a watercolour manner, but in an impasto using a thicker ochre coloured whitewash. Because of the weaker binding with the ground, the flaking of particles of this layer is more visible here.



Figure 138



Figure 139: Similarly to figure 137, the lightest areas have been painted with a lime-based white paint (bianco sangiovanni), which used to be prepared by prolonged drying of small loaves of slaked lime in a strong sun. The white powder obtained was used as a white pigment.



Figure 140: A detail of a patch on the horse in the area of quadrants O16, 17, 18 and N16, 17, 18 represents an example of quick painting with a dark pigment – the impression of Quaglio's brush is clearly visible.



Figure 141: Rare auxiliary lines, cut directly into the fresh plaster, without cartoons, were noticed when mapping out the architecture, which served as orientation points onto which the red preparatory drawing leaned.



Figure 142: Detail of the horseman's stick, a rare example of an imprinted line into fresh plaster – modelled by dragging a flat brush along a ruler.



Figure 143: A detail of the drapery from which the process of painting can be seen. The sketchy red preparatory drawing with some short lines indicates the measuring of points, within which directly, without a cartoon, the entire drawing is built up, firstly shaded with glaze, then thickly applied dark areas are added, and finally the thickly applied highlights are put in place. Until now only the lighter layers have been preserved, which contain more lime for binding pigments, and of course the red brush drawing applied directly onto a thick lime whitewash.



Figure 144: The strokes indicate a search for the correct position by the way that the position of the lines changes, which points to an obvious transfer of a smaller drawing into a larger scale, without the aid of a previously drafted quadrant grid.



Figure 145: A detail of the painted nail – the contraction of the binder has torn off the layers beneath.



Figure 146: Despite the impasto application of paint, the lifting of the top layer is still visible.



Figure 147: Red line – buon fresco, thick application of paint – fragile lime whitewash.



Figure 148: Modelling into a wet lime ground – good binding of pigments.



Figure 149: Quaglio's typical and recognisable strokes in shading the incarnate.



Figure 150: Quaglio's method of heavy shading using zigzag lines.

Presented are some details of the painted surfaces on the nave vault of St Nicholas in Ljubljana. Even though all three have the same ground, the brick vault covered by a lime whitewash, the state of preservation of the colour layers and underneath layers is not the same everywhere due to varying surface preparation and treatment, different temperatures of the space, hence different drying rates and subsequent inpainting using the tempera technique. It is most likely that the red preparatory drawing is the work of Carloni's brush, whereas the thick lime whitewash was applied by assistants. In such a way Quaglio was able to dedicate himself fully to painting. Before the application of lime whitewash, the moist intonaco had to dry enough to prevent the wet whitewash from soaking it – the duration usually mentioned is half an hour.³²

On the basis of numerous observations during work on the vault, study of many photographs, and by taking into account the results of analyses of colour layers and plasterwork, a possible process of how Quaglio's wall and ceiling were produced can be reconstructed. In order to understand the causes of damage and its forms, some basic understanding of processes of the formation of a buon fresco are required, as well as the formation of calcium carbonate as a pigment binder, and the offshoot of the buon fresco obtained by adding a lime binder to pigments during painting.

All three images (151–153) show only the two top layers of plaster; the coarser arriccio and finer intonaco. The first shows the theoretical construction of a buon fresco, while the other two illustrate the modification that was used by Quaglio on the cathedral vault mural.

Figure 151 shows the composition of a buon fresco,³³ where the two last layers, first the coarse arriccio (brown coat) and then the fine intonaco or skim coat, which is richer in lime, are applied onto the binding and levelling lime plaster layers underneath. After application onto the pre-planned surface area of the giornata and smoothing of the intonaco with a wooden panel, the painter embarked on painting the moist plaster using paints that he had prepared by mixing pigments and pure water. He had to stop work as soon as the intonaco no longer absorbed the water from the brush. That was the point at which the crust of transparent calcium carbonate began to form on the surface of the wall and ceiling paintings due to the known chemical process (figure 17, p. 146), which bound the applied pigments and the plaster layer beneath into a solid bond with water alone. The formation of the transparent calcium carbonate layer is coloured in red. No additional binders for attaching pigments were required, care only had to be taken that the transfer of the slaked lime and water from the depth did not stop prematurely.

Quaglio used and took advantage of the formation of the carbonised top layer by using classical lime plasterwork, however, he did not start by painting directly onto the levelled intonaco (skim coat) using just moistened pigments diluted with pure water, but modified the starting stage of painting with a thick application of slaked lime (figure 152). The application of the whitewash layer essentially altered the appearance of the entire starting ground, which was totally white and independent of

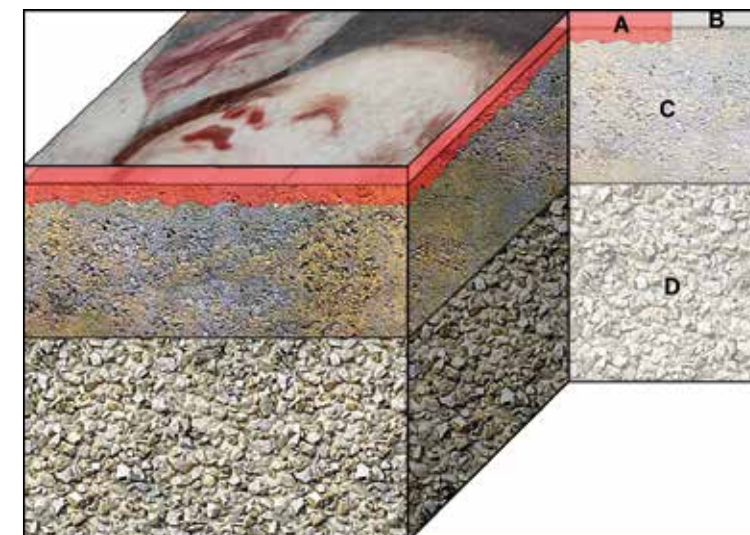


Figure 151: A: calcium carbonate CaCO_3 ; B: colour layer; C: intonaco; D: arriccio.

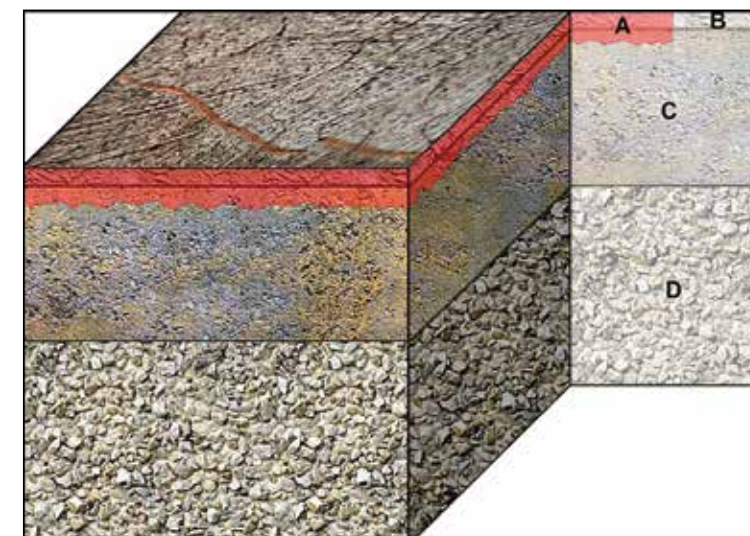


Figure 152: A: calcium carbonate CaCO_3 ; B: lime whitewash; C: intonaco; D: arriccio.

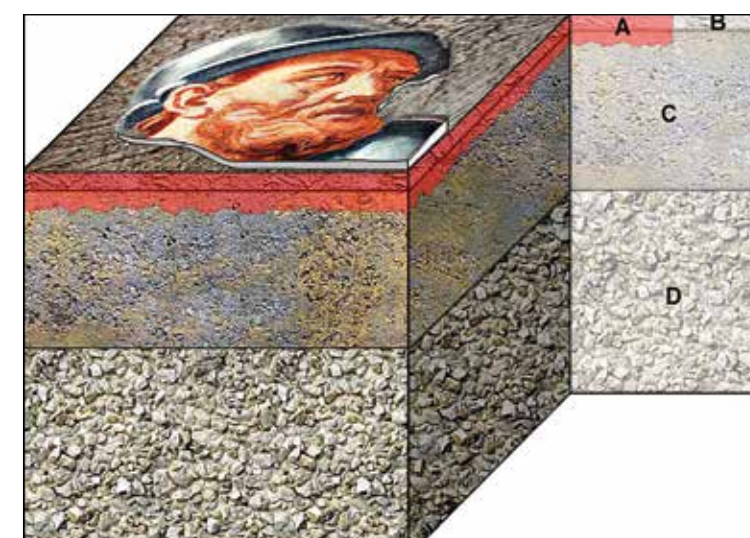


Figure 153: A: calcium carbonate CaCO_3 ; B: lime whitewash; C: intonaco; D: arriccio.

³² MORA P, MORA L., PHILIPPOT 1984, p. 151.

³³ Cf. also: Ivan Bogovčič, *Ilustracija z razlago: Stratigrafija prave freske – klasična oziroma idealna zasnova*: http://www.ff.uni-lj.si/oddelki/umzgod/umetnostne_tehnike/slkarstvo_stena.htm; MORA P, MORA L., PHILIPPOT 1984, p. 12.

the nuances that occurred in the intonaco due to slight variations in the proportions when the mortar was being mixed. In the case of a proper fresco, similarly to watercolour, lime is not added to build up the highlighted portions; rather the pre-planned light areas are left uncovered and the whiteness of the plaster itself is used for the light areas in the composition. Within this watercolour structure, masters of the buon fresco only used slaked lime as a white pigment, which had been drying out in the sun for a long time (*bianco sangiovanni*). The calcium carbonate thus changed into dust and then bound itself on the surface of the mural into the depth precisely with the forming calcium carbonate, which was transparent this time. This is why the white areas as well as other pigments on the surface of the intonaco bound with the calcium carbonate crust have a glass-like appearance, do not smudge or crack, as happens with the thick pasty applications of lime whitewash (figures 137, 139).

The areas depicted in the buon fresco technique (figure 151) are difficult to find in Quaglio's wall and ceiling paintings, since traces of the first whitewash layer or layers were found on all the intonaco planes (figure 152), on which he continued to paint by using the red preparatory drawing.

Why did Quaglio insert this layer if there are typical signs to be found of a transfer of the image onto fresh plaster? By applying the thick, lime-rich whitewash onto the wet intonaco, Quaglio (most probably his assistants) provided additional moisture, and particularly slaked lime, to the top layers, therefore prolonging the drying process – with the added lime encouraging the formation of a more prolific calcium carbonate crust. The fact that they began painting onto this layer as quickly as possible is confirmed by the flighty red brush strokes in the sketch dividing the coloured areas (figure 156). From here on, Quaglio had more options in painting than if he were only tied to the drying time of the intonaco (figure 153). He was able to use a watercolour or impasto painting style by adding milk of lime or even coloured lime whitewashes, since as long as all the layers were wet along the vertical axis, the transfer of slaked lime and water could take place from the depths outwards towards the surface. Even when this process of drying out and hardening of the intonaco and the plaster layers beneath ceased, the painter was still able to inpaint the surface, since he continued to paint using a lime tempera by additionally moistening the surface, utilising milk of lime or thicker whitewashes as a binder.

If he did not work too much beyond the duration of time needed for the intonaco to dry, then all the layers on the surface bound to the intonaco and the calcium carbonate crust through the first, thick basic whitewash (figure 157). Quaglio knew from experience that any mistake with a premature drying out of the intonaco would mean that the unsuitable plaster would have to be removed, the plaster would have to be applied anew, and the same scene would have to be repainted. When the weather was favourably cold and wet the duration of time available for painting was substantially extended, so that more time remained for the inpainting of details.

Quaglio cleverly combined the traditional, knightly discipline of painting with the forever increasing demands of patrons wanting elaborate, forever more animated and richly sculptured murals into a technique that enabled the artist to paint in a special way that came closer to easel painting. The painter chooses himself the amount and pace of work and can depict his idea immediately as opposed to having to plan its execution because of unsuitable ground for the next day, or later.

If by studying the numerous details in the wall and ceiling paintings of the vault we attempt to define the key characteristics of how Quaglio's work took shape, we could say that his starting point was always the execution in the buon fresco technique, since he was well aware that this was the technique, which was most permanent on a wall. The whole of his mural uses the wet ground of a lime whitewash as its starting point. All the paintings within the giornate were essentially conceived to be executed in a time which assured quality carbonisation of all layers. Due to numerous factors that had an effect on the execution of work, particularly high temperatures and air humidity, Quaglio was able to extend and adapt the execution of the wall and ceiling paintings to the conditions in the building, by adding a layer of calcium hydroxide onto the surface of the intonaco. Thus a whole range of techniques can be found on the vault mural, from a buon fresco, to painting onto lime whitewash applied to already dry plaster.



Figure 154: A typical surface with a basic coating of lime whitewash. Already here, on the yet to be painted surface, split off particles of the whitewash can be discerned, particularly visible are the tiny dark stones, probably the constituent part of the whitewash. Although perhaps these poorly adhering particles, which would have otherwise fallen off by their own accord and disturbed the painting process, were intentionally removed from the top layer by brushing (HUDOKLIN 1955, p. 39, fig. 37).



Figure 155: This is not a trace of a drawing impressed through the cartoon, but an incision into fresh plaster.



Figure 156: The red brushstrokes have cut deeply into the thick white-wash in places. The grooves half-covered by later whitewashes could mislead us to the incorrect assessment that these are traces of the drawing impressed through the cartoon.

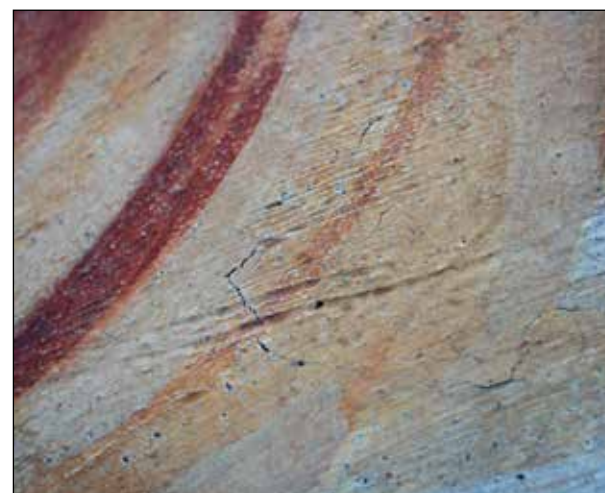


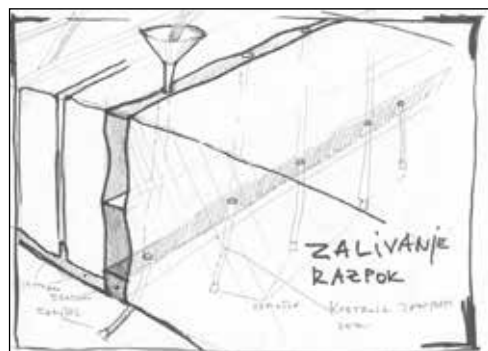
Figure 157: With a quick, be it watercolour or impasto, manner of painting onto lime whitewash, the colour layers and the lime-rich whitewashes are bound into a hard crust.



Figure 158: The layers of whitewash, applied to the already dry intonaco and basic whitewash, did not adhere to the ground as well due to the carbonised surface. Their adherence was assured only by a thin, weak layer of calcium carbonate, which took place within individual whitewash layers, therefore resulting in the flaking and peeling of the weakly adhered top layers of whitewash.



Figure 159



Figures 160a, 160b: Injecting of cracks from the top (attic) side of the vault.



Slika 161

THE REPAIR OF DAMAGE – CRACKS

Numerous longitudinal cracks, which ran in parallel along the whole length of the nave, were appropriately prepared and filled with lime mortar. After inserting tubes from the underside (figure 159) and the top side (figure 160a) a suitable material was micro-injected. The sketch (figure 160b) shows the injecting material being poured from above through a drilled crack. Tubes were inserted into the drilled holes from the underside so a watch could be kept as to whether the cracks were totally filled. Before filling the cracks, the entire vault in the attic was thoroughly cleaned. With the years, several tons of material had accumulated in the attic. Filling channels had to be drilled through the cracks from the top side to the underside, and this could be done only in places where no danger of vibrations causing additional damage to the paintings was

present. Tiny areas of damage were micro-injected (figure 161), whereas larger areas were filled in layers with mortar of a suitable structure (figure 162). Filling in cracks and adapting the structure of the newly formed surfaces to the neighbouring, original surfaces requires special expertise, which can sometimes be compared to the demanding nature of retouching (figure 163). New ground should not be too smooth nor too coarse, since in both cases this becomes visible and disturbing to the eye despite a well executed retouch. There were quite a few surfaces on the vault mural, which had cracked similarly to varnish and the colour layer on a canvas support (figure 164). In these regions the plaster was either applied too thickly or was too wet (possibly the sun shone through the window warming it up locally), or had dried more quickly due to various other



Figure 162



Figure 163



Figure 164



Figure 165



Figure 166

reasons. Quaglio painted that part expertly, before moving away about a meter with his brush. When he noticed the cracking of the plaster in a few hours, it was already too late; any kind of smoothing or levelling of the cracks would have caused irreparable damage, since this would cause damage to the delicate calcium carbonate crust, which had during that time already bound the colour particles. Quaglio was well aware of this therefore he kept these cracks since they did not lessen the grasp of the plaster onto the ground. A second type of crack occurred, however, as a result of movements of various structures within the building, in this case the brick vault (figure 165). The once already filled cracks (repairs after the earthquake in 1895) cracked again on both sides due to these movements, even though microscopically small (figure 166).



Figure 167: Visible traces of arch painting before probing.



Figure 168: The removal of whitewashes – a part of Quaglio's mural crosses over onto the triumphal arch wall. In relation to the mural's crossing over the edges of the actual architecture attention must be drawn here to the three-dimensional additions that were found in certain regions, usually on the edges of the lunettes (clouds, the end of the side of Andrew's cross ...).



Figure 169: Condition after the removal of whitewashes.

THE TRIUMPHAL ARCH WALL

Already at the onset of work on the triumphal arch, it was noticed that a hardly visible decorative mural shone through the top layer of whitewash. After the removal of these layers it was found that this was a tonal stencil painting, which had been originally depicted more sculpturally with the wish to create a three-dimensional effect of gilded stucco ornamentation. Given the fact that, after the removal of the top layers of whitewash, not enough data was available for a complete reconstruction of the original pattern, a decision was passed together with the art historical profession³⁴ to preserve the mural in the range as had been found, that is without intense shadows or highlights, only matching all parts of the pattern – which is the reason why the newly discovered painting has not been preserved to the same extent along the whole of its length. An investigative study³⁵ was produced on the set of problems relating to the renovations of this decorative mural on the triumphal arch.

It must be stressed that when the whitewashes on the triumphal arch wall were removed, numerous large and small cracks were discovered that had already been walled in. The density of these cracks was greatest on the apex of the triumphal arch. The cracks filled with mortar were visible only on the top and bottom profiles; there were none in the middle painted region, which means that a decision had been taken during previous repair work on the triumphal arch to apply a layer of new plaster due to the great number of cracks. A similar decision was accepted by the restorers of those times also on the western wall, only that here also the mural was whitewashed, which indicates that renovation work was undertaken straight after the earthquake, or more probably at the beginning of the 20th century (Anton Jebačič). Attention must be drawn to a large and deep crack discovered during our conservation-restoration treatment. It can be seen (figures 170, 171) from footage that its depth measures around 80 cm and more. Obviously it is a kind of decomposition of the layers of construction of the triumphal arch. This crack, and all larger areas of damage, were hand-injected with mortar based on hydraulic lime. Attention must also be drawn to two almost symmetric more prominent cracks in the northern and southern part of the triumphal arch wall, which proceeded downwards somehow towards the springing of the arch. Both were monitored as part of the measurements of the crack expansions during the time of the project. Only the frontal surfaces were treated on the triumphal arch wall, despite visible damage disturbing to the eye that had occurred due to leakage, since the inside of the arch was not accessible from the existing scaffold.

WESTERN WALL

On the opposite western wall, surfaces featuring similar profiling were heavily damaged, since here the wide cracks extended also over the edges of the two depicted scenes. The wide and deep cracks that had occurred during the earthquake in 1895 were carefully filled with mortar during the post-earthquake renovations, but since these areas of damage were too numerous to be concealed by quick treatment without restoration work, they were simply whitewashed together with the damaged arched profiling of the western wall. It was only a few years after that when they

³⁴ Cf. Memorandum from the consultation committee meeting on 1 July 2005, ZVKDS RC archive.

³⁵ Cf. Chapter on the set of problems relating to the triumphal arch mural: SITAR 2004–2006 a.



Figures 170, 171: A more than 80 cm deep crack.



Figure 172: Black and white image with a visible pattern of the mural in its lower edge (Cf. paper: Mateja Neža Sitar, *The history of the restorations of wall paintings*).



Figures 173, 174: After completed treatment on the triumphal arch wall.



Figure 177: Flaking of the plasterwork and typical patterns of the raster of brickwork in the north-western corner.



Figure 178: Samples of the colour layers were taken from the wall and ceiling paintings and the areas where typical damage had occurred (ROPRET, 25 February 2004).



Figure 175, 176: Filling of numerous cracks.



Figure 179: By probing it was discovered that the profiling on the larger arch, the profiling along the windows, the capitals, and the marbled surfaces on the pilasters had been an ochre colour.

were again uncovered from the whitewash by painter Anton Jebačič³⁶ during renovation work on the occasion of the celebrations of the 200th anniversary of the consecration of the Baroque cathedral. The decision for whitewashing the damaged wall and ceiling paintings on the western wall was most likely based on the findings that the first stage of the post-earthquake renovations had to include the repair of the building's most urgent structural problems, and that the aesthetic aspect of the damaged surfaces could only be taken care of after that. Since the masons did not have to take any particular care with filling the cracks in order to not damage the wall and ceiling paintings, they were able to rush ahead with work. Fortunately Quaglio produced the mural on the western wall in the buon fresco technique, with ample lime plaster which performed a good job of binding the carbonising top layer with the pigments into a smooth, glass-like surface, onto which later whitewashes did not adhere very well. Here Quaglio could afford to use a thicker plaster as his ground for the mural, which meant more lime and the formation of an ampler and thicker calcium carbonate crust. On a vertical wall, the forces of gravity do not pull the plaster away from the construction as much as at locations towards the top of the vault. Towards the top, besides the problem of the weight of the plaster, also the problem of its overhasty drying process occurred due to the relatively thin layer of construction material, which dried out more quickly than was necessary under the influence of higher temperatures. Clearly not the entire western wall was renovated during Jebačič's renovations at the beginning of the 20th century, since

³⁶ LAVRIČ 2003 a, p. 59, fn. 305

the lower positioned fresco, which is today concealed by the organ, was only discovered in 1911 when the organ underwent restoration.³⁷

The filling of these numerous tiny areas of damage, together with the repair of the larger and very deep cracks (figure 175 and 176), was demanding and time-consuming.³⁸

Besides the cracks, heavy traces of prolonged leakage of meteoric waters through the vault's construction could be seen in the corner, at the junction of the western and northern wall with the vault (figure 177). The traces of strokes of hammers and chisels across the whole of the western wall were clearly visible at the beginning of our restoration treatment (figure 178).

³⁷ LAVRIČ 2003 a, p. 60, fn. 306.

³⁸ Restoration work in the region of the western wall was undertaken by academic restorer Darko Tratar and his team as part of the project headed by the Restoration Centre.



Figure 180: The western wall after the renovations of the wall paintings and architectural parts.

QUAGLIO'S PAINTING PROCESS

With all the precise descriptions on the construction of the new Baroque cathedral and further precise descriptions of Quaglio's completed wall and ceiling paintings in the interior and on the exterior of the building,³⁹ no exact date for the beginning of painting the vault and western wall could be tracked down. Therefore one can only make deductions as to when painting of the nave on the scaffold was begun based on records on the execution of Quaglio's works in the transept and on the western wall, and the work of craftsmen, particularly stucco workers. According to sources,⁴⁰ masons began plastering inside and outside the church (although the exact locations are not specified – it can be foreseen, however, that work included the walls of the chapels and tribunes, probably also the plastering of the lower side of the vault after stripping), whereas stucco workers completed all work in the Corpus Christi chapel by 10 June. Because Quaglio had to wait for the stucco workers to finish their work (had it been otherwise, irreparable damage would have certainly occurred on the surfaces of the frescoes during the execution of the stucco ornamentation), he probably tailored his time in relation to how other work in the church was proceeding. It can be anticipated that he completed all work in both side altars of the transept by 29 August 1705 (Saturday), since he received payment for his finished painting in the altar of the Corpus Christi on that day. It can therefore be inferred that the more intensive work for Quaglio in painting the wall and ceiling paintings of the vault began on Monday, the last day of August 1705. Whether Quaglio began with preparation work, initial measurements and outlining of the mural before this date still remains a secret. Since the scaffold was already erected for vaulting, it is very possible that Quaglio followed the construction and plaster work on the vault, since the support for his paintings was in effect being prepared through this work. The masons had to plaster the vault as carefully and to as high a standard as possible, ensuring a quality grasp of the first layer of levelling mortar and as thin an application as possible. A too thickly applied layer of plaster would with time cause lifting and flaking of the plaster together with the wall and ceiling paintings due to the forces of gravity.

It is equally puzzling that there is no note on whether he arrived in Ljubljana on 10 May 1705 alone or with assistants, as he spent the last of the winter months at home in Laino intensively preparing material for painting the large surfaces of the Ljubljana Cathedral. He must have anticipated that the transfer of his sketches and preparatory drawing would require one or more reliable assistants; therefore he counted on the already inducted and well attuned group of people that he trusted. It would have been unlikely for him to have found the time to train

assistants in the haste of painting. It is true though that Carlo Carloni is mentioned as receiving a tip of one gold coin and four florins with Quaglio's last payment in that year on 9 October. Unfortunately there are no more precise descriptions on the goings-on on the scaffold, there is also no note on how much of the surface of the vault and western wall the painter managed to cover before his sudden departure home spurred on by illness on 9 October (even though the evidence on payments states – food for the painter from 10 May to 12 October). The account on his leave is also surprising: “*I...even though he had prepared himself to finish the great work on the nave vault, I...!*”⁴¹ From all the records on the payments to the painter, and with quite an accurate list of executed works, it would be possible to determine also how Quaglio estimated and charged for his work: all painted surfaces would have to be spread out, compared according to size, the degree of difficulty in relation to the size of surface, number and size of figures, movement of drapery, usage of precious and rare pigments and the manner of execution itself. What is meant with the manner of execution is namely the technique used in the wall and ceiling paintings – whether it was precisely specified in individual contracts in which technique the mural should be painted. Or was it just noted that the artist had to cover a certain surface area for which he would receive payment. It would also be interesting to find out whether it was mentioned in these contracts or agreements that the patron should assure a quality mason, who would prepare a fresh intonaco for the painter as work proceeded, even twice daily if required.

