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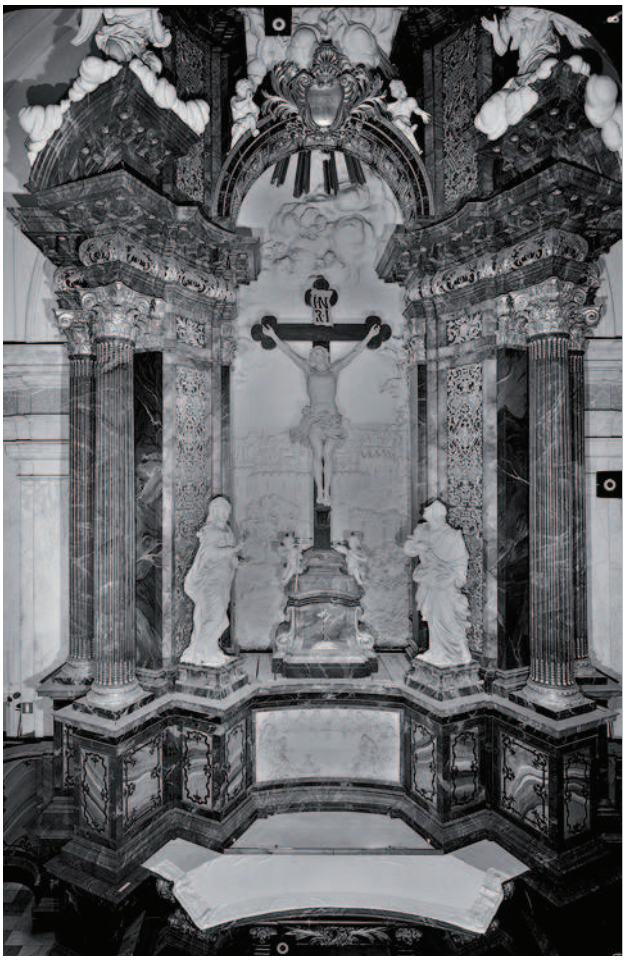
discovering the meaning and the making of a baroque altarpiece during tunnelling work

ABSTRACT

This paper presents an investigative approach for a baroque altarpiece and how it is used as a primary investigation source. This artwork was originally designed for Uppsala Cathedral between 1725 and 1731. An extensive tunneling project under its current location led to the altarpiece being investigated for the very first time. The investigation was carried out leveraging a set of methods and complementing expert competencies. The interdisciplinary *in situ* examination revealed that it is a sophisticated modular system of wooden boxes locked with a wedge system. Treatments of the altar construction during the 20th century were repeatedly done without an understanding of and respect for the original construction scheme and baroque craftsmanship. Unfortunately, interdisciplinary investigations of building-related art in Sweden are still seldom carried out for informed conservation decisions. This reinforces that it is time to change the treatment-focused approaches in the Swedish conservation process and adapt an investigative and reflective approach.

Keywords:
documentation
baroque altarpiece
Burchard Precht
technical art history
forensic investigation
conservation management

1. Frontal view of the altarpiece in Gustaf Vasa church in 2007. Photo: Fokus GmbH Leipzig.



2. The concave-shaped ground form of the altarpiece. Photo: Fokus GmbH Leipzig.

INTRODUCTION

This paper elaborates on experiences from an interdisciplinary investigation of the altarpiece in Gustaf Vasa Church in Stockholm. The paper highlights an investigative approach using the materials and construction of an altarpiece as the primary investigation source. Beside this, the paper discusses specific management aspects in interdisciplinary investigations related to artefact studies and conservation.

The construction and materials used in Sweden's largest baroque altarpiece have been unknown for almost 280 years. During an extensive tunneling project under Gustaf Vasa church, the altarpiece was investigated for the first time ever. Unfortunately, little archive material was available and could not provide any facts about the construction and materials used in the altar over time. Beyond this, treatments on the altar have been undertaken during the 20th century, but no conservation reports were available. This limited state of documentation complicated the condition statement of the altarpiece as well as the risk assessment related to the tunneling work under the church.

As a result, an interdisciplinary team of conservators, engineers, art historians, wood craftsmen and vibration experts had to examine the altar *in situ* from the inside and outside.

The assignment was to identify, evaluate and, if needed, mitigate risks related to the altarpiece during the tunneling work. This was achieved by tracing how it was originally constructed, to which extent alterations have been carried out and how these have had an impact on its current state of preservation.

THE ALTARPIECE

The altarpiece is a three-dimensional free-standing construction, accessible from both the inside and the outside. The construction is substantially self-contained with a considerable size of approx. 15,5 x 10,0 x 4,5 meters. This structure also includes two sculpture groups, situated in front of the main construction.

The lowest architectural parts, base and the overlying predella are placed in a concave segment-shaped form, which contributes to the depth effect. The altarpiece is created through an interaction of different materials such as wood, stucco and paint. Together this conveys an image of perspective and illusionary effects.

The altar base is fronted with an altar table and above this is a stucco relief depicting the Last Supper. The columns and pilasters rest on the predella, framing the scene of the Crucifixion accompanied by Mary and John in the aedicula of the architecture. Behind the Crucifixion, directly on the choir wall, is a scene of Holy Jerusalem. The upper part of the altar depicts the Holy Spirit through a dove in a stucco cloud surrounded by putti and light rays.

This baroque artwork was originally designed for Uppsala Cathedral by the court sculptor Burchard Precht's workshop between 1725 and 1731 (Rossholm Lagerlöf, 2007, p.191). Around 1885, the altar was considered improper in the gothic Cathedral in Uppsala and was dismantled, followed by fifteen years of storage under bad circumstances