A rough assessment of executed works on the vault and western wall can be calculated from the list of payments to the painter,⁴² since we know that on 24 November 1704, just before his departure home, he signed a contract for painting the vault and western wall for 2000 florins and 50 gold coins, and another 200 florins for the Corpus Christi altar. In 1705 he began working immediately upon his arrival on 10 May, commencing with the base of the Corpus Christi altar and the western wall of the nave.⁴³ On 7 July he was paid 340 florins for the ceiling paintings (or the western wall?), on 29 August he received 200 florins for the completed painting on the Corpus Christi altar, which means (if we assume that payment was always made after work was completed), that he may have interrupted his work on the vault in order to work on or complete the Corpus Christi altar, which may be linked to the work of the stucco workers in the transept. On 9 October 1705 he was paid another 660 florins, but Quaglio unexpectedly set off home (on 12 October?) due to a reoccurring fever. It is unknown how this affected the work pace on the scaffold and for how long the signs of illness reoccurred before he decided to return home, however, it can be assumed that the painter was under a lot of pressure, at least at the start of work on the vault, despite being experienced in working on large surfaces. The measuring and drafting of

points in the space, which represented the basis for the continued build-up of the composition, and the adjusting and checking of the drafted solutions that he had planned in Italy over the winter in relation to the actual measurements of the church vault in Ljubljana most certainly required exceptional effort. Did problems or technical difficulties of any kind occur during his work? Was he satisfied with the prepared ground? Was he provided with enough skilled assistants in Slovenia for quicker and easier completion of tasks? Perhaps more details will be found in the future by reading and analysing the receipts for the purchases of material with more precision, as well information on the materials that Quaglio brought with him and those acquired in Slovenia.

If we return to money and count out 200 florins which he received for completing his painting work in the Corpus Christi chapel, he received for his work on the vault and western wall in 1705, up till his sudden departure home, another 340 florins (7 July) and 660 florins (9 October), which amounts to exactly 1000 florins. A rather unusually rounded off number, particularly if we deduct from that number 2000 florins and 50 gold coins for painting the entire vault and western wall, and so find that Quaglio received payment for exactly (apart from the 50 gold coins) half of his executed work. We can suppose that this included the finished paintings on the western wall as well as some of the vault – but how much? If we know that the surface of the vault measures about 540 m², and the surface of the western wall 60 m², we obtain a surface ratio of 9:1, which means that the value of 2000 florins can be split into 1800 florins for the ceiling and 200 florins for the western wall. We if again return to the payment of 7 July 1705 (340 florins) we find that by that date the work on the western wall (200 florins) was completed and the work on the vault was executed to the value of 140 florins. Up till October he received another 660 florins for his work, which amounts to 800 florins. If we divide 2000 florins with the surface of 600 m², we get 3.3 florins per m². For the sum of 800 florins he therefore painted 240 m² of the vault's surface. Of course this is only an attempt at a rough assessment to understand the dynamics of Quaglio's work on the western wall and top of the nave, without any analyses of relations between payments for work performed, surface area covered, level of difficulty of painting, and time frame of executed works in the presbytery, transept and side spaces of the presbytery. A comparison of results obtained with information on the paintings of the ceiling and western wall would certainly additionally illuminate Quaglio's method of work and his passage from depicting framed painting to working in a much larger, less structured format. A precise investigation could determine which areas of the mural were deemed as more difficult at that time, and which regions were perceived as merely decorative.

The following year he arrived in Ljubljana a month earlier than the previous year, on 11 April 1706, also bringing with him Carloni, and continued work on the vault upon his arrival. He received a payment of 500 florins of German value already the following month (11 May 1706), and another 400 florins in a month and a half (29 June).

On 19 July 1706, judging by records, the scaffolding was pulled down

(however, it is not known which and how many parts, or all parts at once, or whether some parts of the scaffolding were left standing to enable viewing from up close) and the audience was, for the first time, able to view and admire the extensive work of art. Since that day was a Monday it is probable that Quaglio finished his work a day or so earlier. According to sources, after almost a month, he also completed the lower fresco on the western wall, therefore his work was rushed since there was already a ceremony held in the Corpus Christi chapel on the following day. For his completed work on the vault and western wall (lower part) he received 100 florins, which amounted to 1000 florins all together. He received a separate payment of 82 fl. and 30 kr.⁴⁴ for additional work. Carloni's tip at the end amounted to exactly twice the sum of the previous year that is 2 gold coins and 8 florins.

In order to complete the wall and ceiling paintings in 1706, Quaglio required another three and a half months.

Quaglio's arrival in Ljubljana on as early as 11 April can be explained from a totally technological aspect. Low temperatures and wet, rainy weather are favourable conditions for fresco painting due to the reduced evaporation of water from the plaster and therefore a more ample formation of the calcium carbonate crust as the pigment binder. Since that year everything was ready to continue work, he tried to hasten and finish before the onset of high temperatures, which would dry the plaster too quickly. The rule that the build up of the fresco begins at the top proceeding downwards was used by Quaglio in painting the upper parts of the mural during the first cooler months, when he depicted the highest located longitudinal region at least up to the height of the figures of the virtues. Namely here the vault's brick wall becomes thicker, is reinforced by the built-in stone boulders, and joins onto the one-meter thick walls of the nave. This great mass of connected material was slow to react to the fluctuations of temperatures, which could have meant that the mortar on such walls dried more evenly. The brick wall is only 20 cm thick at the top, meaning that it was more susceptible to contractions and expansions than the lower part of the vault. Therefore the longitudinal cracks on the nave vault are quite a frequent occurrence, whereas the abundance and width of the cracks depends on the size of the vault.

³⁹ LAVRIČ 2007. All previously mentioned dates are summarised according to Dolničar's *Historia* and the dean's *Accepta et exposita in novam fabricam Basilicae Labacensis ab Anno 1700 usque ad Annum 1713 /.../*: DOLNIČAR 2003 and LAVRIČ 2003, pp. 443–495.

⁴⁰ DOLNIČAR 2003.

⁴¹ DOLNIČAR 2003, p. 308.

⁴² STESKA 1936, pp. 143–144.

⁴³ LAVRIČ 2007, p. 13.

⁴⁴ LAVRIČ 2003 b, p. 471.

LIGHTING

Quaglio required some kind of level of lighting of the vault surfaces, which he attained by procuring natural and probably also artificial light. At the start of his painting work in 1705, the construction of the scaffold required for the uninterrupted work on the nave vault measured 20 metres in height and 14 metres in width, and was actually erected to a height where the vault begins to arch, since the masons required such a mighty scaffold to make the cladding. After stripping and removal of the supporting structure, a hall-like space was created at the height of the cornice, open enough for Quaglio and his assistants to sketch out a new outline for their composition. It is not known how the scaffold or scaffolds were prepared for Quaglio's work, since sources do not include any details on how work proceeded on these surfaces, despite the fact that the descriptions of his daily depictions are accurate to the day. Because the scaffolds were constructed of wood it can be assumed that the thicket of supporting beams and transverse planks almost totally blocked out the inflow of light through lower positioned openings. The only natural lighting of the work area came through the eight windows on the south side and the large window on the western side, which replaced the loss of light coming from two walled-in windows. Assuming of course that Quaglio's platform, similar to ours, was placed at a height somewhere under the window openings. It is unlikely that this secondary scaffold would have been erected in a fixed position enabling reach to all areas of the vault surface, since this would mean that Quaglio would have remained in almost complete darkness. According to our experience, the level of lighting of the vault surfaces in the scaffold's region was, because of the tightly fitting movable scaffold on several levels, reduced to such an extent that work was not possible without artificial lighting on the brightest sunniest day. However, if the weather outside was very cloudy, then work (without artificial lighting) was impossible also on those surfaces not covered by the fixed or moveable scaffolds.

The issue of lighting the surfaces was in those times solved by using resin coated wooden strips or oil lamps, and candles of course, which, however, did not emit enough strong light on their own. Lighting with a greater number of candles or oil lamps resulted in smoke and consequently soot. The collecting of soot on the freshly painted surfaces was perhaps prevented by spreading out a fine white fabric high above the flames, which was not only used to catch the soot, but also to diffuse the light more proportionally. Of course additional lighting also had its bad side – it projected unwanted shadows onto the vault's surfaces.⁴⁵

Questions on how the work surfaces were lit during Quaglio's time were raised frequently during our work, particularly on cloudy days given that we could not achieve a satisfactory level of lighting despite numerous electric lights. Yet another reason to admire an artist who was certainly no stranger to such problems during his work and was appropriately prepared for them. It would therefore be more convincing if Quaglio's scaffolds were positioned so that light could enter the space optimally through the windows, hence not blocking them with the scaffold's construction. By using pieces of polished sheet metal or mirrors light could be directed towards those regions that were less well lit. The paint for the larger surfaces, particularly architectural parts, sky, frames was mixed and kept in stock. This avoided the problem of having to constantly mix precisely defined pigments, since a natural and strong light was required for the precise matching of tone and colour. This leads us to favour the idea that Quaglio used several moveable or portable scaffolds during painting. He checked his work, like many before him, by viewing the depicted scenes from the ground through removed panels on the painting scaffold. Quaglio painted on a scaffold which was much simpler than today's scaffolds in terms of technology, nevertheless it allowed for occasional movement. Since the technical capabilities of lighting were modest, he had to optimally use the openings of all the eight windows of the nave and the larger one of the western wall. Given that large groups of workers were constantly at work on the construction, the moving of the smaller scaffolds probably presented no problems. It is most likely that he also had a space on the scaffold for drafting quick ongoing adaptations of the composition.

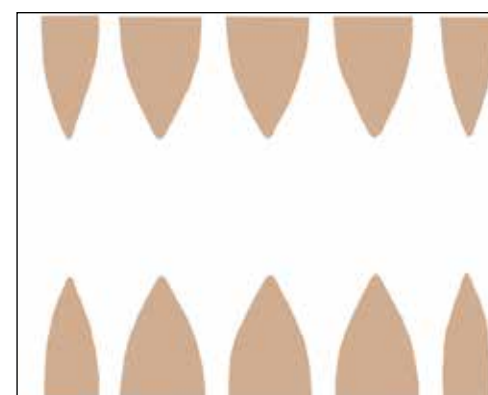


Figure I

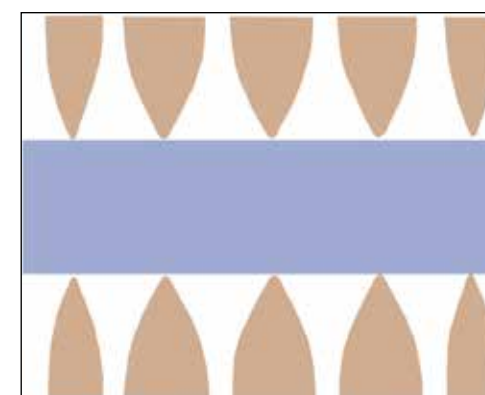


Figure II

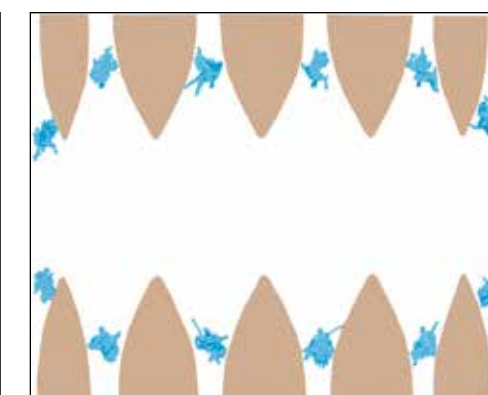


Figure III

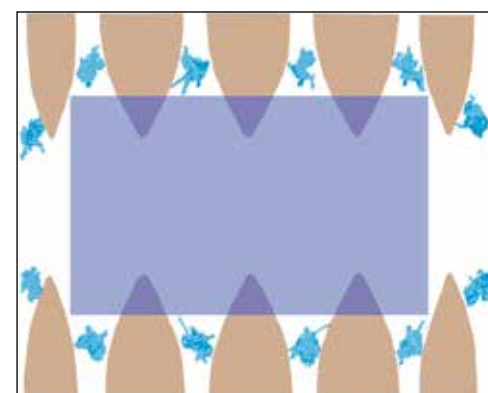


Figure IV

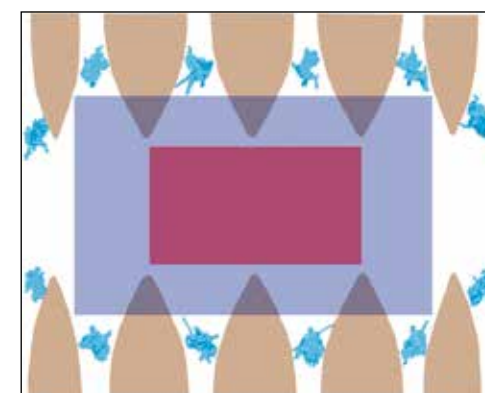


Figure V

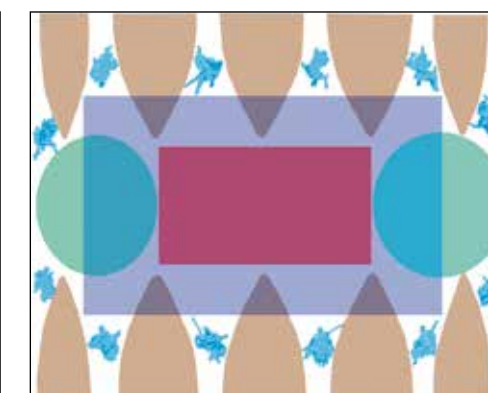


Figure VI

PICTORIAL OUTLINE OF THE VAULT

In his outline of the vault plane, Quaglio had at his disposal less than two thirds of the entire surface at the same level (figure I), since the receding planes of the lunettes and vaulted surfaces cut deeply into a semi-circular arch, thus heavily impacting on the composition as a whole. The rectangle, whose surface would not be broken off by the lunettes, would measure 7 x 25 m (figure II), however, such an elongated format would hamper the representation of the space which seemingly lifts up. Because of the varying widths of spaces between the lunette arches, as also the western and triumphal arch wall, Quaglio had to depict the apostles a little higher up here than on the other surfaces due to the lack of space, the two triumphal arch ones even somewhat higher than the two western ones (figure III). When he found an appropriate scale for the figures of the apostles and determined their exact positions by experimenting, he was able to draw in a large rectangle above the central eight (figure IV), inside which he placed another smaller one, seemingly positioned inside the space (figure V). Inside both of the irregularly circular surfaces (figure VI), by using painterly means, he attempted to reduce the curvature of the actual arch so that he seemingly arched both external cornices, hence persuading the viewer that the figures depicted inside this cornice were further away. In Quaglio's actual vault mural, the edges of the larger frame and external circular surfaces are joined into a wide external frame that separates the space of the depicted apostles from the others. The division of the vault's entire surface into large individual parts was vital since the complex technique of execution could, without prior planning, cause problems which would be difficult to correct at the end of painting.

Although Quaglio was not tied to the stucco frames in the process of painting the vault, the outlining of the composition into smaller units was very important. Figure 181 shows Quaglio's gradual sequencing of levels in the illusionistic space, which is at its most obvious inside the two circular surfaces, since it immediately directs the viewer's gaze past the active figures almost vertically towards the sky. Somewhat less steep is the rising direction of the group around Christ on the Cross, which together with a group of angels rise up towards the central, top-most point from the opposite, western direction. Along with the skilful use of strong lighting contrasts, sharply defined line and a colourful palette, which are all successfully incorporated into the depicted frontal scenes, Quaglio's perspective techniques in depicting air and colour to achieve the appearance of far-off objects are, however, less expressive. Particularly difficult to understand is the insertion of the brown-green depicted frame with curved sides in the central part of the vault, which has been painted too sharply and is very bright, particularly in relation to the green medallions with a red-brown border. By using less colourful tones and less harsh contours, Quaglio could have softened and at the same time seemingly pushed the mentioned objects of the depiction further into the space.

Figure 183 shows the emphasised drawing of architectural elements incorporated into the depiction of the vault. The illusionistic space, whose sides run towards the middle, is depicted quite clearly, whereas here the lines stop at the plane with the drawn in curved frame. Besides the aforementioned colourful tones and sharp outlines, which bring the object closer rather than take it further, Quaglio did not add anything to this rectangle that would direct the viewer's gaze towards the heights. Figure 184 shows one of the options which would, by adding a simple drawing, enhance the feeling of depth of the illusionistic space.

⁴⁵ Confirmation as to the type of fuel and additional lighting may possibly be found by carefully reading the list of used material and payments for oil (vegetable – rape or similar), since petroleum and similar fuel began to be used much later. Cf. also DOLNIČAR 2003, p. 307, where lighting interiors with torches and various lights is mentioned.

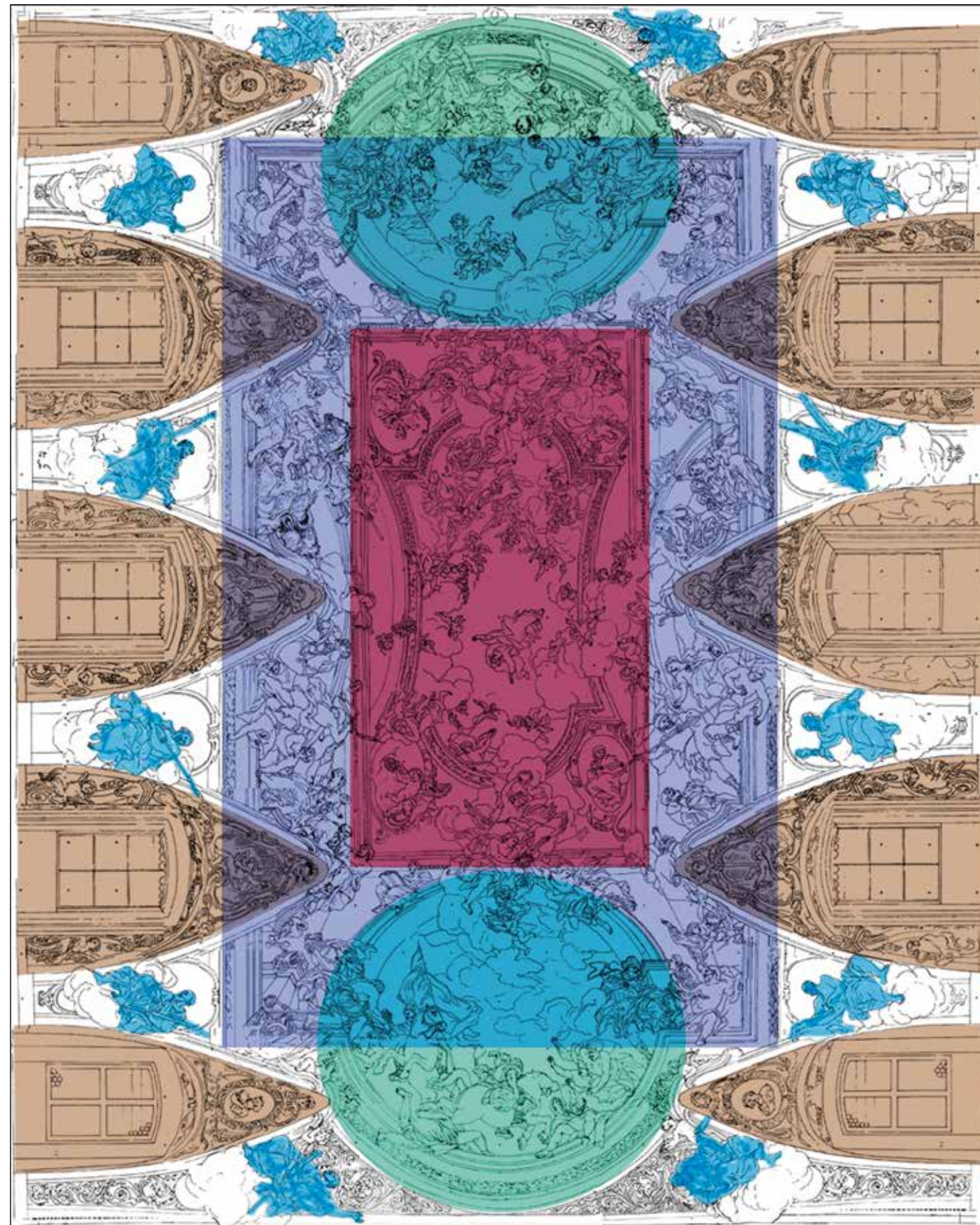


Figure VII

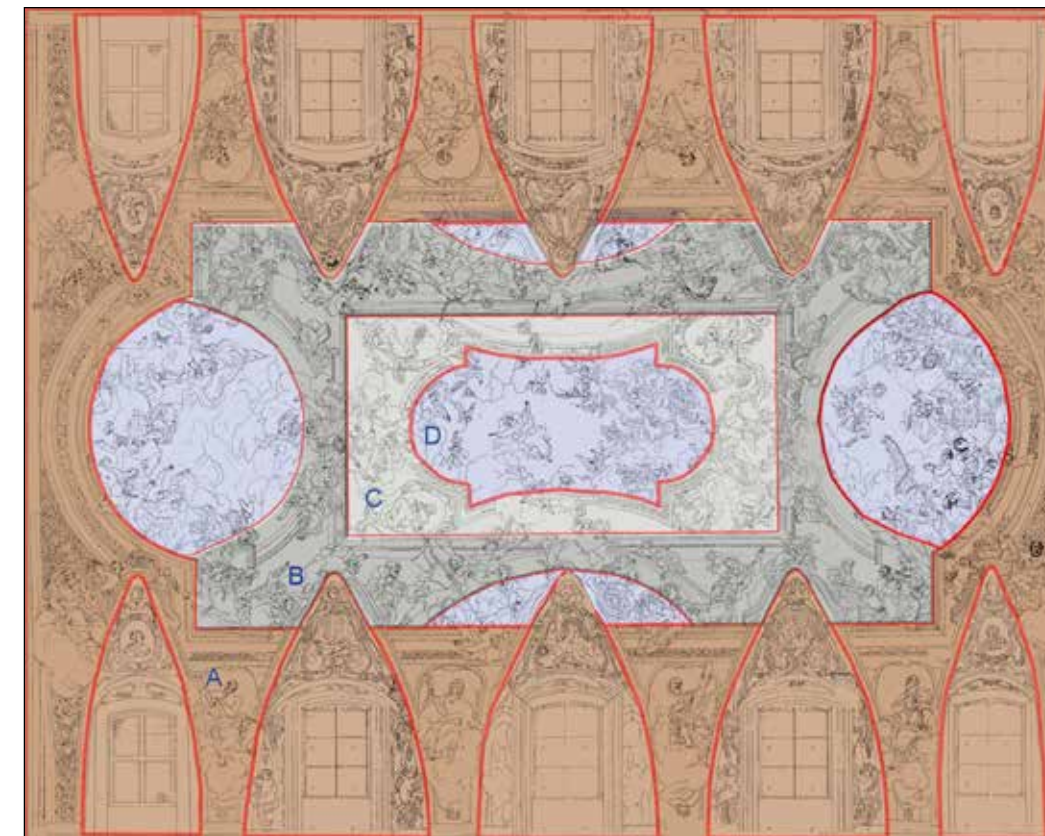


Figure 181

The division of the vault surface into spatial planes (figure 181), which would be seemingly further and further removed from the viewer: **A** – first plane, bound and limited to the architectural outline of the lunettes with windows; **B** – a rising, at the sides semi-circular and in the middle rectangular; open space; **C** – a plane without the indicated spatial shortenings of architectural elements, with a section shaped like a decorative frame, which incomprehensibly stops the viewer's gaze directed to the heights on a curved profile, which is additionally reinforced at the corners with red-brown edged green medallions; **D** – final plane.



Figure 182: The vault painting after completed conservation-restoration treatment in 2006.

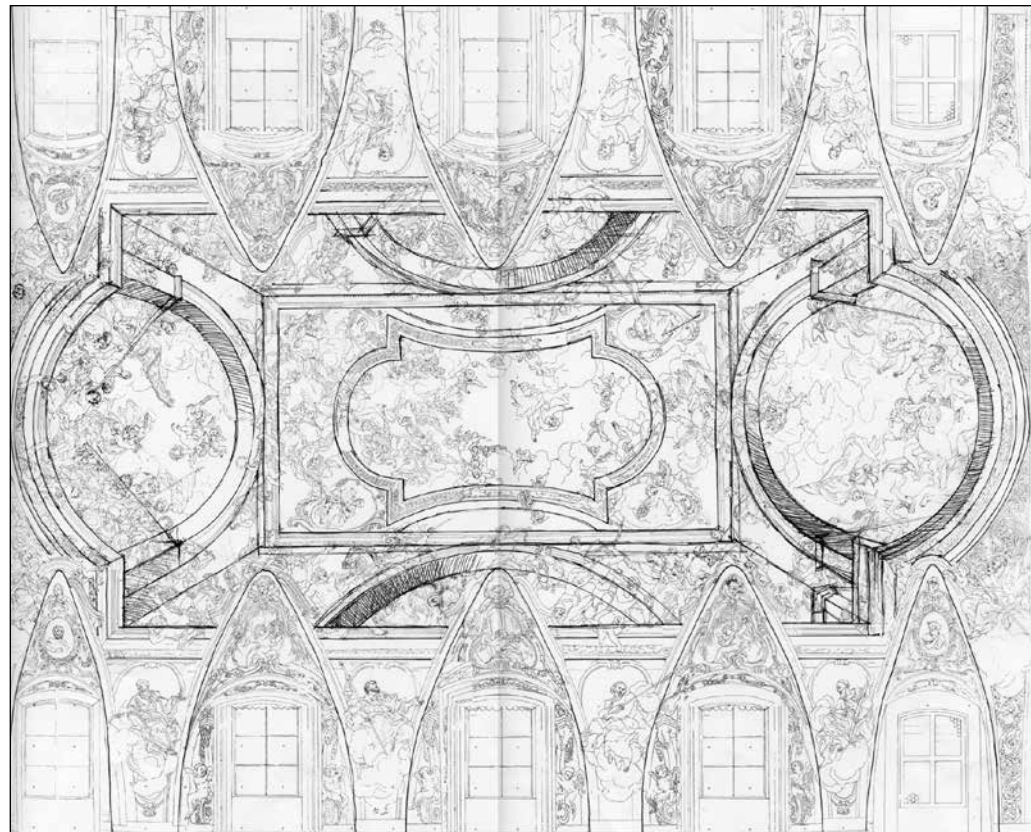


Figure 183: A draft of the depicted architecture on Quaglio's existing mural (drawing R. Zoubek).

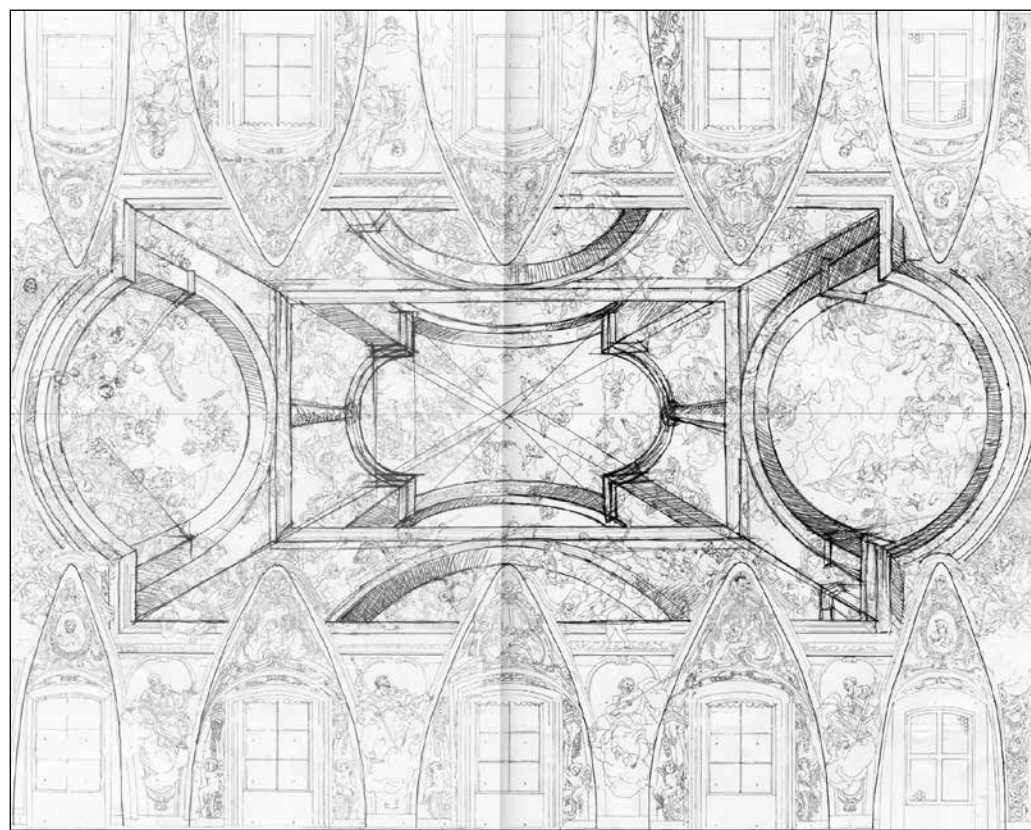


Figure 184: A possible solution for a simple adding of depth of space by lengthening existing architecture (drawing R. Zoubek).



Figure 185: Careful removal of dust and other impurities above the northern walled-in window.

MECHANICAL CLEANING

The first attempts of mechanical cleaning were carried out in easily reachable areas and relatively firmly painted surfaces by means of probing (figures 186, 188) using Wishab sponges of various hardness and Wishab powder (figure 189). Prior to that, coarse dust, soot, cobwebs and other dirt was removed by using soft brushes without touching the surface. In the removal of these impurities, micro vacuum cleaners were also used (figure 185). The initial results were quite forthcoming (figures 186, 187), even though such a mechanical method can only be used on unproblematic surfaces. The problematic areas of the wall and ceiling paintings (scaling and lifting, heavy dust and flaking of the colour

layer) were not addressed in the initial stage, since the use of mechanical methods would have caused irreversible damage. Figure 190 clearly shows the difference between the cleaned and uncleaned surfaces. Here the soot-filled cracks stand out; it is very likely that air currents found their way through them, absorbing tiny particles of dust and soot on the way. This assumption is also supported by findings of soot and dust ingrained deeply within larger cracks after removal of old worn out fill material. This proves that cracks were present, at least in the central part of the vault, already before the earthquake of 1895. Figures 191 and 192 document the mechanical removal of impurities by quadrants.



Figure 186: First cleaning probing.



Figure 187: Visible flaking of particles of the colour layer before cleaning.



Figure 188: Comparison of cleaned and uncleaned surfaces.

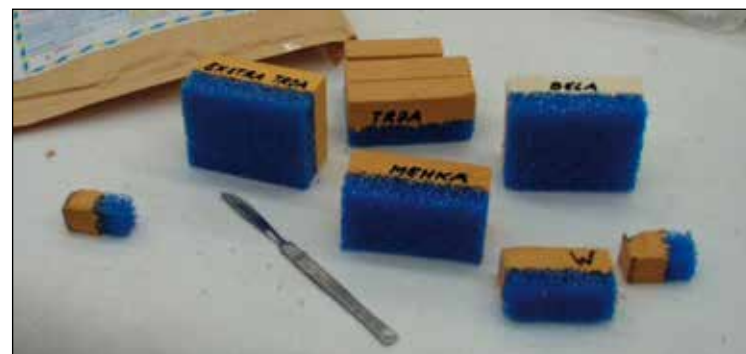


Figure 189: Wishab sponges.

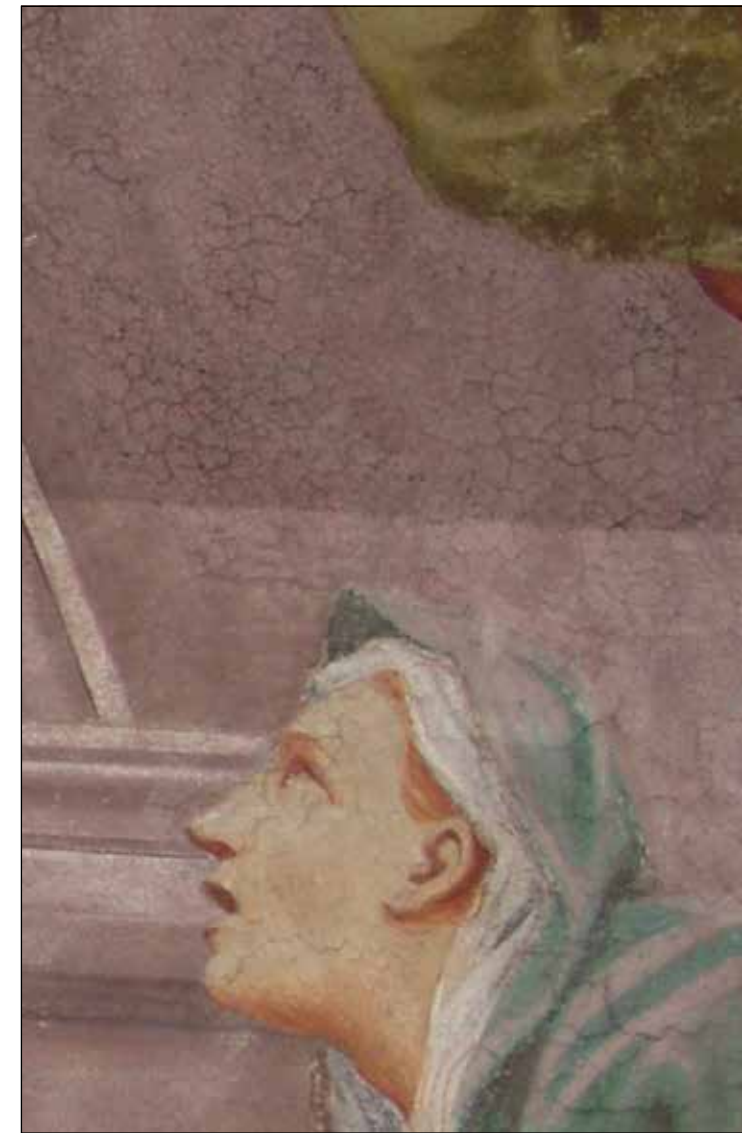


Figure 190a



Figure 190b



Figure 191



Figure 192

CHEMICAL CLEANING

Once all impurities were removed from the entire surface of the depicted vault, it was easier to locate and document the regions that required more attention and the use of various methods and procedures. After numerous experiments with various combinations of cleaning agents, a method was selected that had been used since the 1970s which originates from Italy. Its composition and action are described in numerous expert publications.⁴⁶

Cleaning with active chemical compresses, a method developed in Italy around 1970 by chemist Enzo Ferroni and restorer Dino Dini, had not been used in Slovenia previously so systematically and on such large surfaces. The method was tested in Slovenia for the first time precisely on the renovations of Quaglio's wall and ceiling paintings, aided by the Italian restorers of the Nevyjel & Ragazzoni firm. In the original procedure, a saturated solution of ammonium carbonate is first used, and then barium hydroxide is applied in the second stage. All cleaning procedures on the wall and ceiling paintings by Giulio Quaglio on the vault of the Church of St Nicholas in Ljubljana were analytically monitored.⁴⁷ The procedure using barium hydroxide was not required in this case. The first cleaning experiments using this method began on the vault of the cathedral towards the end of 2003, whereas cleaning itself lasted until the end of 2004.

A more detailed account of the materials and procedures used is recorded in special articles, therefore this article contains merely a brief description of the procedure, which can be seen from photographs. Japanese restoration paper used in restoration was first soaked with a saturated solution of ammonium carbonate in the areas intended to be cleaned (figure 193). The remaining solution was thickened into a pulp with fill material from cellulose fibres and sepiolite, and applied evenly onto the Japanese restoration paper (figures 194, 195). Only some coloured planes were initially covered by compresses since not all colours react in the same way to ammonium carbonate. Safety masks were used during work (figure 196). After some time (which was determined through experiments), the compresses were removed, and the wall and ceiling paintings underneath began to be thoroughly rinsed, most successfully using a sea sponge (figures 197, 198). The results of partial cleaning can be seen in figures 199, 200, 201 and 202.

By changing the strength of the saturated solution, the thickness of application of the cellulose pulp and duration of application, varying strengths of action on the depicted surfaces were achieved.

The essential difference between the previous methods of cleaning the surface of the frescoes and the more recent ones is, besides the use of chemicals, also the manner of removing impurities from the surface of the paintings. In previous cleaning procedures dust and soot were washed and rinsed off with horizontally circular movements using wet cloths, during which process tiny soot particles were rubbed into the top plaster layer, particularly darkening lighter parts to shades of grey, thus reducing the appearance of depth. By using compresses on the other hand the fine paper temporarily fixes impurities onto the surface, where particles remain motionless throughout chemical treatment. After the removal of the compresses (impurities are also lifted off in a vertical motion), comes



Figure 193

rinsing. The possibility of rubbing soot and dust into the plaster are negligible.

After successful removal of all unsuitable overpaints, consolidating coatings from previous restoration procedures, and most significantly removing impurities that had accumulated throughout the years in microscopically tiny particles on the surfaces of the wall and ceiling paintings, the image of the renovated vault once again came close to the one admired by visitors 300 years ago. In particular the greyish veil was removed that had formed due to the unsuitable washing and removal of soot. It is known from experience that washing a wall containing soot deposits causes, despite the greatest precision, some of the particles to remain in the porous and coarse surface of the lime plaster. By means of successful cleaning the light and colour scale was once again restored to the one in the Puštal Chapel or those in the palaces of Udine.

With the removal of impurities and other unoriginal layers (figure 203), all other small and large areas of damage to the colour layer and plasterwork underneath came to light. A wall painting with its ground is inextricably linked to the building itself, therefore its surface mirrors all movements, expansions and contractions of materials. This discord between the again discovered vibrant colouring and numerous areas of damage was managed with considered retouching and as minimal reconstruction of missing fragments as possible. Given the binder used, we could talk of a retouch using watercolours with a well-known binder and a percentual content of this binder.⁴⁸ The method of application, mixing and modelling was similar to watercolour, since underneath layers were dissolved when overlapped. Due to different absorbency rates of the surfaces, retouching proved a cumbersome task, at least in comparison with the use of acrylic binders.

⁴⁶ MATTEINI 1991, pp. 137-148.

⁴⁷ Cleaning was carried out in close collaboration between the RC team and the team of Italian restorers, with constant checking of procedures against chemical analyses ROPRET, 8 January 2004; ROPRET, 19 March 2004; ROPRET, 24 May 2004; ROPRET, 2 June 2004.

⁴⁸ We often read in professional literature and restoration reports that watercolours are used in retouching wall paintings, however, the binder used in these paints is never revealed since manufacturers carefully guard this information.



Figure 194



Figure 195



Figure 196



Figure 197



Figure 198



Figure 199



Figure 200

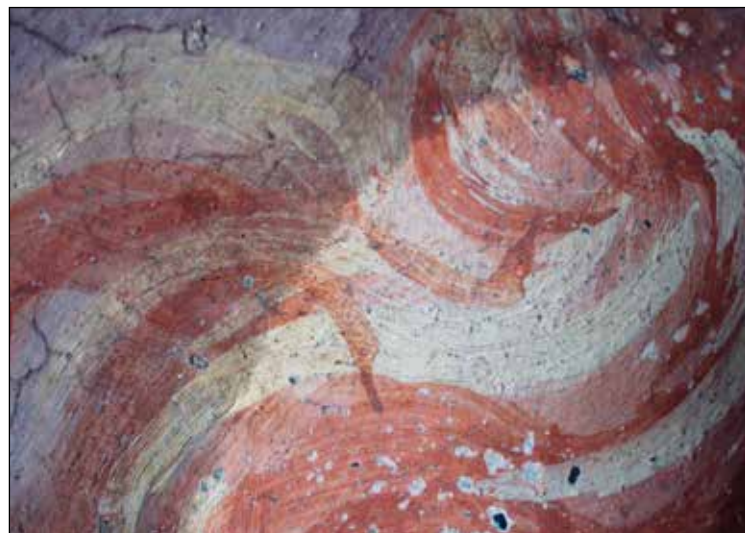


Figure 201



Figure 202



Figure 203: The region above the organ with the thickest network of cracks; in the middle and to the left along the red drapery, darkened retouches from a previous restoration treatment.

RETOUCHING AND RECONSTRUCTION

The choice of binder was accepted on the basis of research on the effects of condensed cycles of temperature fluctuations and relative humidity on potential binders. Tylose MH 300 was the binder that, in comparison with other binders, preserved the typical colouration of pigments as well as a relatively good grasp onto its ground during the extreme conditions of artificial ageing. The choice of binder for such an important, but also extensive, wall painting is neither easy nor simple. After examination of all painted surfaces and the finding that thousands of tiny particles that had flaked off the mural would have to be replaced, we searched for a pigment binder that would not alter after drying (would neither lighten nor darken), so that restorers would not be required to return to the same spots with their brushes in the attempt to mix the correct shade over and over again. The preparation and application of the binder should be simple and pleasant to work with. The artificial ageing procedure was entrusted to an institution with appropriate equipment and necessary references. It would have been ideal of course had there been an opportunity to test out the binders on site by using real ageing and compare the state of the binder and pigments in ten years' time and only then begin work on the wall and ceiling paintings. This option of comparison and monitoring of changes on this binder will be usefully exploited by restorer colleagues during the next restoration procedure on the vault. In the choice of binder it was necessary, besides the results of artificial ageing, to also check the suitability of application onto the actual material, and not just the clean surface provided in the laboratory. The process of selection was carried out clearly and with the overview of both expert committees that monitored our work. In the choice of binder, which would prove technically unproblematic and most compatible with the original, most experts would decide on lime, that is aged slaked lime. However, lime is more appropriate for filling in greater damage, like cracks and larger pieces of fallen off plasterwork, where it adapts well to its surrounding area



Figure 204: Filling of numerous tiny areas of damage.



Figure 205: The production of watercolours on the platform.



Figure 206: Testing of the binder on the lime support.



Figure 207: The first retouching attempts were made with ammonium caseinate.



Figure 208: Retouching of a clean and freshly filled crack from figure 203, where a fill had been used in the previous restoration procedure which had darkened with the years.

especially if mixed with a fill material like sand, by which an adequate hardness can be achieved. As we know, lime whitewash – because of its fine layer and less lime binding than for example intonaco – only forms a very fine and fragile layer of calcium carbonate, a crust that is prone to dusting and flaking off. Besides this, every further layer would not improve the grasp of all the whitewashes onto the ground that had fully carbonised over the three hundred years, which would render retouching using just a lime binder without additional acrylic resins problematic. Here the question arises as to the suitability of using acrylic additives and even binders in the conservation and restoration of the wall paintings by Giulio Quaglio, which could only be answered by a thoroughly prepared and executed study.



Figure 209: Retouching of the antique bust in quadrant P25.



Figure 211: Filling in tiny areas of damage in location O18, N18.



Figure 210: A retouch of the flowers in the location of E14 and F14.



Figure 212: Retouching the angel's wing, K10.



Figure 213: The condition after cleaning, closing of cracks, and the retouching and reconstruction of the mural in the region of the central frame.

From the few reconstructions of the paintings on the vault, let us only mention the most significant two, whose process can be seen in the images.

The first, represented in figure 214, was produced between quadrant 1M and 1N in the western part of the vault, just by the junction with the western wall above the organ. A part of the arm was painted in a darker tone from the original, onto a newer, coarser plaster. The latter replaced

the original, which had fallen off during the earthquake of 1895. During the reconstruction, the restorer helped herself with a photograph of her own hand, which was placed into an appropriate position.

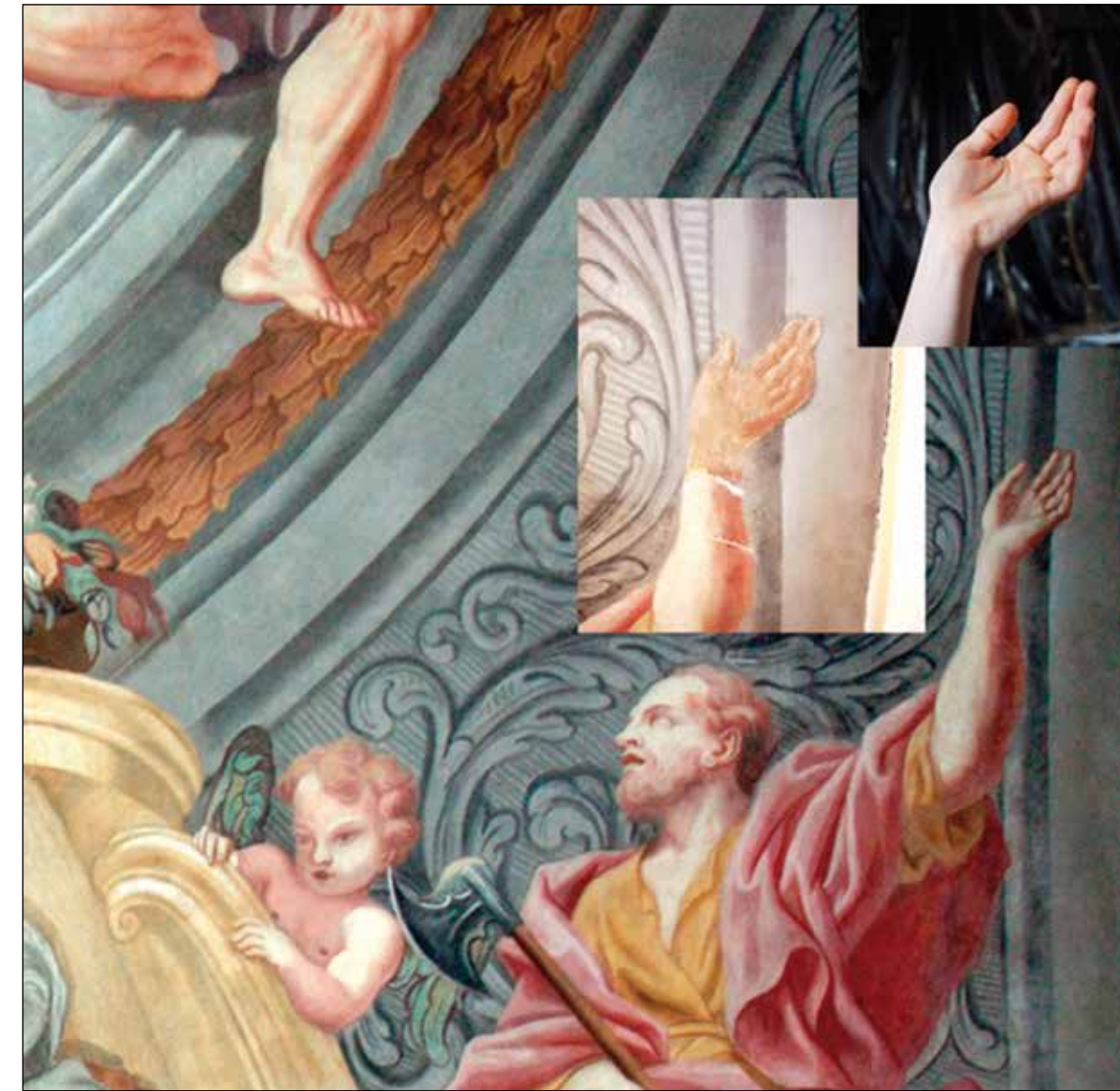


Figure 214: The region of the depicted St Matthew the apostle with a shot of the previous state of the reconstruction of the hand (smaller image above the apostle's head). To the right there is a photograph of the hand which was used by the restorer to produce the reconstruction.

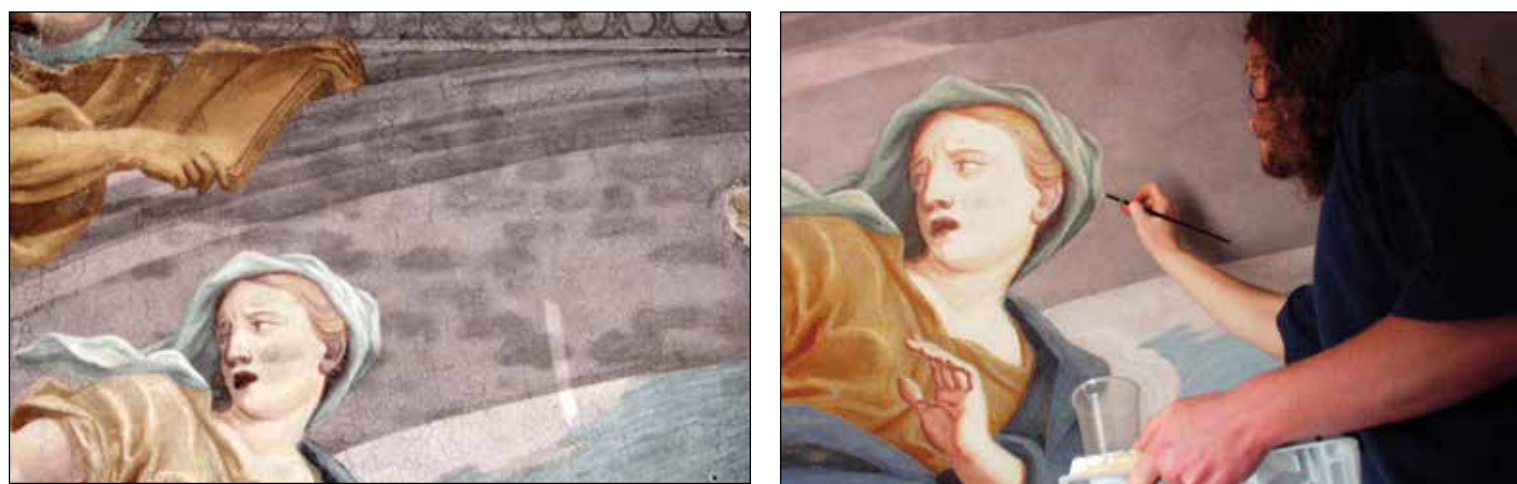


Figure 215, 216: On the northern wall of the vault, more precisely in the region of quadrants G12 and G13, some typical damage occurred due to the infiltration of moisture through variously permeable materials. The state of the mural painting before and after removal of all damage.

The reconstruction of the depicted head of the virtue (the middle of quadrants G8, G9 and H8, H9), which had become unrecognisable due to the great levels of efflorescences and consequent flaking of the colour layer and intonaco, was produced following a preserved black and white photograph. The following pages present some comparative examples from which the extent and success of the performed work can be seen.

It is interesting to note that the worst affected damage on the colour layer and plaster were to be found in the corners of the depicted rectangle above the lunettes, which indicates a possible leakage of meteoric water onto the roof's wooden construction.

The repair of damaged areas, where the lime binding had lost its strength due to permanent moisture causing the plaster layers on the surfaces of the vault to flake off, is extremely challenging. Water soluble salts and other dissolved matter that still lingers in the depths of the brick vault can in the presence of sufficient moisture again begin to collect on the surface of the paintings and plasterwork, dislodging plaster particles and colour layers through the formation of crystals.

After completing work in Ljubljana Cathedral, Quaglio travelled to Puštal near Škofja Loka on 25 September 1706, where he executed the wall painting *Descent from the Cross* in the small chapel of the Holy Cross for his heart and soul, liberated from all the pressures that had accompanied him for all those years during his work in the cathedral. It is worth mentioning the painting because it shows no signs of renovations and, apart from some small damage, displays the image from 300 years ago, where Quaglio's untouched colour palette, expressive hues and highlights, as well as sharp, emphasised and lively contours can be admired. Since the painting is located in a space that infrequently hosts visitors, it is possible that (if moisture does not begin to penetrate into the painted wall from the outside) Quaglio's mural will remain untouched for a long time

and as such a point of departure for all further research and comparison. All those studying Quaglio's painting with its original colour palette and characteristic strokes will be returning to it. Before further restoration work is undertaken in Ljubljana Cathedral, particularly in the presbytery, it would be sensible to produce an exact copy of the Puštal fresco, which could be transferred to the presbytery, where it could serve as a reference, a starting point, for removing impurities and obvious overpaints in the search of Quaglio's original colourfulness.



Figure 217, 218: Before the reconstruction a lime plaster of suitable structure was formed in the area of damage. In terms of coverage, this is the largest reconstruction of the mural on the vault.

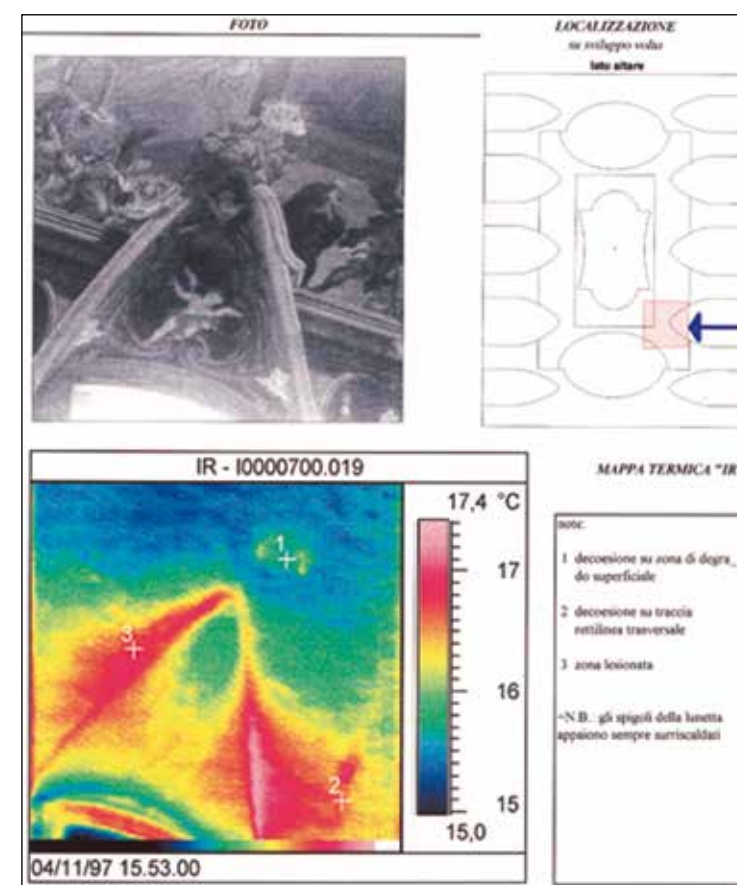


Figure 219: The thermographic record shows the damage caused by prolonged leakage at the top of the lunette in region H8 and H9.



Figure 220: Condition after prolonged leakage through the brick construction with loss of the colour layer in the face and hair area. Damage before treatment.



Figure 221: A part of the refurbished vault mural with included reconstruction.



Figure 222: A personified image of a virtue after the finished reconstruction.



Figure 223: The head of the figure in location F7 with strong signs of efflorescences.



Figure 224: Region F7 after the reconstruction.



Figure 225: Condition before treatment – numerous overpaints can be seen along the larger crack.



Figure 226: Condition after completed conservation-restoration treatment.



Figure 227: Condition before cleaning and retouching – numerous tiny cracks are visible.



Figure 228: Condition after the renovation – the cracks are less noticeable after cleaning and retouching.



Figure 229: Location K23, before treatment.



Figure 230: Condition after the preparations and closing of the cracks, and partial cleaning.



Figure 231: Location J23, condition after cleaning and retouching.



a



b

Figure 232a and 232b: The plaster of the central, most active group of figures just above the apex of the triumphal arch was crisscrossed with numerous cracks, almost certainly due to earthquake movements.



Figure 233: St Peter the apostle before treatment with a visible greyish film of dirt.



Figure 234: Condition after the renovation – the difference in the intensity of colours is noticeable.



Figure 235: Condition before treatment – a large area with visible signs of leakage.



Figure 236: Condition after the renovation with removed signs of efflorescences.

FINISHING TOUCHES

After conservation-restoration work was completed on the wall and ceiling paintings of the vault, triumphal arch and western wall, as well as on all profiles, cornices and areas along the windows, the restoration platform was after four years removed. In order to dismantle it, a temporary scaffold was constructed underneath (figure 237). From this scaffold the RC restoration team first removed all unsuitable whitewashes from the surface, which were not accessible earlier due to the work platform (figure 238). In areas where the platform's construction was anchored into the walls the damaged fields had to be filled and the profiles modelled in, the medallions had to be retouched and reconstructed and the profiles had to be prepared for gilding and then gilded (figure 239).

ACCOMPANYING EVENTS

During conservation-restoration work several project presentations were organised on the platform, a press conference for the media at the end (figure 240 – 25 July 2007), as well as several expert and international committees which monitored and oversaw the project (figure 241 – 22 May 2006).



Figure 237: The restoration platform at 13 metres after the removal of the top work surface.



Figure 238: Visible openings into which the anchor ties of the scaffold were inserted and the difference between the cleaned and uncleaned surfaces.



Figure 239: Gilding of the frames on the northern wall of the nave.



Figure 240: Press conference on the platform at work completion.



Figure 241: Members of the international and expert committees during a viewing of the work performed.



Figures 242, 243: Details of the mural in the Palazzo Antonini, Udine (Italy).

CONCLUSION/RESULTS

Numerous researchers of Quaglio's painting have remarked on the changed, dull and non distinct colouring of the wall and ceiling paintings in Ljubljana Cathedral.⁴⁹ This stood out illogically within the time connection of his works before his arrival in Ljubljana (Udine – Palazzo Antonini) and after his departure (Puštal – Chapel of the Holy Cross) and some researches even considered this a change of his style of painting. Why they might have thought so can be explained by looking at and comparing figures 242, 243 (Palazzo Antonini) and figure 247 (Puštal, Chapel of the Holy Cross) where, despite small differences, the continuity of Quaglio's colourful palette can immediately be noted, as well as his sharp shadows and heavy, strong drawing.

Figure 244 show the condition before and during mechanical cleaning during restoration work on the vault of the cathedral (2002-2006). Such a monotonous, flat and at times unreadable appearance of the wall and ceiling paintings justifiably attracted the attention of the connoisseurs of Quaglio's painting oeuvre. An interesting is overly darkened area of Christ's head, which was, probably due the significance of the figure, overzealously cleaned with moisture so that soot and dust were even more thoroughly washed from this region. It is true to say that the surface was cleaned, however, an extremely fine sooty black pigment was rubbed into the porous top layer of the lime plaster.

After the removal of all unoriginal layers using mechanical and chemical cleaning, the handling of various and numerous areas of damage to the colour layer and support, and retouching (figure 245) we can talk about the appearance of the vault that once again resembles the original in terms of light and colour values.

Because of at least one unsuitable cleaning procedure to the vault paintings, as well as numerous tiny fallen off particles of the colour layer and whitewashes, the impact of leakage, and numerous large and small areas of damage in the structure of the plasterwork and construction, it was not possible to totally renovate the condition from three hundred years ago. The scene shown in figure 245 (vault painting, Ljubljana Cathedral) is less contrastive and less colourful than the scene *Descent from the Cross* (Puštal, figure 247), even though both of them may well have

been painted in the same year (1706). The time difference of production between the two is merely a few weeks apart so one would reasonably expect to find negligible discrepancy in the colouring and style of the mural, since the Puštal painting is in effect a continuation of Quaglio's work in the cathedral. The difference in the wealth of colour tones of both murals can be ascribed to the numerous beauty treatments to the cathedral vault paintings which, however, were justified, given their more exposed location and following numerous areas of damage to the support.

We tried to simulate the appearance of Quaglio's mural in the cathedral in 1706 by using digital technology. We added the light and colour values of figure 247 – which is known to also have been painted in autumn 1706, immediately after the completion of work on the vault – to figure 245 from 2006, which displays the state of the renovated wall and ceiling paintings of the vault of Ljubljana Cathedral. The shots of the Puštal wall and ceiling paintings date from 2005.

The painted surfaces found in easily reached spaces are usually subject to more frequent cleaning than those which can be accessed only from high and expensive scaffolds. However, this does not mean that these works of art are better preserved due to more frequent renovations; usually too frequent "cleaning" is more harmful than useful to the frescoes. In the cathedral such a space is certainly the presbytery with four larger, easily reachable paintings, where in places only an inkling of Quaglio's brushstrokes remains underneath numerous overpaints (figure 248). Here much work awaits restorers.

The comparison of three draperies with a similar pattern by artist Giulio Quaglio depicted in 1697/1698 in Udine (Palazzo Antonini, figure 249), 1705/1706 in Ljubljana (cathedral vault, figure 250), and 1706 at Puštal near Škofja Loka (Chapel of the Holy Cross, figure 251) reveal an obviously darkened, smudged grey lining in the regions that had originally been painted using a lighter shade (most obvious in figure 250). On the younger mural (figure 249) no changes or damage can be noted at first. However, the incredibly well preserved wall painting in the Chapel of the Holy Cross at Puštal that was produced straight after the completion of work on Ljubljana Cathedral, upon closer examination, reveals darkened highlights also on this mural, and not only on the drapery, but also on the hair of the female figure (figure 251). Obviously these two paintings received less attention by restorers, whereas it can be said for the one at Puštal that it had not yet been subject to any

⁴⁹ SITAR 2004–2006 a, p. 38 and SITAR 2004–2006 b, p. 35.



Figure 244: Condition before the renovation of the vault painting in Ljubljana Cathedral.



Figure 245: Condition after the renovation.

restoration-conservation treatment. The now darkened, but once yellow parts of the drapery, which were initially assumed to have resulted from the “washing”⁵⁰ of the vault mural, are also the outcome of changes to the pigment used. Investigations on the removed particles of the colour layer have confirmed the chemical changes that have taken place on the yellow pigment.⁵¹ By using a stronger yellow hue, Quaglio tried to achieve the effect of a particularly bright, shining yellowish illumination of certain figures, which he was not able to gain through the use of the earthy yellow ochres. He achieved a similar “shining” effect by using the bright red cinnabar, particularly on the cheeks and lips, however, this pigment too lost its potency through the years and became darker. Besides the use of lead yellow and red, there is a specific use of lead white here, for which masters like Quaglio knew was not advisable in wall painting. Despite that, they sometimes used it in the tempera

⁵⁰ SITAR 2004–2006 a, p. 7, p. 11.

⁵¹ ROPRET 2006.



Figure 246: A simulation of the appearance of Quaglio's vault painting in 1706.

technique with a protein binder, usually egg based,⁵² for the finishing touches to a fresco.

Despite the large number of damaged areas to the surface of the wall and ceiling paintings, there were none that would essentially or overly impinge into the original structure of Quaglio's composition. Even the only major reconstruction of the head of the virtue at the crossing of the quadrants H8, H9 and G8, G9 was performed according to a well preserved black and white photograph, therefore we can talk of minimal restoration treatment in terms of retouching and reconstruction. The used highly reversible binder ensures quick removal, whereas it leaves the original unaltered and therefore more easily accessible to the next generation of restorers.

Along with our primary task to study and renovate the ceiling paintings of Ljubljana Cathedral, we also drew attention to the set of problems in the north-western part of the roofing.

⁵² GIOVANNONI, MATTEINI, MOLES 1990, pp. 21–25.



Figure 247: A detail of Quaglio's wall painting at Puštal.

By comparing the renovated surfaces of the wall and ceiling paintings on the vault, western wall of the nave and in-between accompanying surfaces, which are the result of a restoration-conservation project spanning several years, and other wall and ceiling paintings of Ljubljana Cathedral, the watchful observer can easily discover numerous surfaces which beneath a grey veil hide the original colour hues of Quaglio's painting.⁵³

⁵³ Photographs: Valentin Benedik and Rado Zoubek, IPCHS Restoration Centre. Drawings and illustrations: Rado Zoubek.



Figure 248: A detail of Quaglio's wall painting in the presbytery of Ljubljana cathedral.



Figure 249: A detail of the mural in the Palazzo Antonini, Udine (Italy).



Figure 250: St Nicholas, a detail of the vault painting in Ljubljana Cathedral.



Figure 251: A detail of the wall painting *Descent from the Cross* at Puštal.

The creation of a monumental work of art. The painting of the nave vault

Josip Korošec



The creation of a monumental work of art. The painting of the nave vault

Josip Korošec

KEY WORDS:

wall painting, genesis, method, composition concept, perspective, quadratura, curve, cartoon, light

ABSTRACT

This contribution deals primarily with the progress of the painting in terms of five established steps. These form the methods of monumental wall painting which, together with other artistic and scientific achievements of the Baroque period in the then Ljubljana and the cultural conditions characteristic mainly of Southern and Central Europe, enabled Quaglio to realise on the vault of the cathedral nave his hitherto most artistically accomplished work.

INTRODUCTION AS A JUSTIFICATION

Between 1705 and 1706¹ Giulio Quaglio painted the vault and the higher levels of the southern and northern walls of the nave of the Cathedral of St Nicholas in Ljubljana. This was one of the most extensive and complex tasks involved in the completion of the Cathedral, as it involved painting approximately 545 m² of the vault, incorporating the scenes into the architecturally divided surface in a convincing fashion. For Quaglio and his workshop this was a great test of organisational and execution skills as well as of the strength of artistic expression of the sacral content. In terms of time, the preparation for and execution of the task were a relatively limited process, which can be partially reconstructed with the analysis of the ceiling painting, the preserved material evidence and knowledge of past experience of such projects. In 1999, following an agreement between the Archdiocese, the Restoration Centre and the Ljubljana Regional Institute for the Protection of Cultural Heritage, there arose an opportunity for the genesis of this monumental cathedral painting, which has been successfully fulfilling its function within the physical space of the church, to become the subject of expert treatment. This enabled an insight to be gained into both the practical and theoretical scope of Baroque artistic creativity, an assessment of its presence and influence in the area to which Slovenia belongs, as well as recognition of the mastery of Quaglio, who combined knowledge and skill, supplementing them according to content, thus creating new challenges for his own abilities.

It is restoration practice, with its direct treatment of the substance of heritage, which facilitates findings that most tangibly reveal, or at least partially allow access to, the complex creative processes involved, i.e. the true genesis of a work of art. In this case, it is of interest not only due to its generic but also its genetic characteristics, i.e. qualities created by the prevailing circumstances in contact with inherited skills, conceived of with specific new goals – the subjective and objective goals that give purpose to a certain act, or at least justify it. It is a primary challenge of sorts to achieve findings confirming that which is recognised and within it uncover hitherto undefined, undetermined or even forgotten and for various reasons overlooked characteristics, and it imbues a work of art with a lasting or at least long-term significance, even to a certain extent when its material form has been destroyed.

With regard to the genesis of the work of art, we are of course dealing with a phenomenon that in restoration terms can not be dealt with

from the point of view of the current appearance of a work, in spite of the fact that protection measures are being implemented now. Nor is it possible to deal with it in its subsequent or resulting form with regard only to selected issues, of interest and value only to specific professions. Above all, it is not enough to understand and research only that which happened, but also that which enabled it to happen. The origin of a work of art is a dynamic phenomenon, consisting of a number of interconnected processes in which new characteristics appear that are, with their well-conceived content, subject to specific rules and that make sense due to their apparent purpose. At the same time, attention is drawn to the course of the realisation of an artistic idea, to the prevailing general conditions, the technical preparations involved and the artistic abilities shown in the execution. Moreover, it is a proof of an organic tie to the better defined processes that shaped the cultural consciousness of Baroque Ljubljana, its active co-creation of a high artistic level, as planned by the initiators and organisers of cultural renewal. And finally, the genesis of the work bears witness to the creative orientation of art, to the direction of subsequent development, to the ability of executors to understand those initiatives and influences that are not directly recognisable in the functioning of the painting itself, but which are needed by restoration as a basic starting point for a programme of restoration measures.

To put it simply, an analysis of the origin of the work provides the foundation for its preservation, including its artistic qualities. With the recognition of the processes that have shaped it, its creative qualities become established at the time of restoration, and these undoubtedly surpass the result of the creative act itself and reveal the conditions within which it took place. Restoration also facilitates a more objective assessment of the time and place of the appearance of the work of art and data useful for further expert treatment. Last but not least, restoration also represents a tried and tested way of directly preserving the properties of heritage.

Undoubtedly, a sort of *perpetuum mobile* in art is represented by development, i.e. a series of phenomena and processes that propel and direct it through time, enabling it to survive through experience, establishing itself through results, and with new ideas and shifts become supplemented and altered. In establishing harmony with another culture, such tendencies have always been an important proof of the vitality of a particular style, direction or movement; or when with the dominance of a particular factor or its exclusion they exhibit a gradual narrowing to defined limits, this usually forecasts the decline of a particular period.

Of course, a specific style with an established manner represented a considerable support to an individual artist or group of artists: its subject matter linked inseparably with training and practice, additionally furnished with guild regulations, models, and so on, it guided and ensured a certain level of quality in the creation of works of art. However, the extent to which the expected level was exceeded was a matter of creative initiative in the design stage and of excellence, wit and imagina-

tion in the execution. Having to adapt to the external conditions, such as spatial and architectural ones, especially when the monumental size must match the architectural design and have a strictly defined place and role, increases the complexity of execution. The artist's responsibility for the artistic work, whose purpose is defined in advance, especially if it is planned for secular or sacral public use, is also different. The requirements of the commissioner of a work of art are in this case much stricter and the expectations more precisely defined.

STARTING POINT

The painting of Ljubljana Cathedral was a challenge for Giulio Quaglio, encountering a new urban environment and individuals with yet unproven taste that were acquainted with artistic trends in some leading centres, particularly Rome, but who, in line with available opportunities, were creating a cultural image for the town which showed their ambition and at the same time their conscious responsibility to enable those ideas that change the common into something selectively different to be realised, thus achieving their goal. Particularly exciting is the fact that Quaglio was invited because with the testimonial of his own work² he guaranteed the quality that could replace the unrealised intention of having Andrea Pozzo decorate the new church. The next, no lesser challenge, was created by Quaglio's direct encounter with the work of this established theoretician and respected master of painting and architecture: to the building for which Pozzo had created the final plan, Quaglio had to contribute an equally respected and important part, i.e. paintings that would create inside the church an atmosphere worthy of religious observance, supporting suitable ritual contemplation (figure 1).³ All this had to be in accordance with the principles that the creator of the frescoes in San Ignazio church in Rome had prescribed in his treatise on the future of painting and architecture (*Perspectiva pictorum et architectorum*, Roma 1693).⁴

Combining the instructions and expectations of the commissioner and his circle of colleagues, as well as the opinion of the public, which kept a regular eye on its own interests, together with ideas suggested by the church space itself, as well as the basic organisation and interpretation of individual elements of design into a whole that is in line with the standpoints theoretically advocated by Pozzo, was a uniquely demanding task. Thus Quaglio had to supplement or at least improve the manner and style with which he had established himself in Friuli and Lombardy and on the basis of which he was commissioned in Ljubljana. His personal style was derived from the traditional skills of the Northern Italian *seicento*, combined with the developmental trends and

¹ More precisely after 5 May and before 9 October 1705 and from 11 April until 19 July 1706, in: DOLNIČAR 2003, pp. 153, 155, 156, 159 or 306, 308, 309, 312.

² He was invited by Janez Andrej Coppini and the deputy of the Duke of Carniola Count Frančišek Lanthieri; described in DOLNIČAR 2003, pp. 121, 139 and 293.

³ All computer simulations are by Paola Korošec.

⁴ The importance Pozzo had for Quaglio's task is described in: CANKAR 1920, p. 81.



Figure 1: Geometrical analysis of the vertical architectural composition of the presbytery.

guidelines of superior quality offered by Rome, as well as from practical abilities tested not only as readiness to organise and implement, but also as a creative strength which in the persuasiveness of its expression justified the purpose of the planned project.

Due to the limited timescale and the selected painting method, and following the first attempts at the planned idea derived from the supposed requirements of the commissioners and the original plan or *bozzetto*, Quaglio created a considerable part of the design for his composition at intervals during the winter before he came to Ljubljana. In comparison to his experiences in Friuli, the opportunities provided by the work being done in the new Cathedral of St Nicholas, such as the stucco-work,⁵ dictated a considerably different approach. Thus that which was between individual larger scenes on the ceiling filled with light, much more self-sufficient decoration was replaced by artistic imagination and skill.

⁵ BERGAMINI 2000, pp. 235–245.

The decoration of ceilings was greatly emphasised in the Baroque and deciding on a particular form as well as method of execution was thus a highly responsible act. Following the Renaissance a number of different directions had developed, which can be divided into four distinct groups. The first is characterised by geometric fragmentation of flat surfaces, in particular into *lacunae*, usually with suitably decorated and profiled frames. It was a kind of jigsaw puzzle of ornamentation or pictures, which gradually, employing stucco-work that was often gilded, on the basis of this sculpting element, developed into a second group. Not only the frames, but also the individual parts of the direct composition three-dimensionally supplemented its content, thus more convincingly including the decorated segments into the architecture. The third group is characterised by a shift towards self-sufficient geometricisation, also carried out in a plastic manner, which in an abstract way accompanied and adapted to the given shapes of the surface. The fourth group, using painting methods, created a mighty *trompe-l'oeil*, with which it not only dematerialised the actual ceiling, but within the same space built a new architectural idea, placing within it its own narratives. All this was taking place mainly in Rome, but resonated in other creative centres, thus facilitating examples worthy of imitation, but also demonstrating how broad was the challenge of ceiling painting and how many options it offered.

The course of Quaglio's work was most directly dependent on the preparation, the arrangement of scenes, the transfer of composition, the carrying out of *giornate*, their sequencing and everything else that belonged to this type of execution. The building of the church demanded a gradual approach and facilitated various attempts, extending from oils to wall paintings, each showing scenes mostly taken from the hagiography of St Nicholas. This was the fundamental preparation for the grand finale of two incomplete seasons, more precisely nine months, of the painting of the nave vault.

For this type of composition – Quaglio here led a renewed *bottega*⁶ – extensive and relatively complex skills are required, such that enable a new realisation and at the same time ensuring that what has been created here will be useful elsewhere.

Collective, generally valid skills raised to a high professional level. The culture that Ljubljana held as an example and in which it sought ideas for its own development combined Venetian practice with that

⁶ One student and apprentice was Carlo Carloni; DOLNIČAR 2003 mentions him a number of times, pp. 140, 145, 151, 156 or 293, 298, 303, and the other four students he mentions on p. 145 or 298, as well as CANKAR 1920, p. 80 and BERGAMINI 1994, p. 173, 174, who based his conclusions on Stele's claim that in 1703 there were Slovenian students working there; at the same time we must include in the group the builders, who took care of the plaster and were usually in close contact with the artist, as illustrated by Andrea Pozzo in his treatise (*Perspectiva pictorum et architectorum*, Romae 1693) and also by KOLLER 1990, pp. 293–294.

from Emilia and Lombardy, supplementing it with that originating in Rome. This raised the general public level, as due to the quality of its artistic production, to active research and cultural creativity, theologically ascertained and based on conclusions arrived at by tradition, this approach undoubtedly represented a leading body of expertise during the European Baroque.

Group expertise, i.e. possessed by Quaglio's *bottega*, who were trained for different tasks, and that possessed by the individual contributors as they theoretically or operatively oversaw the execution of the task; these skills were specialist, concentrated and tested in practice and, when needed, supplemented or altered with other possible approaches, as well as adapted directly to the prevailing conditions.

Creative expertise, showing originality of ideas, imaginativeness of composition, accomplishment of execution and quality of content and effect; if originality lay in the effect of the familiarity of the approach within the stylistic framework, the composition expressed the concept of order, formed by individual components organised into a meaningful whole capable of expressing specific content with a tested professional certainty and persuasiveness, which does away with, in the most basic sense, the difference between that which is shown and that which is seen.⁷

An artistic interpretation is an actual expression of both intellectual and visual ideas, however complex, an expression that is comparable to objective reality and at the same time to the established image of any scene, including those created by imagination.

It is precisely the combination of sensual, emotional and intellectual ways of understanding the prescribed content that to the fullest possible extent enables an original approach. The quality of an individual artistic work is judged by how much of an artist's skill and virtuosity have been utilised, plus the approach prescribed by a particular style and reinforced through treatises, proposals and suchlike, as well as offered solutions and other props; at the same time it is important with what sensibility all this is interpolated into an architecturally limited space which, above all from the level of enacted social consciousness, has enriched and ennobled its purpose. And probably, that which signified the personal in the experience of the quality of the created work of art was the possibility that in it, in addition to general admiration and respect for such characteristics, enough incentives and opportunities could be found for the co-creation of special content. The creative presence and involvement of an individual in contact with an existing work of art is undoubtedly the reason why the individual keeps returning to its 'domain', maintaining with it direct or indirect contact and understanding its qualities as real values. In a positive sense it is a kind of pride, which the individual feels not only because through it he or she tests his or her cultural perceptiveness, but also because it ensures that, irrespective of all the dictates of life, he or she independently benefits from

⁷ HRIBAR 1984, p. 271.

the most valued works of art. It seems that it is through this personal experience that the metamorphosis of values into something durable, into something which perhaps better alters their complex characteristics into quality components of the personal experience of 'higher' messages, such as religious understanding in the case of a cathedral, has always taken place.

CONCEPT

As Ljubljana Cathedral is dedicated to St Nicholas from Antique Myra and as the key scenes in the gradually emerging church were already telling stories of him and his miracles, it went without saying that the nave and its largest surface – the vault – would be dedicated to the contextually largest and compositionally most complex wall painting, seen above all as a work of art that would visually and contextually link other artistic messages and direct them towards the final goal. Thus Giulio Quaglio, in line with both the commissioner's brief and the contextual definition, including certain components that such a building needed in order to achieve its purpose, derived his concept from the building itself, the division of space within it and from the harmony between the existing architectural elements.

It is clear that the apotheosis of St Nicholas as the central scene was not unexpected, while its overall concept had to ensure that it was related to similar themes. The painter placed in the centre of the composition the sky with the Holy Trinity, opening on all sides and visible from everywhere. Through the dramatic trial of the Cathedral's patron saint the strength of his personality, connected with the sky, and the merits for which he received special mercy, are shown with artistic eloquence. Thus the visualisation of the idea was in fact the first artistic vision of the nave in its actual state. By showing how painting could benefit the nave, it also ensured that the space would not be just a component of the building's architectural sequence, but also a true *naos*, its contextual as well as physical part, in which the faithful would be able to encounter their convictions in a deeper fashion.

The actual beginning of the realisation of the proposed concept of the painting was the preparation of the composition, which in the creation of the final image also meant its division into technically executable parts. The fundamental guideline for this work was how to realise the adopted idea as a monumental ceiling painting. It was intended to combine the sky and the Holy Trinity with scenes of the massacres of Christians in Myra and with a gallery of apostles whose experience, supported by eloquent attributes, as an assembly of wise ones placed on the very margin of the objective world, persuades the faithful to take the correct, but exceptionally demanding, path to eternity.

In the composition itself it was necessary to combine something that was later in the theory of David Hume once again defined as a

dichotomy – or more precisely as an *a priori* and *a posteriori* difference⁸ – to convincingly show the transition from one quality to another, primarily not as a process that separates them, but one that supplements them and alters them into a de facto whole. For an atmosphere of contemplation it is important that the believer turns from being a passive, potential or accidental observer into a personality actively experiencing the content of the painted scenes, which prove that the phenomena of that which is transitory are just fragments of that which is permanent.

Undoubtedly, Quaglio had already forecast such a spatial vision and distribution of the complex, composite image in the painting of the apparent dome, which he had in 1703, over six weeks, painted where the presbytery, the transept and the nave meet.⁹ The central form of the vault, particularly its summit, strongly motivated Baroque painters irrespective of whether it was actually there or it had to be fictitiously shown. Various experiences, studies and even small models - *modelini*¹⁰ - show that calottes in the summits of vaults were an extensive artistic area. Quaglio tried out in monumental size the general effectiveness of the idea itself and the design concept and at the same time tested public opinion, obtaining an evaluation of the final image of the proposed ceiling painting in the nave. The public's positive response to his artistic interpretation convinced him that the painting in the nave would satisfy both the commissioners and believers.

In the dome, as later in the nave, he showed the same thematic entities and the same relationship between the consecrated and the heavenly. This time, in the part which was supposed to imbue the whole with a realistic nature there were included, due to the shortening of the perspective of the third area, the figures of the Evangelists in four juxtaposed panels, personalities who each in his own way contributed to the written foundations of the teaching of the Christian faith. Thus Quaglio demonstrated in three categories – the dignified, the dramatic and the elevated – true Baroque contrast. The dome was both in its significance and form of great interest to numerous artists. The hemispheric shape is a dominant component, with which individual churches demonstrate their worth externally, while internally it is a symbol of the sky, showing its energy and substance as the actual driving force of the whole universe. It is the shape of a dome that simplifies coming closer to this point of origin. It was from here that in early architecture and Eastern churches Christ Pantocrator asserted the power of the just, confirmed by the (divine) golden colour, the symbol of the light of eternity; as such, it is usually supported by the daylight brought to the central circular or polygonal space by the windows beneath or sometimes by the oculus and later by a lantern.

The dome reaches far back into history as its shape allows man to successfully enter space. During the Roman Empire it became a compo-

nent of buildings (baths, palaces and villas) or an independent element. A synthesis of all the relevant knowledge was probably expressed in the Pantheon, a building from the time of Hadrian the purpose of which was later changed from an Antique temple to a Catholic church: in the 17th century Bernini added the two bell towers, thus emphasising its function externally. The Pantheon was once a source of findings that later contributed to the appearance of such important achievements as Brunelleschi's dome in the Santa Maria del Fiore church in Florence. The architect realised his project only after extensive study in Rome, to where he travelled twice for this purpose.¹¹ Perhaps this is why the characteristics of the Pantheon were one of the key issues dealt with by theoreticians such as Alberti and Palladio.

Judging by Langus's copy dating from 1843 – due to the final construction of this part of the church Quaglio's "falsa dome"¹² was removed – the then composition was designed spherically and in its apex concluded with a relatively large oculus (figure 2a).¹³ Thus the dome represented the shape of the universe, in the cosmic dimension of which it was contained. Through the round open window, surrounded by a balustrade, it looks at the very heart of the sky and Mary's crowning which, rendered in a special perspective that is different to that of the lower scenes and surrounded with an assembly of angels, glows with a special light. Together with the light from the imagined windows it changes the architecture of the interior of the dome into a space that is emphasised by colour. A possible transition from the lower space to the higher is indicated by the figure of St Nicholas, who is positioned in the geometrical centre of the entire composition.

Rather than the construction of the dome, so expressively designed by Pozzo in the church of St Ignatius, which shows a strong influence of the popular Pantheon and Renaissance architecture (figure 2b), Quaglio's painting followed the positioning of individual horizontally designed wholes, united into a vertical axis, and a very lyrically conceived colour contrast, i.e. the Baroque method of incorporating content into a lively dramatic unit.

Pozzo's only architecturally designed dome is supplemented by a lantern, while on Quaglio's painting, as in Mantegna's in the Camera degli Sposi in the Palazzo Ducale in Mantova, there is only the oculus surrounded by a balustrade¹⁴ and looking directly at the golden yellow or, in the Renaissance example, the blue sky (figure 2c). Giacomo Torelli, one of the best theatre set designers, created a similar scene, surrounded by garlands, for the performance of *The Jealous Venus* in Venice

¹¹ VASARI 1822, pp. 161–175.

¹² Langus's copy is kept at the Ursuline monastery in Ljubljana and the preserved fragments of Quaglio's painting at the National Museum in Ljubljana.

¹³ All drawings are by Josip Korošec.

¹⁴ Quaglio painted a related painting in 1700 on the vault of the former church of Saint Francis della Vigna in Udine and continued to develop the direction he had started with his painting from 1696 – *The Assumption* – for the chapel of Monte di Pietà; CANKAR 1920, p. 136 and 137.

⁸ HUME 1974, pp. 73–79.

⁹ He is thought to have acquired such fundamental skills from Guercino: CANKAR 1920, p. 132.

¹⁰ KEMP 1990, p. 43 and 73.



Figure 2: Compositional characteristics of the false cupola; a) G. Quaglio, an analysis of the former painting in Ljubljana Cathedral; b) A. Pozzo, an analysis of the painting San Ignazio in Rome; c) A. Mantegna, an analysis of the ceiling in the *Camera degli sposi* in Mantova.

in 1643.¹⁵ The two examples differ not only in colour and content, but also in the location of the oculus. Mantegna painted his exactly in the middle of the square vault¹⁶ as an independent composition; in Quaglio's painting, on the other hand, as with Pozzo's, the lantern is moved to the very edge of the painting circle in the direction of the nave. Both give the illusion of a light window; however, the one in Ljubljana is coloured and with regard to content tied to the highest, central part of the nave vault, just as the lower bands are present in both. The false dome in Rome is just an illusionist illustration of the inside of the yet unbuilt part of the architectural form, while the Ljubljana example gives the impression of being two parts of the same motif. Thus, it not only elevates the space but also provides one of the key scenes, the conical composition which has its summit in the centre of the oculus. It is emphasised by a sphere as a symbolic presentation of the Creator's acts and the crowning of Mary takes place in relation to this. In terms

¹⁵ It is now kept in the Museo Malatestiano in Fano.

¹⁶ With its roundness it was able to illustrate the very top of the dome.

of profile, the scene is supported by the construction, consisting of circular and triangular shapes, and the perspective used allows most of the action to be placed in the summit of the dome. The shifting of the oculus allowed for the scene on the vault to be clearly visible from the nave, while from the presbytery it was possible to observe mainly the circular window that continued into the centre of the large composition. The theoretically created reconstruction thus matches in its exterior that on the picture from the Cathedral's presbytery, showing St Nicholas miraculously rescuing the condemned inhabitants of Myra. These two examples show the conceptual difference between the two paintings, related to the difference of the decoration in the naves of the church of St Ignatius and Ljubljana Cathedral. If Pozzo, using convincing methods, endeavoured to show an architecturally elaborated and divided space, Quaglio gained from individual components, so that he was able to organise the three parts of the planned composition into a meaningful whole, without going beyond the significance of the stories he had painted.

Undoubtedly the success of the imaginary dome was of exceptional importance to Quaglio.¹⁷ He attempted it again in the decoration of the vault, announcing a monumental solution to the challenge of the nave, an envisaged compositional connection between all three thematic elements,¹⁸ the colours to be employed and the different perspective of the painting¹⁹ as such. It is clear that the public recognition and praise served as an incentive for the continuation of his work, as well as an artistic obligation to follow his idea consistently.

Thus it is quite possible that Quaglio, as he did in the case of the Seminary Library in 1720, prepared his concept of the painting in the nave vault as a *bozzetto*.²⁰ Bergamini, the author of a monograph about Quaglio, claims that this was the actual starting point for the creation of the final work, as shown by the composition, the arrangement of figures²¹ and the colour harmony. Quaglio needed a picture of small dimensions containing all the key elements of the final image in order to be able to draw up a plan, including all the stages for the realisation of his idea – one reason being that he wanted to complete this demanding task in one year. Like Luca Giordano and Pietro da Cortona before him, Quaglio belonged among the masters whose characteristic was *“fa presto”*, which meant that before the fast, virtuoso final implementation²² thorough preparation was carried out, which in the public mind did not count as part of the implementation. It was often a part of an artist's private activity that gave his creativity a hint of the mysterious and unique. It is very likely that Quaglio kept the basic material for his approach in Laino.

THE PREPARATION OF THE COMPOSITION

If composition is to be understood as a consequence of the process of the creation of the painting field, onto which the entire complexity of the concept has to be transferred and adapted to the characteristics of the surface, then this task presented Giulio Quaglio with an opportunity to exceed expectations and express the whole potency of his creativity. In view of the highly ambitious level of artistic expression, supported

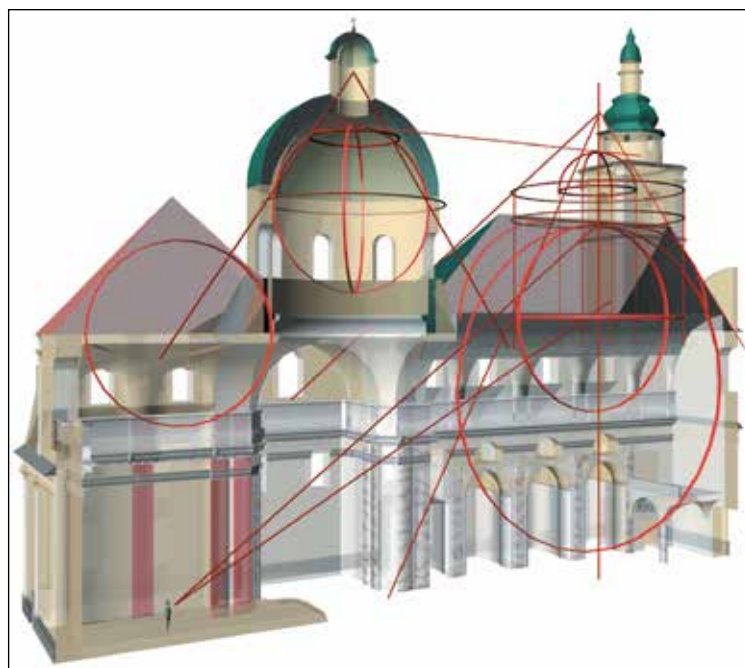


Figure 3: Graphic section of the spatial dimension of Quaglio's composition.

by appurtenance to tradition constantly complemented by the results of intensive research, it was important to persistently go beyond craft and to achieve artistic quality. In spite of the great demands imposed by such an ambitious goal, it was the obvious creative potency that dominated rather than ambition and pride; he was undoubtedly driven by a sense of urgency, a feeling that he was capable of more than he had been offered by the opportunities he had hitherto enjoyed. The realisation that on a limited surface he had to convincingly combine the spirit of the old Nicene Creed with the decrees of the Council of Trent and Bologna²³ was both a challenge and a responsibility. Thus both the councils were temporal milestones as well as measures eagerly defending precisely defined Christian principles.

The ceiling of the nave of Ljubljana Cathedral, consisting of a pronounced semi-circular vault, divided by the triangles of lunettes, is surrounded in the east by a profiled arch and at the other end the mighty tympanum of the western wall, while on the south and east sides it joins the bearing walls of the *naos*. Only the longitudinal central part, with its uninterrupted surface, facilitated the creation of the whole scene, allowing suitable preparation for its realisation. An important basic element here is the space offered by the nave that was incorporated into the artistic composition and became a part of the painting field as a consequence of the observer's visual perception (figure 3).

With an analysis of the spatial placement of the painting on the vault with the use of conical profiles, the theory of which had been provided by Apollonius of Perga²⁴ (figure 4b), it is clear that Quaglio did not define the starting point of the new imaginary space on the nave vault as

¹⁷ DOLNIČAR 2003 wrote about this, pp. 143, 144 and 296, 297, also CANKAR 1920, p. 80, and BERGAMINI 1994, p. 174; in addition, Quaglio's later works, such as the *bozzetto* for the ceiling of St Joseph's church in Laino from 1717 (nowadays in the private Mauro collection), mentioned by BERGAMINI 2006, pp. 197–200, show similarities with the Ljubljana painting; moreover, the consequences of its influence can also be observed in the case of Quaglio's colleague, a member of his *bottega*, Carlo Carloni on his depiction of the *Glorification of the Cross* from 1718 (now in the Indianapolis Museum of Art).

¹⁸ This is a difference and a new feature in comparison to his last painting of the vault in the former parish church of St Hilarius and Tatian.

¹⁹ There is no longer a division into individual scenes, bordered with relatively simple stucco-work frames, such as in the cathedral presbytery, or luxurious frames decorating his paintings in the buildings in Udine and elsewhere, connecting the scenes shown into a kind of representative polyptych.

²⁰ It is now kept in the Casa Quaglio in Laino.

²¹ BERGAMINI 2006, p. 197.

²² BERGAMINI 1994, p. 184.

²³ The first council assembly in Nicene in Asia Minor in 325 was attended by St Nicholas, while the last Council of Trent, lasting eighteen years from 1545 to 1563, took place in Northern Italy, the home of Quaglio, and finished five years before his birth.

²⁴ Born 262 BC in Perga in Pamphylia and died in 190 BC in Alexandria; his work *Apollonii Pergasi conicorum Lib. VIII* was in 1710 published by Halley.

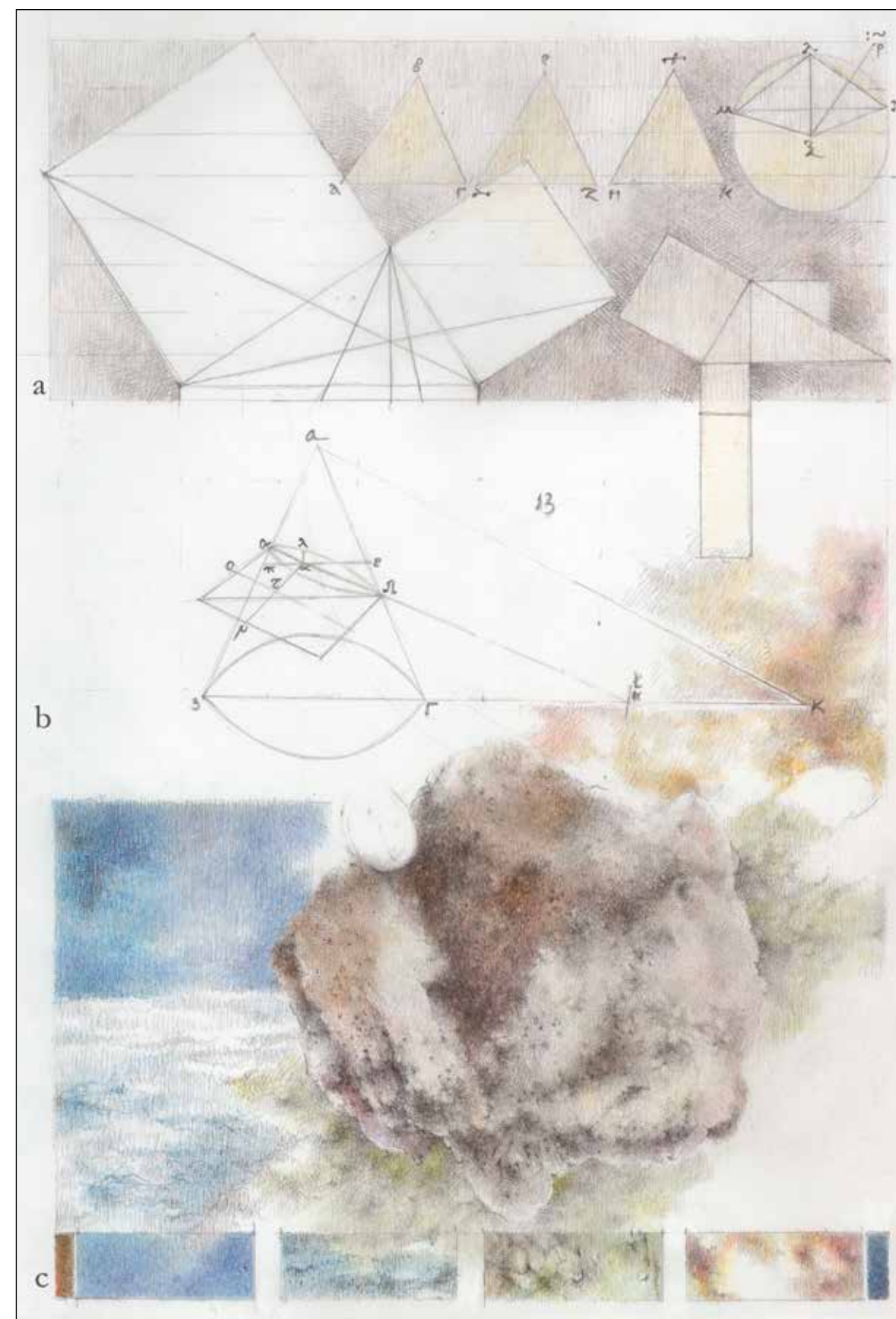


Figure 4: Findings in geometry and natural science in Antiquity, the theoretical foundation of Baroque art; a) Euclid of Alexandria; b) Apollonius of Perga; c) Empedocles of Acragas.

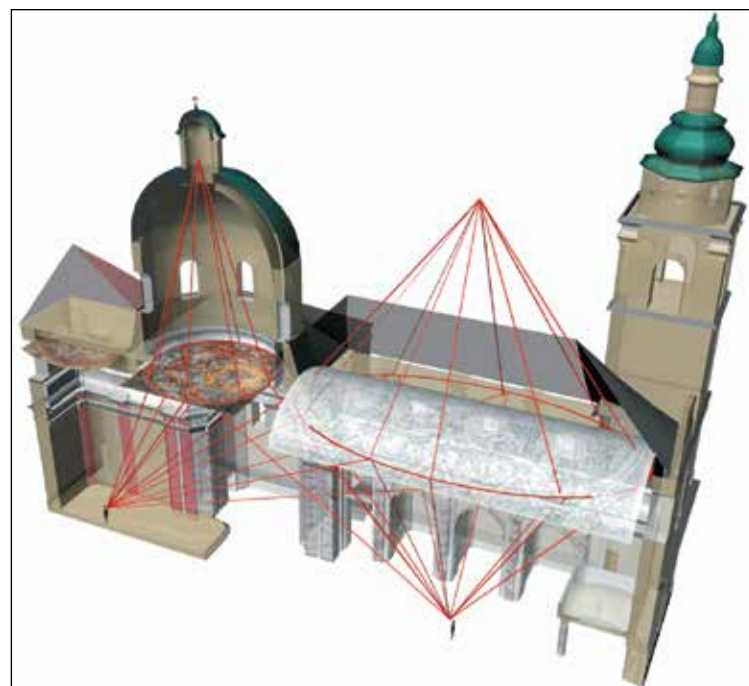


Figure 5: The angles of the observed surfaces of the ceilings united into conical forms.

the meeting point of its diagonals, just as previously he had not painted the oculus in the centre of the circle of the dome. He moved it slightly towards the transept and the presbytery; thus the new axis connecting this point vertically with the horizontally arranged components into a whole became a characteristic and even a special feature of this space (figure 5). Or to use a metaphor: it is an axis, which through the use of perspective, as in weaving, links the selected and interpreted stories into something which in its visual dimension constantly enables one's own, but also guaranteed, path to heaven, or as Plato put it, into a "moving image of eternity" (Timaeus 37 d).

The bridging of the vertically shown distance with real scenes that were ideally conceived, reconstructed according to oral tradition, and located in the vault and the highest parts of the walls, was designed in three stages, i.e. three vertically connected wholes. The dividing line between them is formed by three pronouncedly profiled frames (figure 6). Each one is slightly different in its geometry and the way it is decorated: the first consists of a rectangle and two semi-circles in the nave axis running east to west, the second is just a rectangle and the third, the tallest, is similar to the first, the only difference being that here the longer sides are curved inwards. They are basically formed in the same arch as the architectural supports below, the only difference being that those serve as supports and represent open arches looking at the expanse of the universe, at the open space seemingly surrounding the painted events. The frames were undoubtedly shaped in the spirit of the still valid Euclidian geometry, the applicability of the definitions, postulates and proposals of which was later collected in the book *Elements*,²⁵ a valuable work and part of artistic practice (figure 4a). Thus the shape of the vault contributed towards the liveliness of the rectangular frames: thanks to it, the shorter sides look as if they are slightly curved, depending on the angle from

which they are viewed. Moreover, the orthogonal nature of the frames is most pronounced in the key points, created mainly by the corners in which the sides meet.

The moving of the starting point of viewing and painting of the ceiling painting towards the presbytery could be a consequence of a less consistent and more intuitive use of the established use of *quadratura* and organisation of the composition and with it, linear perspective. It is more likely that the concept of the space itself, the shape and architectural detail of which offered in a simple way its own illusionary image, was for Quaglio too complete and, in view of the already carried out painting elsewhere in the church, less suitable for improvisation. The general inclination towards dynamic, but less narrative and specially selected scenes that needed to be built into the existing features of the vault and the walls, dictated a different, more visible rhythm, which the composition then followed.

As a worshipper could, because of certain rules of movement and the general religious purpose, be positioned inside the church at different observation points, and thus become and actual witness to imaginary events,²⁶ Quaglio made use of his set designing talents. At that time the popularity of and respect for the stage arts in Europe were still growing. Not only literature and music, but also architecture, the visual arts and artistic crafts developed appropriate areas within their activities, thus contributing towards the changing of some aspects of real life into drama. Thanks to art and science, the dividing line separating the fictitious from the real was disappearing.²⁷ The opportunities offered by the theatre seemed boundless and the Baroque used them to its advantage; and Italy, including the area of Venetian influence, contributed greatly to this. In addition to actors, singers and instrumentalists, a number of artists worked in set design and the indispensable technical features and special effects, such as *coup du théâtre*. These, together with interspersed single-act plays and other witty ideas, became the key guarantors of the success of performances, which due to boring, long-winded and insufficiently elaborated plots, frequently needed considerable help. The end of theatre as an art aimed solely at the privileged social classes, its internationalisation and the possibility of showing sacral content, all contributed to demands for qualities that sometimes went beyond the artistic capabilities of those cultural centres that provided the repertoire of the ever growing number of theatres around Europe.

Undoubtedly, stage art had a strong influence on the everyday audio and visual perception of the time and consequently also on life processes themselves, as well as on the interpretation of various phenomena. Without stage art, the image of the world in the eyes of the individual and the community would be considerably different, undoubtedly less encouraging, mysterious and, above all, triviality would be too obvious. New discoveries and their first results led to a belief in the actual power of the

²⁵ This was an interesting book that was translated a number of times after the Renaissance from Arabic and Greek into European languages popular at the time.

²⁶ GOMBRICH 1984, p. 143.

²⁷ MOLINARI 1982, p. 151.

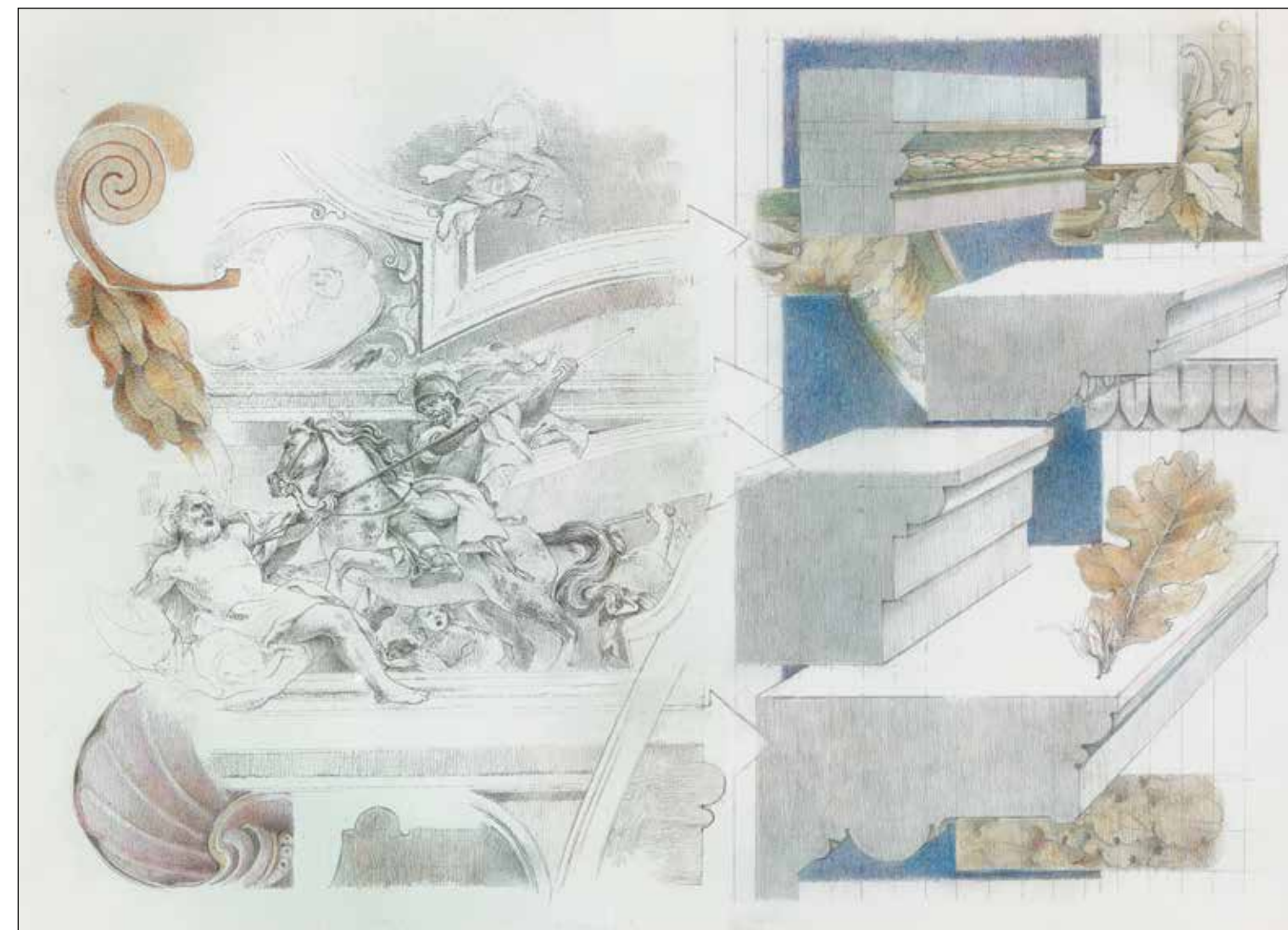


Figure 6: Three-dimensional illustration of the painted frames.

human mind and greater confidence; science, art and religion transferred these discoveries into reality, thus contributing to their transformation into *joie de vivre* and its results. Quaglio's concern for worshippers was expressed roughly in the following spirit: to give them an opportunity to see the personality of St Nicholas in a way offered by the prevailing cultural state of affairs.

These views are the same as those advocated and developed by the Jesuit order in the theatre²⁸ and other arts. The actual execution of the decoration of the church that was built following the model of the Roman Il Gesù and the direct presence of the architectural and painting theoretician and innovator in the art of stage setting, the Jesuit Andrea Pozzo (figure 7b), are the facts that guided and supported Quaglio in his work. They allowed him, like an opera singer, to realise his *da capo*. Being recognised as an original artist ensured him respect from the Ljubljana general public, from his *bottega* and for his teaching work in Laino. But even more than this, it guaranteed him the freedom of expression that is so essential in any creative work.

The reason for Quaglio's interest in set design as an active art form was, in addition to the dictates of content, style and theory, the activities in which his family was involved. His uncle Giulio Quaglio senior was a respected set designer, serving even at the very demanding Viennese court; he reached the summit of his international success with the granting of an Austro-Hungarian aristocratic title.²⁹ In addition to the fame of other Italian masters in theatre architecture and set design, there was also particular reverence for, among others, Burnacini, Sabbatini, Torelli and the members of the Galli Bibiena family. Their contribution to the development of stage art in Vienna, Prague and elsewhere was seen as exceptional. It helped provide theatre with the opportunity to become more widespread and a part of the everyday world. Without doubt, a noticeably different evolution of understanding and seeing, simultaneousness and co-dependence, the objective and the imaginary would have taken place without it.

The general cultural inclination and the support of the Church for the use of theatrical effects, his family's tradition and professional endeavours

²⁸ GREGOR 1933, pp. 379–391.

²⁹ CANKAR 1920, p. 78.

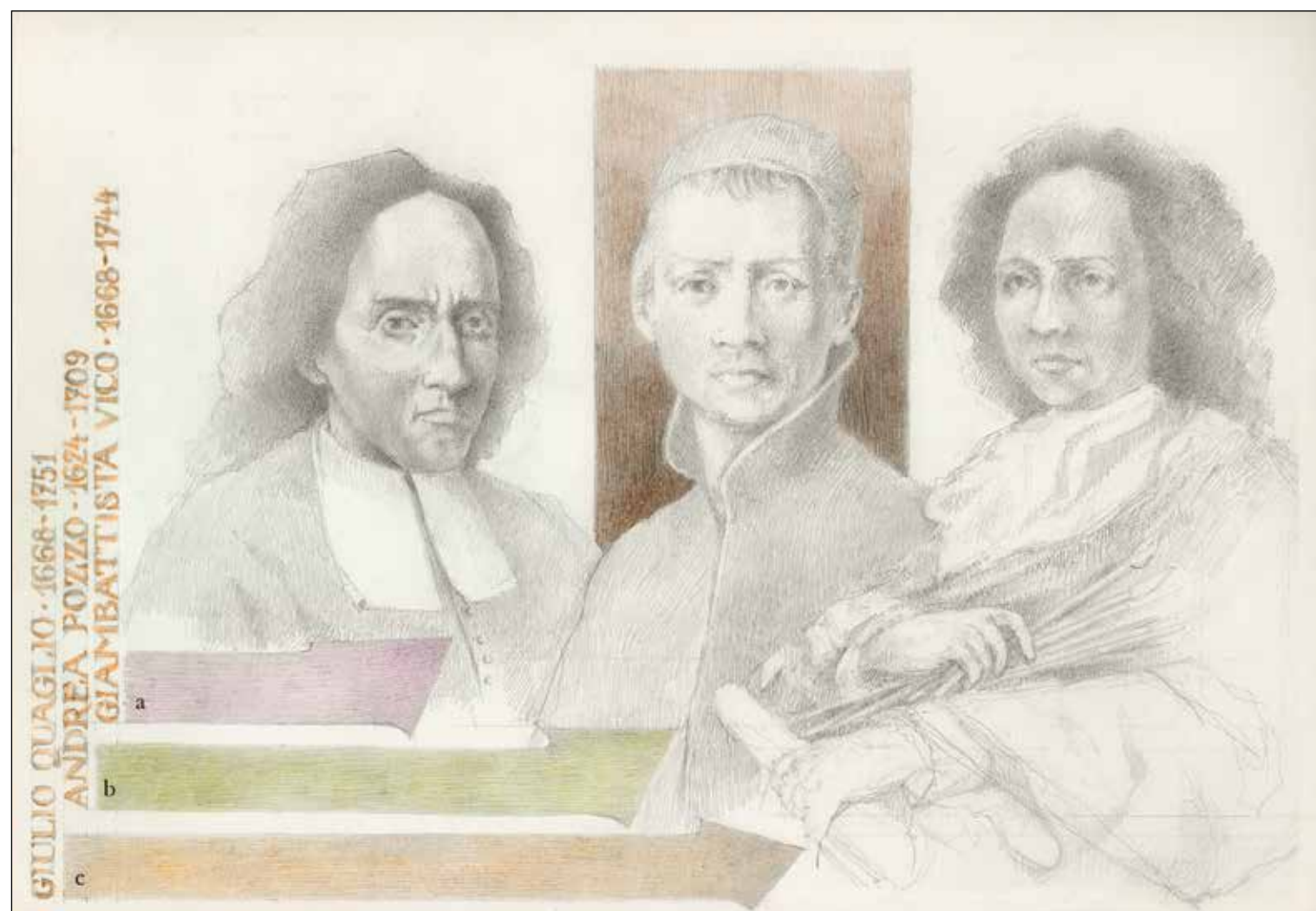


Figure 7: Individuals who made a key contribution towards the appearance and the understanding of the painting: a) Giambattista Vico; b) Andrea Pozzo; c) Giulio Quaglio.

that facilitated and guided such an orientation in architecture and visual art are the factors confirming that Quaglio's shifting of the vertical axis and the angle of viewing the existing paintings was deliberate. In this way he hinted at the fact that the whole of the church space is directed towards the altar and invited spectators towards a more dynamic perception of the church's components, which also suited his planning of the scenes painted on the nave vault.

The shifting of the axis was, of course, aimed at the viewer who was also a worshipper, who required a specific atmosphere for deep spiritual thought, for participating in rituals, carrying out the prescribed tasks of his religious appurtenance and the recognition of acts to which the church and its parts are dedicated. With regard to visual art, it signifies the intention that the paintings in the areas of the nave bordered by individual architectural details be linked to other paintings in other parts of the church, with the presbytery arch and the false dome, thus illustrating their thematic integrity and the causal links among the chosen images, and in this way, in a sense, intensifying their content (figure 8). The accu-

mulated skill and knowledge on which Quaglio's artistic practice, either consciously or spontaneously, was based was growing³⁰ and thus it was an interesting challenge to surpass the already achieved thematic quality in monumental art.

The analysis of the construction of the composition of the ceiling painting shows that it was highly premeditated. The planning of the geometry of the painting, in which persons and stories were arranged in a circular principle, transcended the rectangular nature of the ceiling, thus connecting with the form of the painted dome, hinting at harmony with the shape of the universe (figure 9a). In accordance with this the vertical construction seemingly increased the height of the nave, so that it could better match, albeit only in imagination, the expanse outside, to which it *de facto* belonged. Together with the triangle and the rectangle, i.e. the chosen geometrical shapes, Quaglio created three-dimensional

³⁰ The result of this is also the greater thematic and formal quality of the painting on the nave vault, as noted by CANKAR 1920, p. 188–190 and BERGAMINI 1994, pp. 184–185.

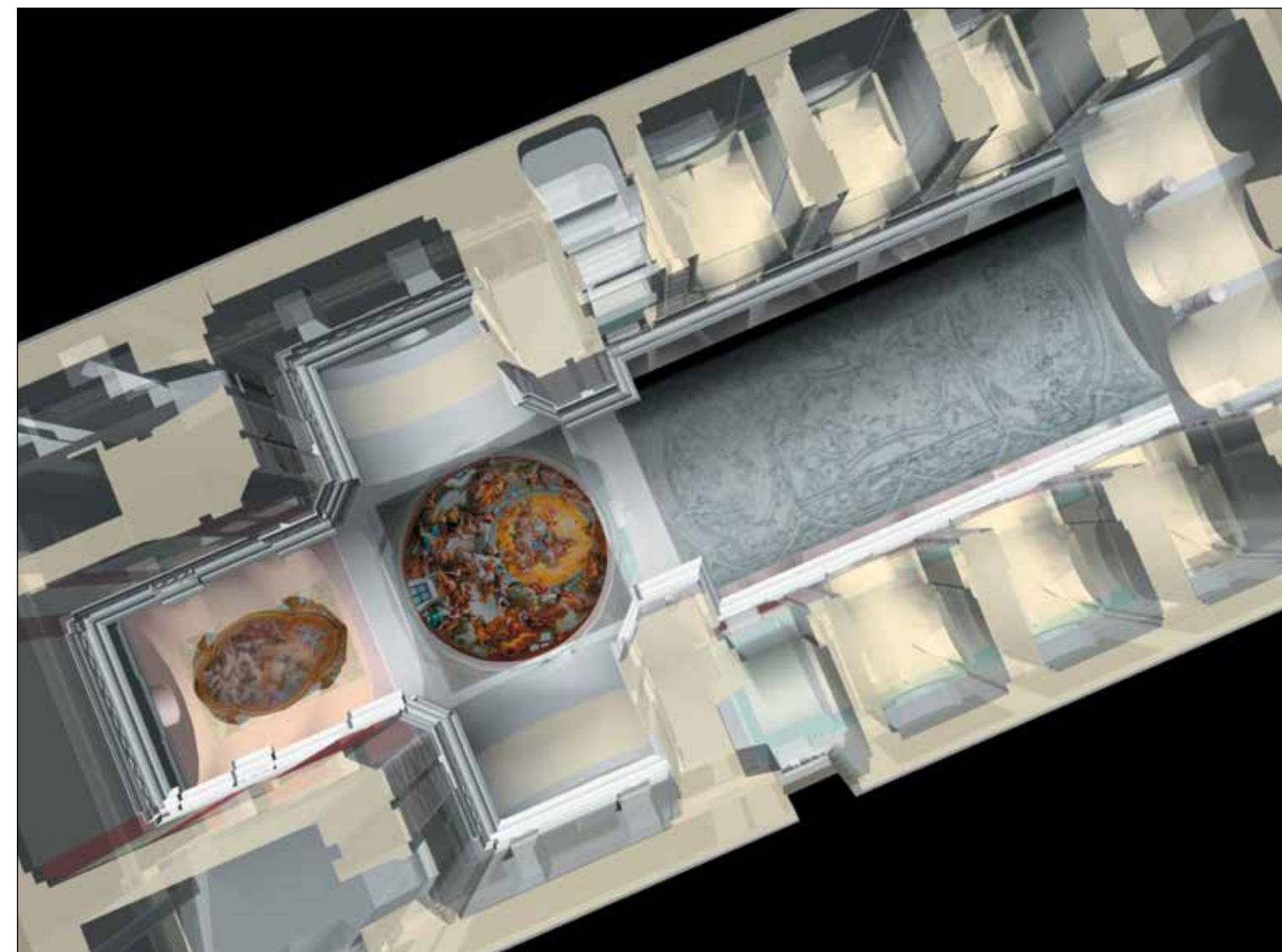


Figure 8: A compositional link between the painting on the ceiling of the presbytery and the false dome with that in the nave vault.

space in all its symbolism³¹ and realistic persuasiveness. With this understanding and knowledge he even assisted in the creation of the church bell towers.³² The precision and, in a sense, severity of the planning are shown more in the concept of the composition than in the final appearance of the painting. It is interesting that in the execution he created a strong base and the strongest idea with regard to the use of space with the horizontally directed, richly profiled and harmoniously coloured frames. The rest of the relatively simplified architecture he showed in the middle section more as pastel walls and as a background to more pronounced figural representations.

Quaglio's task was the decoration of the vault and the upper section of the nave walls, the pronounced arch of which was divided by ten triangular lunettes, and windows beneath each of them, plus an additional one in the middle of the western wall, finished in a semi-circle. His presence during and cooperation in the building and finishing work gave

him an insight into the size and shape of the surfaces that needed to be painted. With regard to the ground plan, the nave consists of just over two squares. It was this surplus that enabled Quaglio not to follow the strict mathematical rule, but to determine the centre according to the way the place was built and the two central lunettes. The surface, the framework of which is intended to be supported by the tops of six lunettes, he dedicated to the sky, the central part of his composition, and to the intermediate area, a kind of border with a frieze depicting the slaughter of Christians in Myra in Lycia. Geometrically, the square was the central part, and two squares of the same size that were derived from it and shared it, formed with their edges the second frame that is now rectangular. In order for them not to overlap with the larger frame, he showed the longer sides as arches, while the shorter sides were divided by semi-circular elements, thus showing the longitudinal direction of the squares positioned on the axis and bringing the whole they form closer to an oval shape. The diagonals of the rectangular shapes on the inside created the composition's triangles and a visible pyramid, which in its

³¹ KURENT 2002, p. 109.

³² LAVRIČ 2003 a, p. 56; PRELOVŠEK 1998, p. 156.

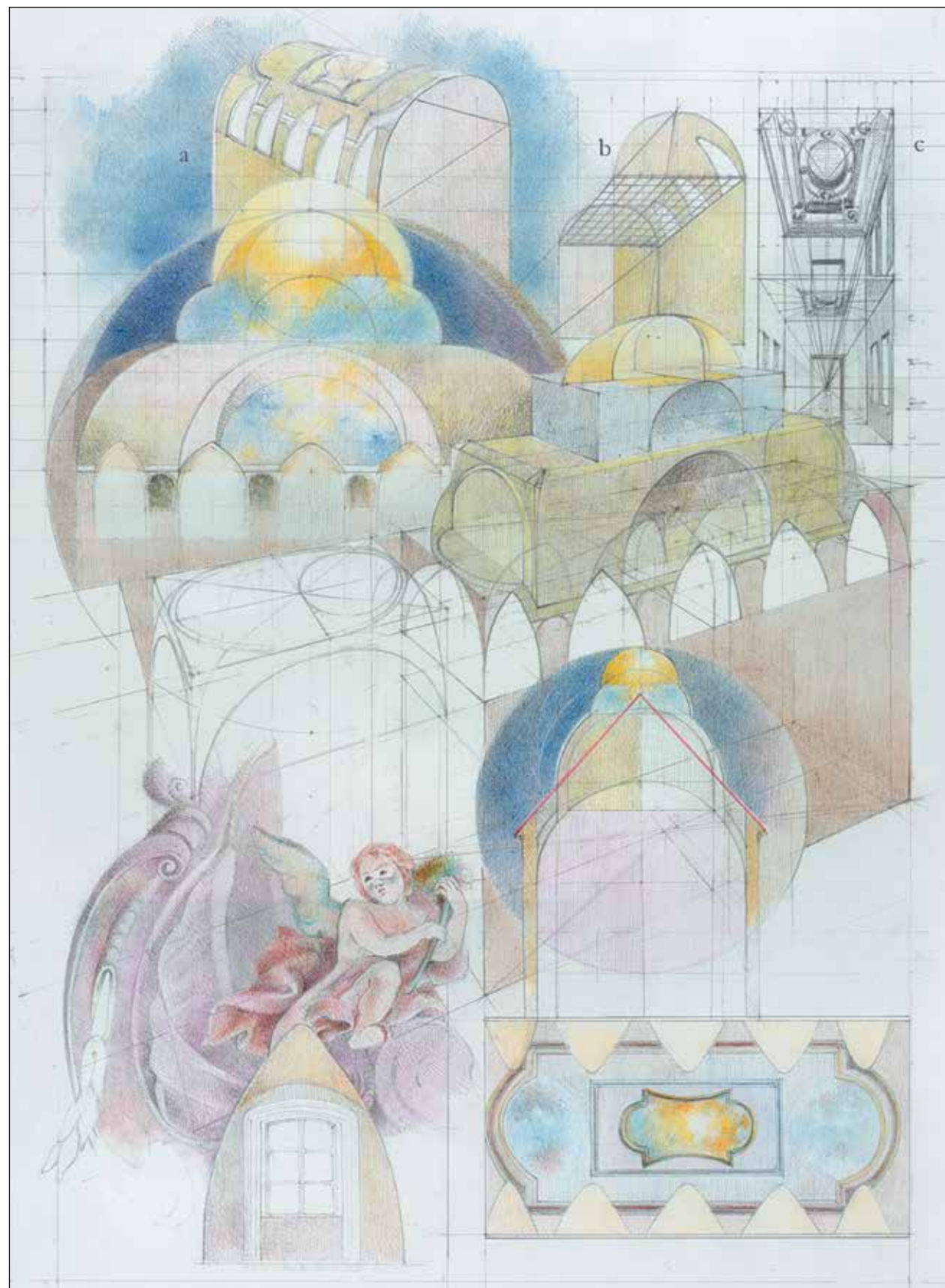


Figure 9: Architectural starting point and imaginary design of the composition: a) Quaglio in the Cathedral of St Nicholas; b) Pozzo's quadratura; c) the transfer of construction according to Gallo da Bibiena.

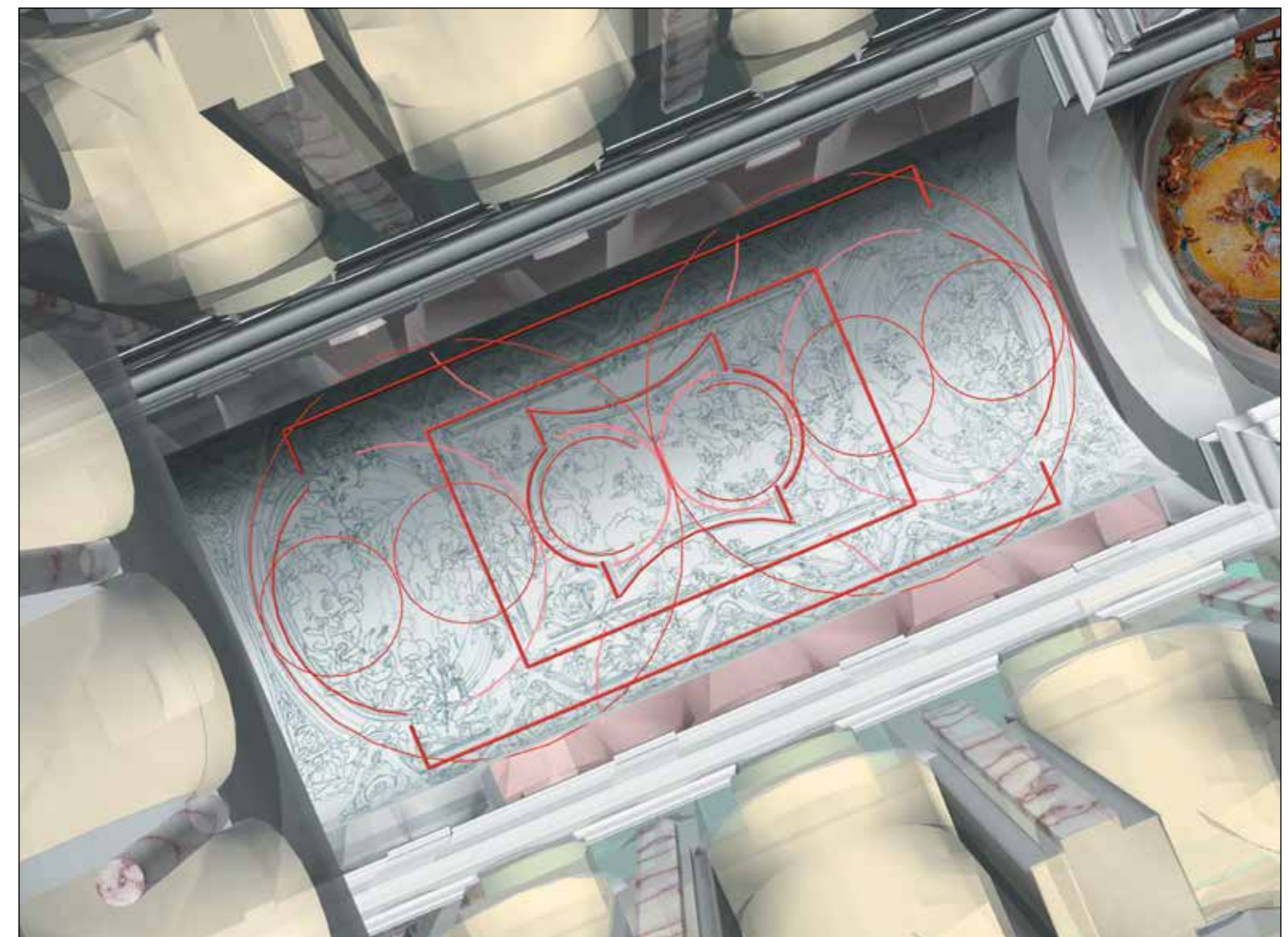


Figure 10: The geometrical design of the organisation of the motifs in the nave vault.

summit joined the axes of the perspective. The size of the planned figures provided the apparent height of the space in which the intended story was to surround the central part of the vault, creating a feeling that it was happening somewhere between the sky and the arched openings in the walls and the Earth, i.e. the lower part of the nave (figure 10).

The composition clearly includes the figures of virtue, taken from the respected manual *Iconologia* by Cesare Ripa,³³ an author who at the decline of the Renaissance collected together the symbols representing numerous activities, i.e. "everything that can happen in human imagination", as he said in the introduction to the third edition of his book.³⁴ In general, the illustration of the positive and negative human characteristics, of course equipped with the established attributes, excited the imagination of individuals from various professions, including Leonardo, who is thought to have prepared but never completed a *Libro titolato da figura umana*. It is

important that Ripa's manual offered merely descriptions; thus his words had to be visualised, offering the skilled painter freedom of expression.

Quaglio paid particular attention to these symbols, in addition to the prophets and sibyls; he painted them in what seems like monochrome so that they give the impression of being sculptures, round stone plastics and bronze reliefs (figure 11). Placed in the architecture as decorative elements, supports for individual elements or as independent sculptures, they show the full scope of this art form. To copy this well meant that Quaglio was more than familiar with this particular art. His recent, intense cooperation with stuccoworkers from Lombardy,³⁵ in addition to his natural talent, gave him the knowledge to understand not just its role in the space, i.e. the dimension of volume and the type of material used that he interpreted in a monumental form, but also the methods of its creation and the use of a specific type with respect to its intended function: round plastics in the centre of activity and refined golden relief somewhere on its intimate edges.

³³ Initially, *L'Iconologia* was published without pictorial material in 1593 in Rome; the next edition in 1603, again published in Rome, included illustrations by Cavaliero d'Arpino.

³⁴ "tutto quello, che può cadere in pensiero humano".

³⁵ BERGAMINI 2000, pp. 235–245.

In the functional space of Baroque acroterions and caryatids, additionally enriched with cameo-like applications, the monochrome figures belong more to the abstractly designed architecturally constructed borders of imaginary spaces. In painting, these elements had appeared earlier as a means of proving expressive abilities, with which any ideas and themes that altered the unknown and the uncertain into a tangible truth. As noted by Bergamini,³⁶ Quaglio had already successfully attempted this kind of expression, for example in Palazzo della Porta in Udine.

Thus three frames, together with the existing architectural details, signified the basis of the tectonics of the composition, and the shift of the vertical axis an intentional rather than accidental alteration of the geometrical centre of the painting, as it was from a point in its lower part that the viewer's perception began. The size of individual shapes within the thus designed space was possible to determine by taking into account the shortening and reducing of figures in line with the dictates of perspective. The apostles are arranged in false alcoves between the windows and their lunettes; in spite of the prevailing conditions and symbolical meaning they are in an appropriate relation to the other figures in the scene, who are of course shown equally, in accordance with the role of the group to which they belonged. Even according to Norberg Schulz³⁷ the question of space in a composition can be defined in a slightly different sequence, where the initially pragmatic and existential space would be followed by the perceptual and finally the cognitive one, in which the physical properties combine with the abstract ones into perfectly logical relationships. In Heaven, the most remote space, the size of figures was derived from Quaglio's previous experience of painting monumental compositions, such as the painting of the ceiling in the church in Gorizia. As its creation was relatively recent (1702), Quaglio could use it to come up with useful solutions to the challenges appearing in the central part of the vault in Ljubljana. The main characters of the dramatic events in Myra belonged to the central part of the whole scene not just with regard to space but also their scope. This facilitated the drawing up of the plans for the frames for the architectural projection onto the nave vault as well as the cartoons for the transferral of the drawings of the apostles and other figures belonging to this scene onto the fresh plaster. It is quite possible that Quaglio prepared at least those for the key parts of the central composition in Laino, where he intended to finish the entire picture in one year. In spite of this it is not quite certain whether the military conflicts between the French and the Germans, due to which he in 1706 returned to Ljubljana via Bologna, helped to intensify the scene of the massacre of the Christians.³⁸

The profile and recognisability of the activities of an individual artist and his *bottega* in the culturally highly developed central and eastern areas of Northern Italy depended on the artist's abilities, creative openness and continuous use of improved knowledge and research findings;

motivated in every possible way, these complied with demanding expectations, surpassing them in innovative ways, thus changing into a driving force, which was in many ways the leading one. Thus the creation of a work of art that had a public purpose was the consequence of emotional and intellectual striving, through which various norms and methods established themselves and the foundations for new theses and professional norms of future development became clearer. Perspective was thus bound to be an area of wider scientific and artistic endeavours.

In the Renaissance, the quality of an artist was measured by his skill and the creative ways in which he utilised it. The construction of a composition and the organisation of the space and time of the illustrated scene were based on this skill, while in the Baroque it was used to combine real and imaginary elements into a new objective whole, the individual or user becoming a part of the value thus established. This is why interest in painting perspective and in the use and treatment of the findings of respectable Renaissance and Mannerist theorists and practitioners continued into the 17th and 18th centuries, and was built upon with publicly presented innovations in treatises, manuals and learning material that dictated the construction of tools and an array of methods for the execution of the planned tasks.

In the Emilia and Venezia regions, in particular in Venice, Bologna, Padua and Parma, there was a great deal of interest in these issues, which signified not only a possible dimension of artistic expression, but also the general level of the understanding of space. As a result, commissioners and the public expected suitable skills in the realisation of architectural projects and paintings. Artists thus had to satisfy the general view on and comprehension of space, what goes on in it and perhaps even enrich it with virtuoso approaches and surprises.

In addition to space, its dimensions and components were also the subject of further exploration and more modern treatment.³⁹ These called for new findings about the conclusions reached and assessment of the results achieved, which were an interesting starting point for further studies. Under the mentorship of respected families, such as the Barberinis, and in the interpretation of key intellectual figures, Rome, Florence and Bologna united and developed further knowledge. Thus the theoretician Matteo Zaccoloni from Cesena became established with the help of Casiano dal Pozzo and his four treatises,⁴⁰ in the manuscripts of which he dealt with perspective, colour and shading, combining the findings of a number of theoreticians from the past, in particular Leonardo's highly regarded and oft copied *Trattato della Pittura*, which influenced a wide circle of leading Baroque artists.⁴¹

³⁹ Some of the proponents who ensured the theoretical and practical establishment of Renaissance achievements included Tommaso Laureti, Romano Alberti, Lorenzo Sirigatti and Annibale Carracci.

⁴⁰ They appeared between 1618 and 1622 under the titles: *De Colori, Prospettiva sel Colore, Prospettiva lineale* and *Della Descrizione dell'Ombre prodotte da corpi opachi rettilinei*.

⁴¹ KEMP 1990, pp. 132–133.

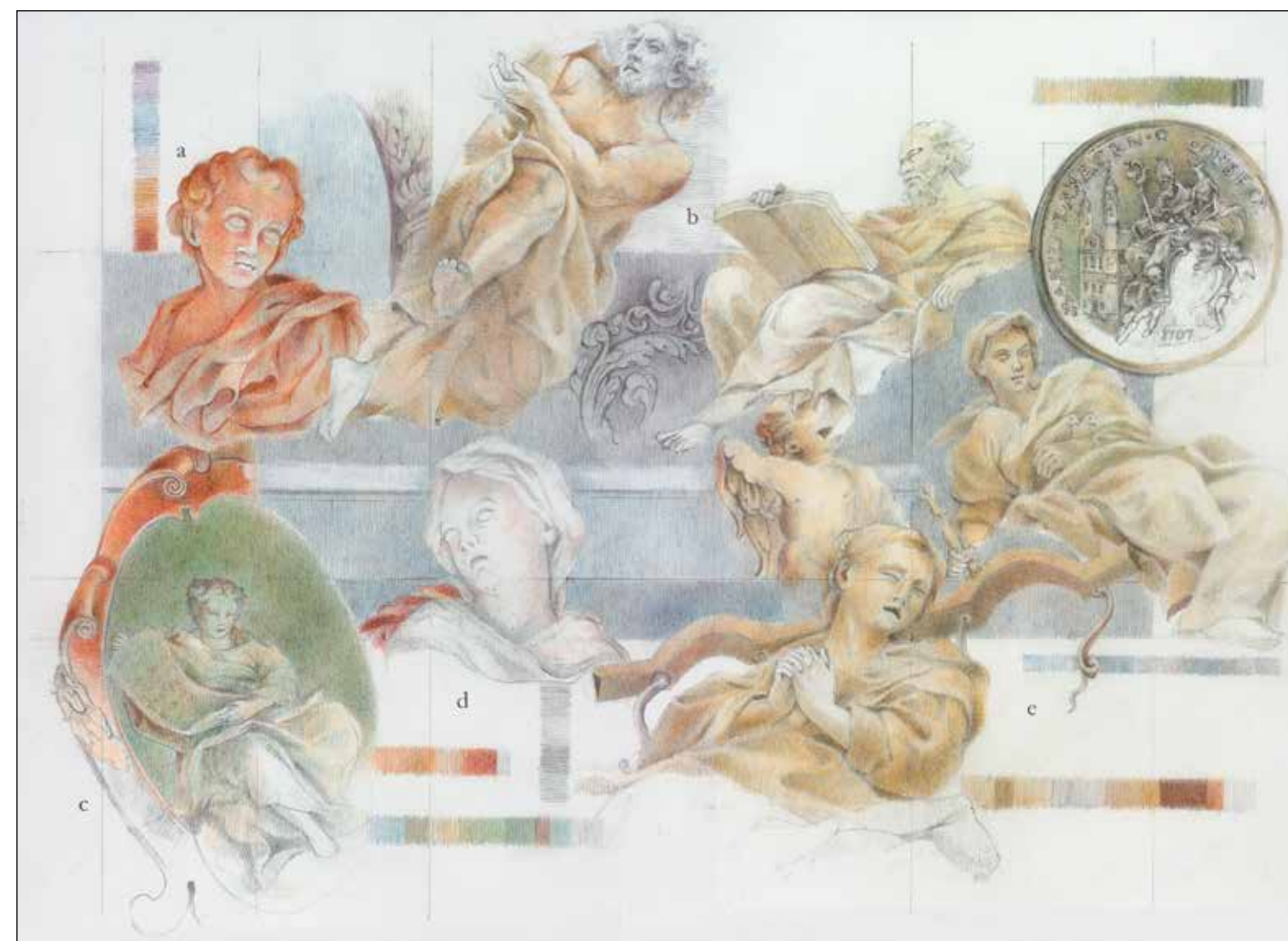


Figure 11: The monochrome illustration of sculpture and decorative details: a) cameo; b) stucco-work; c) bronze; d) alabaster; e) tufa – lime.

Italy was the main initiator of stylistic development, respecting the traditions and the earlier cultural periods that had shaped it. In comparison with Cartesian practice, this way of thinking was different, very demanding and complex. It was not just a matter of an encouraging tale about Heaven and the spiritual path leading to it, but about an illustration of the space which is eternal also because it shows the so-called objective world as an interesting part of its own reality. Illusionism combines various events into a single active event, a scene which treats time as a category in which the future, thanks to past and present experiences, is defined.

If Euclid said that "a point has no components" (*Elements*, Volume I, Definition 1), the dimension of the universe unites them. Its size is such that it is possible to imagine it only with abstract borders. So that we do not get lost in the breadth of our own perception of this phenomenon, perspective and other components of a composition

have the role of precisely and convincingly visually connecting what is most important into a thematic and energetic core as the moving force of everything to which the expressed attention is dedicated, not only because it directs towards that which is most sacred, but also so that its ubiquitous nature could be affirmed through care and will-power, in particular where due to fatal mistakes and flaws this would be most useful. Of course, this interpretation shows the existing understanding of space through the dimension of one's own experience of the objective world; where the lines of perspective conjoin, their path is finished. That which is beyond follows different rules in the understanding of size relations, as if a giant was looking through the window of a doll's house.

There is a fundamental difference between the use of perspective to determine, with the support of the currently applying methods and the geometrical arrangement of the components of the space dealt with,

³⁶ BERGAMINI 1994, p. 67.

³⁷ NORBERG SCHULZ 1971.

³⁸ Cf. BERGAMINI 1994, p. 174.

the location for individual subjects and their global position, and perspective as part of a particular system which builds, using architectural and other elements, a new space, the result of a different perception of its role and scope. In the first case perspective is a means, an approach enabling the artist to convincingly paint the planned story; in the second case, however, it becomes the goal, a part of the content and the proof of its successful realisation. Quaglio belongs among the masters with this type of understanding. The proof of this is the compression of events in the triangle that extends from the centre of the composition towards the presbytery. The stories included in it are arranged by independent perspectives, while the third connects them in the way that the universe combines differences, even extreme ones. The size and derivations of the architectural wreath and the planned frames are the most obvious proof of its presence and constructional worth.

In tune with this are also the moderately shown architectural details or wholes and geometrically more noticeable objects. The two triumphal arches and the altar on the left at the foot of the western one, the figures at the sides, the weapons, the attributes of the saints and Jesus' cross, the most materially expressed component of Heaven, are a relatively pronounced parts of the perspective and illustrate the distance of the painted scene. It was only in this way that Quaglio was able to put in the main characters, creating an opportunity for himself to "fill" a part of the composition with other figures, at times even in an improvised fashion. This, too, illustrates his feel for theatricality, for arrangement and for stress on the more important roles with regard to the "stage" in comparison with the less pronounced ones, for the effect of the mass, the group or the individual in the painting. In order to be visually and thematically suitable for every scene, they are shown in all their age periods; by illustrating the cycle of life, they show the integrity of time as a part of a more complex dimension.

In his direct interpretation of the three chosen themes, Quaglio was guided by the established methods of depiction, a number of what he probably judged to be positive experiences that were of course in line with and applicable to the concept of the picture he was creating, and findings that at least with regard to the size and the complexity represented an attempt to present his own vision of the events. Thus the group of apostles is probably iconographically least inventive, as in the gallery of dignified portraits, the stretch dividing the south and north walls of the nave, he showed consecration and wisdom, achieving their thematic effect simply with their characteristic stance. The central part of the vault, containing the Crucified Christ, the Holy Spirit, God and angels, undoubtedly representing the summit of the composition, is portrayed with the expected content, designed as a lively symbolic scene, subliminally representing the eternal. The quality of the image lies in the arrangement of the characters, whose orchestration meaningfully reaches outside the narrow frame into other areas. The interesting detail of the Crucified Christ, lifted by two angels towards the centre of Heaven, is an example of such planning.

Between these two themes there is the massacre of the Christians in Myra, an extremely dramatic portrayal of the power of religious conviction. In the shallow space with two shorter, apsidal terminated sides it surrounds the whole vault in a rhythm dictated by the intervals between the lunettes, dividing it into individual scenes. The choice of the theme is slightly unusual, not often occurring in the most frequently painted hagiographies of St Nicholas in the Eastern Church. In the Jesuit manual *Flos Sanctorum*, an outline of the life of the saints, followed by the whole of visual art at the time of Quaglio, the author Pedro de Ribadeneira deals with the example in a fairly concise and principled manner.⁴² There arises the question of what it signified at that time, to the painter and to the commissioners, to make them address worshippers with it.

Alongside the traditional *contrapposto* of individual figures and the orchestration of the selected groups into a theatrical effect, the movement of the scenes in the lower friezes and in the area of Heaven in the space is united into a harmonious order, giving the diverse activities their true thematic meaning. René Huyghe⁴³ has already drawn attention to the importance of such composition of works of art and Erich Gombrich,⁴⁴ too, added his explanation that it was needed as a way of achieving the task at hand. In addition to individual and group movement, it was the global that added to everything the dimension of time. In the case of the vault in Ljubljana, this kind of movement followed the circular form of the universe and from the centre, the Holy Spirit, orientated along Archimedes's (figure 12a) logarithmic spiral (figure 12c), including the energy of the emphasised events. It seems that this form, dealt with by visual and other arts (figure 12d) from the very beginning,⁴⁵ helped Quaglio's Baroque painting to preserve the diversity of scenes in a joint composition (figure 12b).

In Ljubljana Cathedral, the images from the upper part of the south and north walls to the centre of the vault followed spherical curvature, suggested by what is more a perception rather than an empirical form of the universe. In a certain manner, the perspective used – "*a quadro verticale*" – followed this and was slightly different from that planned by Pozzo's (figure 9b) "*graticolare*" or Ferdinando Galli da Bibiena's (figure 9c) reflective illustration of the spatial dimension of the objective world and following in a disciplined manner the individual parts dictated by it. In Quaglio's view, however, the abstractly designed form of the universe transcended the sense of such orderliness.

A particular additional connection between some of the thematic emphases was achievable thanks to scientific research into curves. A number of experts dealt with this issue and with mathematically measurable and

⁴² RIBADENEIRA 1700, p. 556.

⁴³ HUYGHE 1966, pp. 72–102.

⁴⁴ GOMBRICH 1984, pp. 182–252.

⁴⁵ e.g. in Mannerist architecture, Vignola's spiral staircase in Villa Farnese, Caprarola, after 1559 and the elyptical staircase in Palazzo Contrari and Palazzo Boncompagni in Vignola after 1559.



Figure 12: A spiral, a natural and artificial form as an element connecting motifs and combining themes: a) in mathematics; b) in architecture; c) in nature; d) in the composition of the painting on the nave vault.

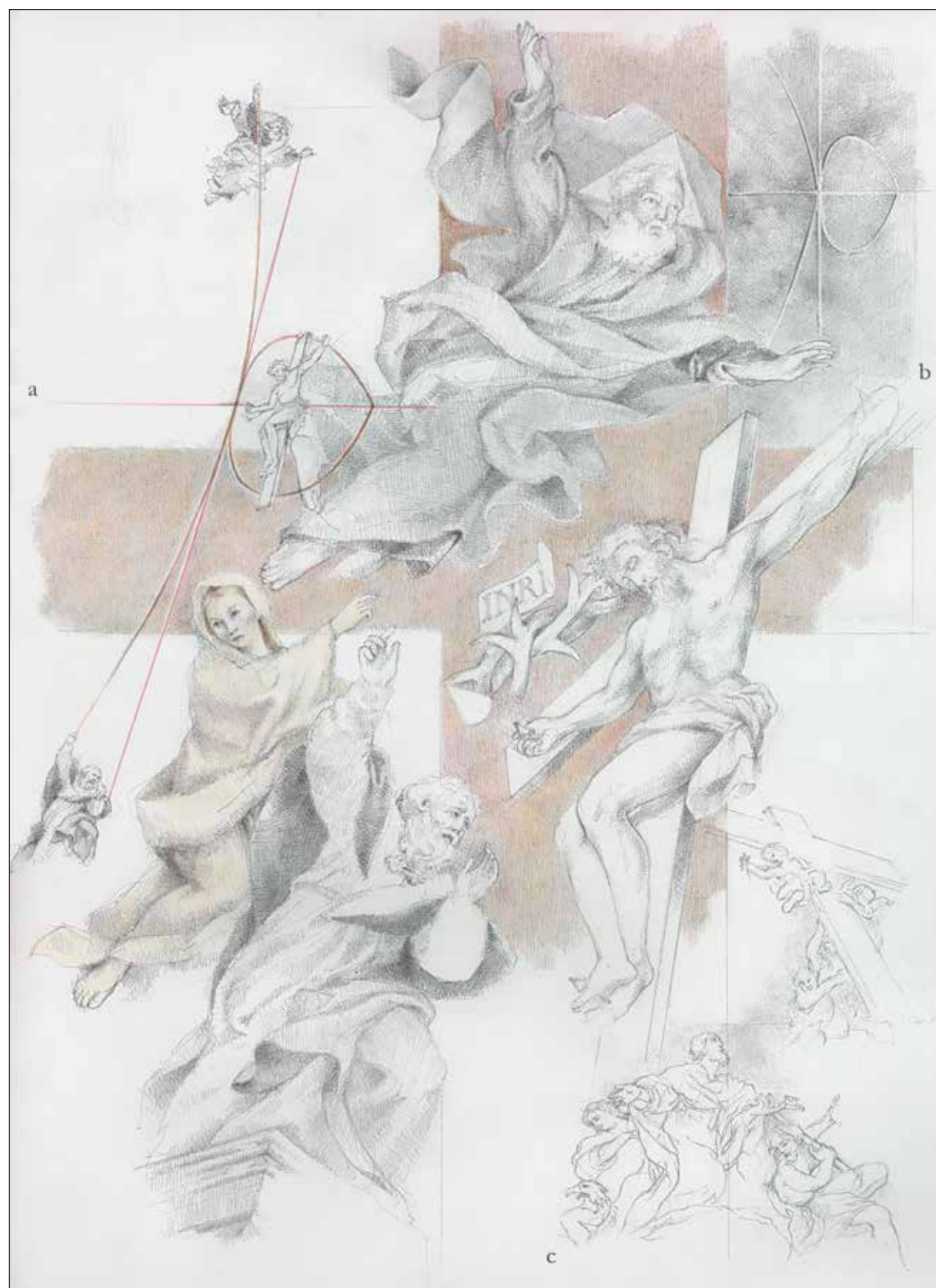


Figure 13: Geometrical design of the centre of the composition: a) figurative components and the curve connecting them; b) René François Walter de Sluse's Pearl; c) *The Apparition of the True Cross* – a sketch of the drawing by Quaglio.

provable methods established the discovered rules as personal patents of a kind.⁴⁶ With such a method of theoretical work the practical and empirical processes offered results in which the correctness of the conclusions arrived at was apparent and confirmed.

This synchronicity of the appearance of these results was undoubtedly the consequence of a complex understanding of the rules regulating the world, thus separating what was truly important from what was marginal. This is clearly evident in Quaglio's design of the central part of the composition, a detail that confirmed the deliberate and well thought out preparation of the execution of the plan and narrowed the possibility of random solutions. This part of the painting involves a connection between God, the Holy Spirit, the Crucified Christ and St Nicholas in the most visible section of the painting. A slightly curved conchoid, which surrounds the Crucified Christ in a noose and finishes in the figure of St Nicholas (figure 13a), is equal to the so-called Pearl of Sluse (figure 13b) identified in the mid-17th century⁴⁷ and is, of course, adapted to the dictates of the existing vertical perspective. It is almost certain that Quaglio was not aware of the mathematical law proven by this curve, but undoubtedly with a great deal of invested thought and understanding of the message of the theme, he was discovering it himself and included it in his own practice.

Occasionally, he emphasised the construction with straight lines, for example on the ceiling of the staircase at Palazzo Antonini Belgrado in Udine.⁴⁸ Where space in the composition did not have sufficient support in the perspective and architecture, Quaglio used elements close to geometry, such as weapons, in order to depict motion or its direction and, at the same time, to divide the surface. His mastery is shown in the fact that he did not treat them as a special result of intellectual endeavours, but as a natural, obvious procedure in artistic creativity. Thus he in a completely spontaneous manner emphasised the presence and role of St Nicholas in the tragic act of the massacre as that of a person overcoming the worst with his conviction and this contributes to his vision of the image of the Crucified Christ.

It is clear from the drawing "The Apparition of the Cross to St Peter"⁴⁹ how the preparatory study for such a scene might have looked (figure 13c). The sufficiently clearly defined relationship between the figures of the saint and the angels and the geometrically shown symbol with imperfect details indicates Quaglio's method of initial work, the sufficiency of the introductory role it plays and the leaving of the realisation of the

appearance of the painting to the painting procedure.⁵⁰ It is obvious that as a great practitioner, experienced in monumental painting, he shaped the course of preparations into a system that he adapted and organised in relation to the complexity of the task at hand and the circumstances in which it was taking place. With his positive attitude, he certainly subjected all activities to the achievement of the final goal.

THE EXECUTION OF THE PAINTING OF THE VAULT⁵¹

There are quite a number of operative factors that affected the execution of the prepared concept. Direct contact with the largeness of the walls and the ceiling and the given nature of their relief dictated an assessment and a possible correction of the planned realisation process. Quaglio's involvement in the building of the church, even in the way the nave vault was seen, contributed to the fact that there were no noticeable deviations, and it undoubtedly also helped with the objectiveness of the execution of the work.

Scaffolding and the transfer of the composition

Scaffolding is one of the key requirements for such painting, while its provision of access to the walls and its design created an appropriate atmosphere for creative work. As it is an important element both with regard to the execution as well as financing, Janez Gregor Dolničar mentions it in the construction of the nave vault, which was speeded up so that Quaglio could, after returning to Ljubljana from Laino on 10 May 1705, continue with the painting of the inside of the church, this time the nave.⁵² The existing building scaffolding served for painting purposes, too. It was certainly suitable for the preparation of the plaster and paint so that it supported the movable platform with which the builders and the painter were able to reach all the surfaces of the recently built curved ceiling. The difference between the platform and the support scaffolding must have been such that individual parts of the composition could be seen.

Somewhat uncertain is the issue of the manner of the transfer of the basic plan of the composition as the erected scaffolding, clearly closed

⁴⁶ Thus Descartes' findings developed into, for example, the logarithm spiral, known as *spira mirabilis*, discovered by Jacob Bernoulli (1654 – 1705), which in its spherical form corresponds with the concept of Quaglio's composition.

⁴⁷ René François Walter de Sluse, 1622 – 1685, his curve, named by Blaise Pascal, was proven between 1657 and 1698.

⁴⁸ Painted in 1698, BERGAMINI 1994, pp. 125–128 and 137.

⁴⁹ The drawing "The Apparition of the Cross to St Peter" from around 1702; now in the Musei Provinciali, Gorizia, in: BERGAMINI 2006, p. 207.

⁵⁰ Even in the older drawings, such as the preparatory drawing for the picture *Lato-na trasforma in rane i villici della Licia* for a painting in Palazzo della Porta in Udine (now in the Mullaly Collection, London), written about by BERGAMINI 1994, p. 67, Quaglio, in spite of his talent used this particular painting style, but for the realisation of a specific work; he did use it later, however, during the process of painting, to supplement and even finalise individual parts of the painting.

⁵¹ In addition to the already mentioned literature, compare also: Ernst Berger, *Quellen für Maltechnik während der Renaissance und deren Folgezeit XVI. -XVIII. Jahrhundert* (ed. Martin Sändig), München 1901; Kurt Wehlte, *Wandmalerei, Praktische Einführung in Werkstoffe und Techniken*, Ravensburg 1962; Max Doerner, *Material und seine Verwendung im Bilde*, Stuttgart 1941; Cennino Cennini, *Il Libro dell' Arte*, Vicenza 1971; Metka Kraigher Hozo, *Slikarstvo – Metode slikanja – Materiali*, Sarajevo 1991; Milorad Medić, *Stari slikarski priručnici*, Beograd 1999.

⁵² DOLNIČAR 2003, pp. 139–140, pp. 152–153 and 305–306.

because of its original purpose, did not facilitate a projection on the ceiling. The projection, theoretically dealt with by Pozzo and Ferdinando Galli da Bibieba, demands an open painting surface (figure 9 b, c) so that the net and its tectonic outline can be reflected on the ceiling with the assistance of shadow, produced by a light positioned at the viewer's eye level, placed in an axis the position of which determines the meeting point of the diagonals of the space in question. The existing scaffolding and the short deadline required a different method of quadratura or dividing up of the composition in order to apply it to the surface of the vault. Quaglio was from experience very familiar with the role of lunettes that reached into the structure of the vault, dividing it in a way into smaller units and above all providing geometrical and tectonic support for the placement of individual parts of the painting (figure 9a). Thus the three planned frames could be placed into a rectangle of the ceiling only on the basis of the architectural plan. The distances between them were determined with the planned dimension of the image and the size of the figures included. The shift towards the presbytery of the meeting point of the diagonals and the vertical connecting this point with the ideal starting point on the church floor shows that the lunettes signified a de facto division of the painting surface.

In this way it was possible to carry out the quadratura without a special projection of the construction of the composition by placing it in perspective, which is shown by the thinning of frames with regard to their distance and the foreshortening of figures towards its centre. The size of an individual scene was determined by the space dedicated to it, as it matched the size of everything encompassed in the picture. This is why the *sinopia*⁵³ onto the first plaster – *arriccio* – included mainly the painting's geometry, on which the rest was based; the drawing of the frames was imprinted into fresh plaster with a hard tool and served as a basic engraving for all the subsequent work. By measuring the distances from the walls and with a careful transfer of the borders of individual surfaces from the preparatory drawing of the composition, Quaglio adapted the *sinopia* process, thus gaining time and avoiding any possible organisational mishaps. At the same time he gained from the results of the accomplished quadratura a sense of the reality of the execution of the prepared composition and an opportunity for the first judgement of the suitability of the drawn frames and the quality of the plaster.

The process of painting

Judging by Dolničar's chronicle, *intonaco*⁵⁴ was also applied relatively quickly, too. The second layer of plaster, in comparison with the first, with regard to the grainy texture of the sand, the structure of the lime

and the ratio of their quantity, created a surface on which it was possible to draw and apply paint, including the final levelling and corrections of individual surfaces.⁵⁵ Quaglio was thus able to immediately execute the drawing of the prepared design in its final size and then gradually supplement it and change individual details. He only partially needed the cartoons prepared for the placing of the key figures in terms of the event taking place and the role they played in the composition. As restoration analyses show, he did not attach them to the fresh plaster with nails, as was general practice,⁵⁶ but only leant them on the surface and drew a few lines, finishing and supplementing other parts with a brush.⁵⁷ It is possible that he had help with this or perhaps he carried the transfer out himself, depending on the complexity of the detail. Equally important was the determination of the sequence of the *giornate*, the parts of the surface that it was possible to paint in a limited time. These depended on the speed and skill of the execution, the personal method of painting frescoes and the circumstances as they appeared at the time and influenced the work. Thus the building of the vault and the application of the first two layers of plaster in a relatively short period of time, i.e. during late winter and the first half of spring, initially resulted in the slower drying of the layers of paint and facilitated that the *intonaco* on the less demanding part became the final surface (figure 14a, b). In contrast to the *arriccio*, the *intonaco* was only a part of the painted surface, not its bearer.

The prepared designs, the confidence acquired through experience and the creative intentions were present in the final image which appeared on the final, third layer of plaster that had to be fresh and which changed into a firm and permanent layer (figure 14c). It combined all Quaglio's well-thought out efforts, tested the skills of his own and other professions, driven by a similar curiosity about the secret of man's conviction, with which he is able to reach into dimensions that are measured differently.

The selection of colours shows a striving for a more pronounced spectre and a relationship between light and dark colours, not just as a dialogue produced by the contrasts, but also as a thematically harmonised way of expressing emphasised, important or conflicting situations. It is colours and light that achieve the effect that can be defined using aesthetic criteria, whereby the story itself does not represent the main origin of the artistic expression.

In practice this means a large colour spectre of pigments,⁵⁸ requiring that they are obtained in time. The supply and final preparation of paints was in every *bottega* a standardised, precisely managed process. The quality of the paints and their choice depended on their price,⁵⁹ sometimes

⁵³ KOLLER 1990, p. 63.

⁵⁴ See the contribution by Rado Zoubek, *Conservation-restoration project and Quaglio's painting process*.

⁵⁵ See the contribution by Rado Zoubek, *Conservation-restoration project and Quaglio's painting process*.

⁵⁶ See the contribution by Polonca Ropret, *Investigations of colour layers*.

⁵⁷ BERGAMINI 1994, pp. 126, 134, 137, 141 mentioned the example of the decoration of Palazzo Antonini Belgrado.

⁵³ The expression *sinopia* – the name points to the town of its origin Sinope – does not mean just the execution of the drawing with paint, but also all the other procedures of imprinting or using powder and applying it through the perforation of lines on the cartoon etc., which in the 16th century became a part of the practice of wall painting.

⁵⁴ DOLNIČAR 2003, p. 152 and p. 305.



Figure 14: The relation between line and colour – from the planning stage to the final colour image: a) *intonaco*; b) *arriccio*; c) painted surface.

also the quantity available. The discovery of new sources of minerals or the organisation of new ways of acquiring them created prestigious, fashionable phenomena⁶⁰ that enlivened the technological side of art.⁶¹ This hinted at the generally applicable sensual perception of colours, within which man has perceived the visible characteristics of the objective world. Painting methods tried, by using various approaches and skills in the use of their basic elements, to go beyond these limitations, while sciences contributed their share to development that accompanied the explanation and understanding of reality through aporias.

The initiator of the treatment and mathematical definition of optics was the author of the treatise *De aspectibus* (Kitab al Manazir) and multifaceted Arab scientist Alhacen or more precisely Ibn al-Haytham;⁶² his findings, which took knowledge from Antique theories to build the

foundations of optics and motivate various sciences to deal with optical issues more actively, were in the 17th century reflected in the work of Kepler, Descartes and Huygens.⁶³ It is interesting that, had his work in Ljubljana been more widely known, Quaglio would have been able to directly contribute towards progress in this area of physics.

With a method of correcting the deformations of objective reality that encumber man's visual perception, Greek architecture used to make it possible for *techné*, art, science and philosophy to realise not only that it is possible to go beyond one's own sensory limitations, but also to supplement them with transcendence and change the quality, the extent of this depending mainly on the power and imaginativeness of creativity. Thus a seemingly simple entasis with its encroachment into the essence of the material enabled numerous activities to confidently, even vainly, humanise reality according to their own judgement, even that which arose as an unexpected coincidence.

On the basis of this, serious research into the visual started in modern times using the foundations of medieval studies on optics. The Baroque

⁶⁰ For example, America, in addition to new metals, plants and other resources, offered special colour pigments.

⁶¹ The rational use of ultramarine blue made of lapis lazuli is a well known example.

⁶² Ibn al-Haytham was born in 965 in Basra and died in 1039, probably in Cairo.

⁶³ FARUQI 2006, pp. 395–396.

developed it further, directing it towards various purposes, from the objective to the imaginary, from the useful to the absurd. Thus an interpretation, based on physics and mathematics, of such an image of the world which could be recognised by the viewer on the basis of spatial, formal and colour characteristics as real, was a binding task; the two sciences thus had to keep improving the complexity of their methods in order to train the way of seeing and because of the resulting increased visual capabilities. Visual art and architecture followed this and used the results obtained, adding their own findings. Alongside the many versions of perspective and the calculated reductions, anamorphosis became an interesting part of the practice of artistic expression.⁶⁴ It involved a pronounced transformation of the selected form of a particular room or building in line with the law of optics, with the intention of showing its real image from a particular viewing angle.⁶⁵ Even the Baroque found this procedure and the special skill involved in incorporating the changes achieved quite complex, although it had a great fondness for such endeavours. Thus Kemp's observation is correct that in view of the general interest in this area of optics, the actual use of it in illusionist programmes until the early 19th century was quite modest.⁶⁶ Andrea Pozzo belongs among those who during this period contributed to the establishment of perspective anamorphosis; the expert opinion is that he did this most clearly in the painting on the false dome in St Ignazio church. In Quaglio's decoration of the nave vault it is, however, barely noticeable, as prior to this in the apparent dome, so that the question arises of whether there was an intention of using anamorphosis in the scenes involved.

The painter's attitude to the third phenomenon relating to the limitations of depicting the imagined – *trompe-l'oeil* – was considerably different. It is used for achieving persuasiveness of realism in places which can make a considerable impact on the theme of the work itself. Realism here is not a stylistic quality, but a technique contributing towards the accessibility of the facts, advocating the theme of the picture and with which it tries to persuade the public to believe in its higher meaning. The history of this procedure was a very long one, with ever newly substantiated reasons for its use and the method of execution. One of the reasons it suited the Baroque was that it bridged discomfort and individual discrepancies or simply convinced with its approaches in reality or what is actually shown. The method also provided a way of testing the artistic capabilities of individual painters, measurable by facts from the objective world.

This certainly applies to Quaglio. Through *trompe-l'oeil* he proved the reality of his own idea. The imitation of the material used in sculptures, the method of turning them into rounded plastics or reliefs is so extensive that the resulting sculptures became quite a complex and characteristic element of the composition. The emphasis on a single colour – more

in impression than actual implementation – was based on the mastery of the rules of shadow,⁶⁷ a skill Quaglio proved to have also in his more colourful images. We can certainly find a number of monochrome solutions even when he was transcending the spatial limitations, replacing the use of decoration, and so on.

With all this he not only satisfied the impression of the diversity of values shown in the scenes of the apotheosis of St Nicholas, but proved that with a suitable method he was able to realise everything he had planned and which he thought belonged in the painting. He did this very spontaneously and it is this *legerezza* that shows a hint of virtuosity, i.e. adroitness subjected above all to the quality of the realisation of his idea.

A common feature of all three sections of the composition – Heaven, the massacre and the apostles – is the domination of figurative art, which depicts man and his actions as they are in reality, as well as all the elements which prove the human reality of his spirituality. Everything else that helped Quaglio to realise his idea is just an obvious aid, a kind of supplement or stylistic decoration of the structure and texture of the individual scene. Thus the large painting on the nave vault can be understood as a musical theme, which with a large number of variations appears in all three movements, pointing to the combined thematic essence. Thus the human figure drowns the sound of all the other components of the mighty scene for the benefit of the clarity of its message. But the exceptional and distinctive quality in the concept of the composition is the moderation of emphasis and the number of figures that appear. There is no exaggeration in the spirit of *horror vacui*, which would fill the absence of any other possible components, no trivial perseverance in the fulfilment of established, merely formal principles. It is obvious that this approach was the consequence of the mature motivation with which Quaglio tackled the task.

Fresco painting is a demanding procedure, involving a special use of paint or pigment bound with hydrated lime,⁶⁸ a procedure which shows its true nature only after a certain time, when the paint and its binder are fully dry. Irrespective of experience, the method is based more on the anticipation of the actual colouring of the painting.

The gallery of apostles, painted between the windows with richly decorated frames, signifies where the wall becomes the nave vault. Placed into imagined framed alcoves, i.e. spaces between windows with richly stuccoed frames, they are shown as portraits in order to be recognisable; at the same time, the method of presentation and the colour concept mean that they appear as a unified group, which with its significance and presence fulfils a common task within the whole scene. The seriousness and dignity of the portrayed persons are achieved through an expressive,

but subdued *contrapposto*, while a series of precisely treated details of the drapery, decorations and subjects further emphasises the traditionally designed execution of the figures. Particular attention is paid to the harmony between the coloured dimensions and their subdued effects. The distribution on the walls and the geometrically precise placement of the portraits imbue the entire scene with a sense of rhythm.

In the higher section, the rhythm becomes more pronounced and complex and is transferred to the colourfulness of the scene. The massacre of Christians in Myra in all its elements is shown dynamically and contrastively. It is designed as a frieze, surrounding the nave and the central part of the composition. The lunettes cover rather than interrupt it, which is why the continuity of happening is obvious, in which, as in related motifs of conflicting situations, the group carrying out the violence and the one representing the victims are painted in thematic contrast. The concentration and modelling create a more pronounced tension here than elsewhere, and this tension is a quality of the theme. In addition, the tonal shading creates equal relations of light and dark elements, mainly with the intention of marking the plastic nature of the painted forms.

Also of interest is Quaglio's attempt at transferring such an approach into the temporal dimension of the theme. Ribadeneira's hagiography of St Nicholas confirms that the greatest pogrom of the Christians was carried out by the Romans at the time of the Emperors Diocletian and Maximianus.⁶⁹ The Bishop of Myra encouraged the citizens in their religious conviction precisely at the time of the latter, so those carrying out the massacre are shown with weaponry similar to that used by the Romans. But there are also some wearing Turkish clothes and using corresponding weapons. The unusual combination of armies so remote from each other in time, in this case united in a common task, proved the perpetual topical nature of the worst conflicts in various circumstances, just as the types of violence are a kind of a constant. During the painting of the massacre, a war was being waged close by between French and German forces over the succession to power.⁷⁰ The presence of Turkish soldiers drew attention to the increasing threat to European states posed by the Ottoman Empire, as not long before, in 1682, Vienna had survived its siege and in 1687 the Republic of Venice fired at Athens from its ships.⁷¹ The difference in the way of dressing in the East had already excited the imagination of Renaissance masters, such as Gentile Bellini,⁷² while during the peace between the leading states Turks could also be seen in the

cosmopolitan Vienna. Exotically coloured scenes were frequently used as subjects in the visual arts,⁷³ they were something familiar even with regard to the details of individual characteristics.

In addition to human figures, the frieze includes horses, also on the side of repression, again a relatively frequent motif which Quaglio, in accordance with his style, mastered in various dimensions as a main feature of the central event.⁷⁴ The most lively and contrastive part with regard to colour is the space which includes allegories, angels, putti and various decorative elements, which have, in addition to a religious and mythological character, a historical one. This content summarises all of the past experience of this artist, in which is expressed an echo of various contrasts, from battles and crimes to the frequent murders and kidnaps he had dealt with directly. However horrible the scene is, it is encouraging in its interpretation as in its essence it celebrates the victory of religious conviction, which is stronger than any fear or the consequences of the perpetrated frenzy.

The highest part of this monumental painting is Heaven, a frequently occurring image in Quaglio's work even before his Ljubljana project. If the choreography of the relatively few figures, in particular the Holy Trinity and the angels, was iconographically determined in advance, this scene is interesting and imaginative mainly with regard to colour. The painted light is like the centre of the universe, the thing that governs it and gives it substance; the whitish yellow glows both symbolically and actually, just as the gold colour represents the characteristics of this fine metal, which is considered the most noble among the elements and the most perfect among substances.⁷⁵ The encounter with blue in the same pictorial field creates a true counterpoint in infinity. In spite of their chromatic differences, this difference signifies the vibrancy of energy and without both being included the key element would not exist and there would be no space for the events in Heaven.

The placing of figures was a very complex task as they could not cover the most eloquent parts of the abstractly painted dimension of space, nor were the colours supposed to detract too much attention from it. On the other hand, the figures had to be noticeable enough, as they included sacred individuals. This meant that the painter depicted them in similar artistic conditions to Heaven and everything surrounding it, dominating the composition. Quaglio thus achieved an exceptional result: it is possible to aesthetically define this part of the painting with its religious content as sublime and with it, the work as a whole acquired an exceptional quality.

On the basis of analyses carried out by the Restoration Centre and logical conclusions relating to the course of the execution of the fresco, taking into account the methods used at that time, an individual cycle of

⁶⁴ KEMP 1990, pp. 207–212.

⁶⁵ Anamorphosis is considered to have been invented by Leonardo da Vinci; he drew attention to it in CA 191ra.

⁶⁶ KEMP 1990, p. 212.

⁶⁷ This is an area dealt with by various theories, including geometry, such as, for example, the manual: Elia Bonci, *Elementi della teoria delle ombre*, Milano 1908.

⁶⁸ See the contribution by Rado Zoubek, *The conservation--restoration project and Quaglio's painting process*.

⁶⁹ RIBADENEIRA 1700, p. 556.

⁷⁰ DOLNIČAR 2003, p. 146 and p. 152 or pp. 156, 158, 159, 309, 312.

⁷¹ In this military conflict, the shooting also damaged the Acropolis, in particular the Parthenon.

⁷² Between 1480–1490 a portrait of Sultan Mehmet II, currently in the National Gallery in London; between 1479–1481 the painting *A Turkish Scribe* (Oturan Katip), currently in the Isabella Gardner Museum, Boston; between 1504–1507, a painting of St Mark preaching in Alexandria, currently in the Pinacoteca di Brera, Milano.

⁷³ Albrecht Dürer, *Three Orientals*, watercolour 1494–1495; Pieter de Jode, *A Scene from the Venice Carneval*, oil on canvas, 1595–1598.

⁷⁴ w.g. *Faeton's Fall* on the ceiling of a hall in Palazzo Belgrado in Udine, painted in 1698.

⁷⁵ ELIADE 1982, pp. 53–55.

giornate undoubtedly took place within the borders of the frames.⁷⁶ Judging by that, the first part to be realised was the central section of the composition, not only because of the technological demands involved, but because its complexity and personal style, shaped by the circumstances of the execution into a variant of the generally applied practice, presented to Quaglio the starting point for the whole painting.

The sequence of *giornate* thus depended more on the concept of the construction of the scene, on observations resulting from the comparison of the already painted parts and, of course, on the possibility of supplementation and correction of details. Thus the extent of an individual *giornata* did not necessarily refer to the time of the drying of the plaster and the process of the hardening of the layer of paint; this is shown by the restoration analysis, which found that although Quaglio was painting a fresco, he emphasised and perfected certain sections when the plaster had already dried⁷⁷ (figure 14c). The difference in the size and complexity of the details on each *giornata*, like the fact that the number of them matches the extent of the time used for the entire painting, supports the thesis that he carried out his task in a more dynamic and complex manner, with more combinations than thematic manuals and treatises would prescribe.

From this point of view, the difference of the conditions for the execution of the central scene together with the other two – the massacre in Myra and the gallery of the portraits of apostles – is only a part of the challenge that the painter was able to masterfully resolve. This difference was apparent during the disciplined and less perfected painting of, for example, decorative elements in the lunettes and the creatively encouraging staging of dramatic scenes, in a similar way to the parts of the painting with pronounced colour and shades of figures in monochrome, and the scenes equipped with details in comparison with those that simply did not need such detail or which it was impossible to show in a qualitative way. Ways of making use of the opportunities offered and defying problems are processes that put monumental painting among the most demanding modes of artistic expression.

QUINTESSENCE

Giulio Quaglio designed and harmonised the idea, put forward indirectly by the commissioner or the Ljubljana citizens, into a composition, while space as a co-designer enabled its realisation, and colour gave it its final appearance. Thus the components of all four elements create the actual values of the painting in its construction and its three parts a consistent dialogue between that which is a direct artistic act and that which has been contributed by the prevailing circumstances. A special feature of monumental creations in particular is that with their presence they satisfy the purpose for which they were created,

while their theme directs the user into a true intellectual, emotional and sensual experience.

Quaglio's true artistry is shown not only in the described opulence of numerous cultural, scientific and artistic solutions of which the nave vault in Ljubljana can boast, but also in the fact that alongside all this – all that is shown and all that represents its foundations – it enables the realisations that arise from looking at it or personal ways of interpretation.⁷⁸ He clearly needed such an opportunity in order to be able to fulfil the given task in line with the criteria applying at the time and those that he had set for himself; he understood creativity as a professional fact and an obvious necessity.

Not only the technological possibilities, but also the simple approach to the artistic challenge protected him from superfluous, often useless deviations into individual special features, thus helping him to conclude, with the aid of the fifth element – light – a thematic and formal concept within the conditions for its execution. Similarly to Empedocles's (figure 4c) Eleatic explanations of nature, especially the unifying principles of love and struggle,⁷⁹ and Aristotle's thoughts on substance (*Metaphysics* VII 16, 1042 a-b) he defined his new element as a category which guided what was painted into an ordered, organised system. It is beyond any doubt that Quaglio gave it meaning with his inborn feeling for order and in harmony with the process of the creation of the painting; thus it was not a result of the rational use of physical, metaphysical and other interesting findings, but of his intention to show the integrity of a complex idea.

In it, the fifth element has two origins. From the centre of Heaven it emerges as divine inspiration, of course as a perfect colour quality in space (figure 15a). The shadows painted here do not express the conflict between the light and the dark, but instead they simply serve as a support for light, so that through it the diversity of the immaterial colourfulness can be expressed. The second starting point is daylight – realistic, dynamic, flexible and as intense as is permitted by each season; it is thanks to daylight that the apostles can be seen in the lower part (figure 15b). In the middle part, meanwhile, the two lights meet and each in its own way contributes to the dramatic nature of the event, merging in the same way as elsewhere into its substance. Quaglio accepted light as a basic element which has its own expressivity; with it he masterfully linked the created difference between individual scenes and changed their diversity into a quality, a part of which it itself became (figure 15c).

The removal of the scaffolding on 19 July 1706 signified the actual completion of the painting of the nave vault in Ljubljana Cathedral, the completion of the combined efforts of his successful *bottega* on what was the most demanding and at the same time most stimulating project. It also meant that the artist now became a mere spectator⁸⁰ who was able,

⁷⁶ On the cultural-historic initiative: TRSTENJAK 1981, pp. 364–371.

⁷⁹ EMPEDOKLES 2007, pp. 27–150.

⁸⁰ Probably until his departure for Škofja Loka on 25 August 1706.

⁷⁶ Cf. fn. 68.

⁷⁷ Cf. fn. 68.

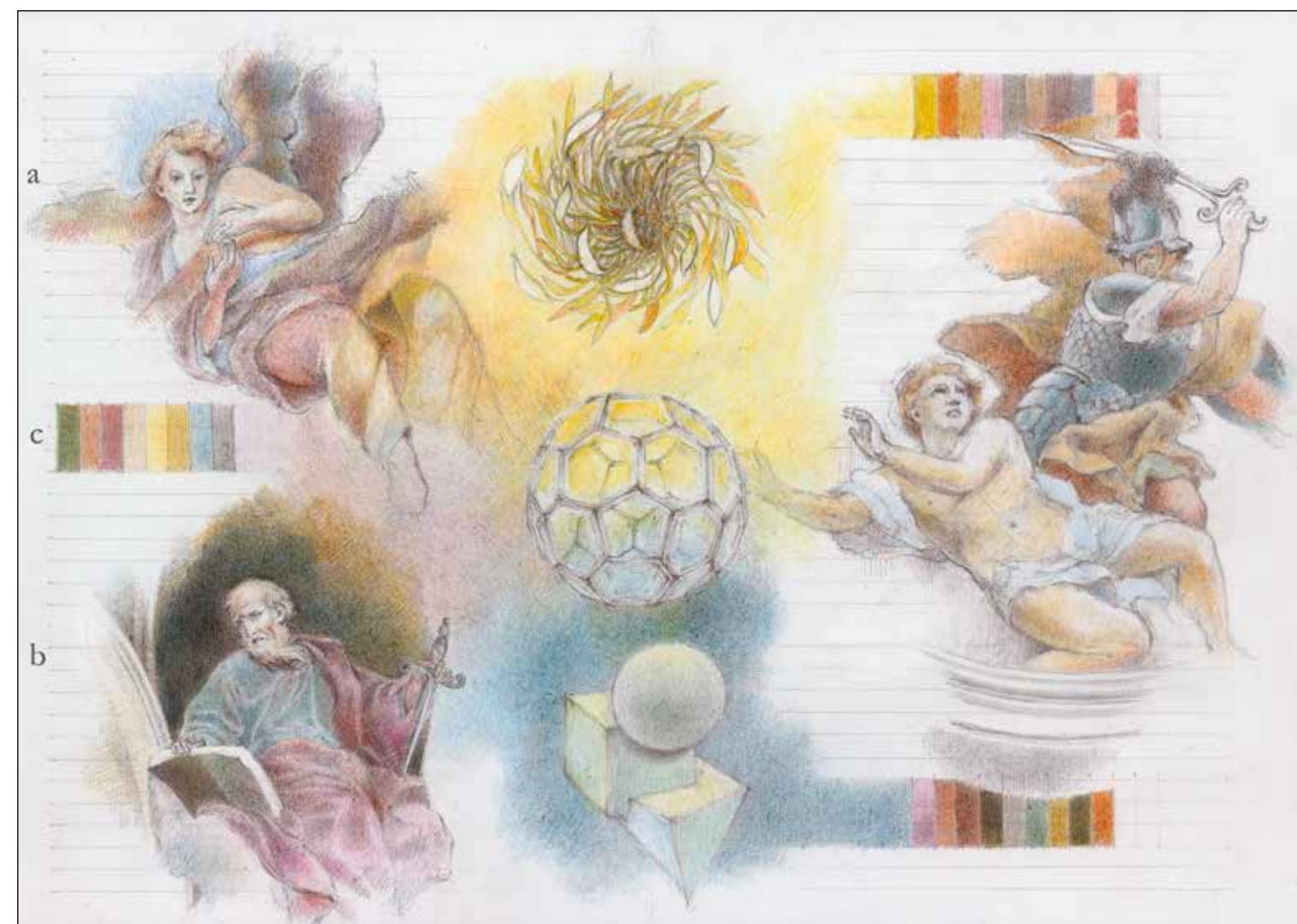


Figure 15: The fifth dimension, light: a) light from heaven; b) daylight; c) combined light.

with others, to establish from a distance the quality of his work and, in contrast to others, judge in a much more professional way to what extent the given goal had been realised.

INSTEAD OF A SUMMARY

The distance of an artist from his own work probably changes the perception of the picture as a finished work, which even to him seems unreachable. At a suitable distance there appears a point from which it is possible to see what in the quality of the picture is the significance of the cultural givens and what is the direct consequence of artistic practice, in contrast to how much the results allow the person the artistic work addresses to comprehend different elements in a different way, thus arriving at new truths.

A tangible answer to the issue of that quality of an individual work that is the consequence of the creative processes is undoubtedly offered by the philosophy of art, especially with regard to the issue of certain processes that have formed the appearance and given substance to the period in which they took place. It can be understood as a method which with the synthesis of thought can reach beyond the created values into

the reasons for and effects of their presence and with the realisations obtained define the principles and laws of art and culture as civilisational acts. Its speculations thus build a reference system, a measure of quality, while at the same time giving meaning to the tools used in the general comparison of the achieved results within individual time periods.

Artistic questions can be a special area of intellectual treatment or merely an interesting part of wider social issues. It is in this light that it was seen by Giambattista Vico (figure 7a) of Naples, who created his own image of the world through anthropocentric realisations. He was an individual whose thoughts, in spite of occasionally unusual orderliness and inconsistent derivation, are still closest to the philosophy of spirit,⁸¹ in short, he was an individual whom every period discovers in its own way, drawing attention to the necessity of his presence in anthologies and theories of European thought.

The philosopher's contemporary Giuglio Quaglio⁸² (figure 7c), orientated in the same direction as Vico although unaware of it, was discovering in

⁸¹ As defined by: CROCE 1934, p. 315.

⁸² Gianbattista Vico was born in the same year (1668) in Naples, and died also in Naples 1744.

a different way to rationalists the mathematically defined truth through rules derived from his own experience. He gradually acquired knowledge that showed spiritual understanding of the established standpoints, based on the initiatives of scientific findings, such as discoveries accessible primarily to those capable of comprehending them and reflecting them in the quality of their work.

Also related was their view of historical facts and acts that constituted the true dimension of time, giving meaning to its intervals and offering real incentives through their preserved values. The rhythm of movement through time intervals, the definition of distances and the combination of valuable themes were the opportunities for inspiration, that *licentia poetica* of creative work; we cannot neglect here the generally accepted facts which various professions have illustrated and confirmed through their work, which with its quality offered new solutions to problems.

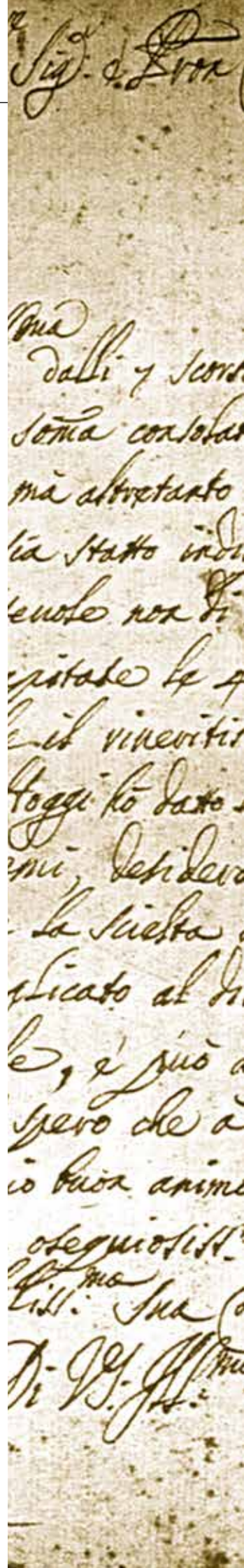
The bridging of 'lacunae' – or empty spaces of a kind, certain constants with a supposed content – the method of arranging the established facts within the texture and structure of individual periods into a meaningful whole, and the supplementing of the created act with emphases that give things their true meaning, was the main duty of imagination.⁸³ Its direct role was stressed by Vico, especially in his book *Scienza nuova*,⁸⁴ while Quaglio constantly enacted it as a characteristic of creative work with the same goal.

Thus the basic characteristics which define a creation, placing it into a social and temporal framework, offering a possible comparison with other acts and evaluations of quality, are a consequence of a scientifically empirical, sensual-intellectual process, historical, mythological and remembered facts and the ability of imagination: in short, a creative process of discovering the truth, or as Vico called it, *verum factum*. Undoubtedly, that which gives meaning to the similarity between Vico's theory and Quaglio's practice is the difference of the noticeably more humanistically and socially oriented understanding of the actual as the consequence of rational, imaginative and other processes that helped create the character of the social spirituality of a specific period in Italy and elsewhere. Thus in this case, style is not just a method of expressing a certain level of the artistic creativity of a certain period and not only the proof of the organised, disciplined illustration of the agreed themes and thematic areas, supported by the references of artists, scientists, leading ideological, political and economic factors, the creators of public opinion, but also a reflection of the mentality of a certain time and society, which was a kind of depiction of conscious and accidental intentions, as well as everything connected or divided by it, either intentionally or unintentionally.

⁸³ DELLA VOLPE 1979, pp. 43–45.

⁸⁴ It was published for the first time in 1725 in Naples; the importance of Vico's aesthetic conclusions was established in particular by Benedetto Croce in his book *Estetica come scienza dell'espressione e linguistica generale*, Milano – Palermo – Napoli 1902.

Abbreviations
Sources and literature
Sources of the visual references
Contributing authors



Abbreviations

ALUO – Akademija za likovno umetnost in oblikovanje (Academy of Fine Arts and Design)
 AS – Arhiv Republike Slovenije (Archives of the Republic of Slovenia)
 cons. – conservator
 cons.-rest. – conservator-restorer
 cons.-rest. adv. – conservation-restoration adviser
 cons.-rest. contractor – conservation-restoration contractor
 cons.-rest. coun. – conservation-restoration councillor
 cons.-rest. tech. – conservation-restoration technician
 EŠD – evidenčna številka dediščine / record number of the heritage item
 FA – Fakulteta za arhitekturo (Faculty of Architecture)
 FAGG – Fakulteta za arhitekturo, gradbeništvo in geodezijo (danes FGG) (Faculty of Architecture, Civil Engineering and Geodesy (today FGG))
 fn. – footnote
 fasc. – fascikel / file
 FKKT – Fakulteta za kemijo in kemijsko tehnologijo (Faculty of Chemistry and Chemical Technology)
 FTIR-microscopy – Fourier transform infrared microscopy
 GIS – Geodetski inštitut Slovenije (Geodetic Institute of Slovenia)
 IJS – Institut Jožef Stefan (Jožef Stefan Institute)
 inv. no. – inventory number
 IPCHS – Institute for the Protection of Cultural Heritage of Slovenia
 KAL – Kapiteljski arhiv (Chapter Archive)
 LRS – Ljudska Republika Slovenija (National Republic of Slovenia)
 LRZSV – Ljubljanski regionalni zavod za spomeniško varstvo (Ljubljana Regional Institute for the Protection of Cultural Monuments)
 MK INDOK centre – Ministrstvo za kulturo Republike Slovenije, Informacijsko-dokumentacijski center (Ministry of Culture of the Republic of Slovenia, Information-Documentation Centre)

NUK – Narodna in univerzitetna knjižnica (National and University Library)
 NŠAL – Nadškofijski arhiv Ljubljana (Archiepiscopal Archives Ljubljana)
 OM – optic microscopy
 PDF – powder diffraction file
 RC – Restavratorski center (Restoration Centre)
 RH – relative humidity
 RS – Republika Slovenija (Republic of Slovenia)
 rkp. – manuscript
 SEM/EDS – Scanning Electron Microscopy / Energy Dispersive Spectroscopy
 senior con.-rest. – senior conservator-restorer
 SNL – Stolnica sv. Nikolaja v Ljubljani (Cathedral of St Nicholas in Ljubljana)
 SRS – Socialistična Republika Slovenija (Socialist Republic of Slovenia)
 SV – spomeniško varstvo (Monument Protection)
 ŠAL – Škofijski arhiv Ljubljana (Episcopal Archive Ljubljana)
 T – temperature
 UV – ultraviolet light
 VIS – visible light
 VS – *Varstvo spomenikov / Journal of Monument Protection*
 ZAL – Zgodovinski arhiv Ljubljana / Historical Archives of Ljubljana
 zg. zap. – historical records
 ZAG – Zavod za gradbeništvo Slovenije / Slovenian National Building and Civil Engineering Institute
 ZRC SAZU – Znanstvenoraziskovalni inštitut Slovenske akademije znanosti in umetnosti / Research Centre of the Slovenian Academy of Sciences and Arts
 ZRMK – Zavod za raziskavo materialov in konstrukcij / Institute for the Research of Material and Construction
 ZVKDS – Zavod za varstvo kulturne dediščine Slovenije / Institute for the Protection of Cultural Heritage of Slovenia
 ZVKDS RC – Zavod za varstvo kulturne dediščine Slovenije, Restavratorski center (Institute for the Protection of Cultural Heritage of Slovenia, Restoration Centre)
 ZVKDS OE Ljubljana – Zavod za varstvo kul-

turne dediščine Slovenije, Območna enota Ljubljana (Institute for the Protection of Cultural Heritage of Slovenia, Ljubljana Regional Office)
 ZUZ – *Zbornik za umetnostno zgodovino (Journal of Art History)*
 ŽA – Župnijski arhiv (Parish Archive)
 μPDSM – Micro Powder Diffraction Search Match

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ŽELEZNIK 1948, Poročilo: Peter ŽELEZNIK, Poročilo o čiščenju in restavriranju Quaglievih fresk in toniranju ostalih ploskev stolnice sv. Nikolaja v Ljubljani, 15. februar 1948: Archiepiscopal Archives Ljubljana (NŠAL, ŽA, Ljubljana – sv. Nikolaj, fasc. 26, spisi – razno).

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μPDSM 4.30: μPDSM, Micro Powder Diffraction Search Match, Release 4.30.

Sources of the visual references

Giuseppe Bergamini,

Giulio Quaglio, European painter

Figure 1: **photo: Elio Ciol, Casarsa della Delizia 1994**

Figures 2, 3, 4: **photo: Riccardo Viola, Mortegliano 1998**

Figure 5: **Archivio fotografico Egger, Museo diocesano e Gallerie del Tiepolo Udine**

Figures 6, 7, 12, 13: **photo: Marjan Smerke, Ljubljana 1994**

Figures 8, 9, 14: **photo: Giuseppe Bergamini, Udine 2000**

Figures 10, 11: **photo: Enrico Palmieri, Porlezza 2005**

Mateja Neža Sitar,

Ljubljana Cathedral and its wall paintings

Figures 1a and 2 (reproduction from: *Ilustrirani Slovenec*, 3, 1927, no. 10 and 4, 1928, p. 392); 1b and 3a (graphic artist: Elias Bäck) and 7a and 7b (two contracts from appendix): from Dolničar's *Historia* in **Seminary Library, Ljubljana** (2005); 3g (self-portrait in the presbytery of Ljubljana Cathedral) and 5b (2007): **photo: Valentin Benedik, © ZVKDS RC archive**

Figures 3b, 3c, 3d (all three scenes from *St Nicholas is elected Bishop of Myra* above the main entrance on the western wall of Ljubljana Cathedral): **photo: Rado Zoubek, 2004, ZVKDS RC archive**

Figures 3e (portrait, 69 x 56 cm without the frame, oil on canvas; from the **Benedictine monastery of St Peter in Perugia**); 7c (reproduction from: STESKA 1933 a, p. 120): **photo: Mateja Neža Sitar, 2006, ZVKDS RC archive**

Figure 3f (detail from self-portrait with a preparatory painting on canvas for the dome in San Ignazio, around 1680-1688, oil on canvas, 160 x 170 cm; inv. 1890, n. 1755) © **2011 Galleria degli Uffizi Firenze** with the permission of the Ministero per i Beni e la Attività Culturali (reproducing and copying in any form whatsoever or by any means is not allowed)

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Figure 4b: Internet source accessed on 3 August 2009: http://hanser.ceat.okstate.edu/3083/il%20gesu/il_gesu.htm

Figures 5a, 6a, 6b: **reproductions: Darija Mavrič** from: **MOSCHETTI 1931**, p. 23, fig. 362 and p. 19, fig. 358 and p. 24, fig. 363

Figure 5c: Sant Ignazio Ceiling, **photo: Bruce McAdam, under the Creative Commons Attribution-Share Alike 2.0 Generic (CC BY-SA 2.0)**; internet source accessed on 3 August 2009: http://commons.wikimedia.org/wiki/File:Sant_ignazio_ceiling.jpg

Figure 5d (pen and gray and brown ink with gray wash on two joined sheets of heavy laid paper; 50.4 x 91.2 cm; 1685/1690, gift of Robert M. and Anne T. Bass) © **2011 National Gallery of Art, Washington**

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Figure 9b: **reproduction from: KOLLER 1990**, p. 310

Figure 9c (the ceiling painting in the Bishop's Room in St Florian's monastery in Austria): **photo: Dr. Friedrich Buchmayr, 2007, © Stiftsbibliothek St. Florian**

Rado Zoubek,

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The history of the restorations of wall paintings

Figures 1, 10b left, 10c left, 10d left, 16a right, 16c whole and detail, 17a second on the right, 17a first on the right: **photo: Barbara Blaznik, 2006, © ZVKDS RC archive**

Figure 2a: **reproduction from: STOPAR 1996**, p. 12

Figures 2b (photo: Kristijan Pajer from *Dom in svet*, 1891, pp. 40–41), 6c (from: *Slovenski narod*, 27 June 1905), 6d (from *Laibacher*

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Figures 3a (portrait of Matija Medved by Matevž Langus, charcoal on paper, 19.5 x 16 cm; inv. no. NG G 1094), 4a (Matevž Langus, self-portrait, oil on canvas, 34 x 25.5 cm; inv. no. NG S 197), 11a: © **National Gallery of Slovenia (photographic archive), Ljubljana**

Figures 4b top (published in: STESKA 1904, p. 393), 5a, detail 15a of 5b, 5c, 5d (all photos: Janez Kotar) in 9b (photo of the document: Mateja Neža Sitar), 9c (photo of the document: Valentin Benedik): © **Archiepiscopal Archives Ljubljana**

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Figures 1, 3, 5, 8, 10: **computer simulations: Paola Korošec, 2007**

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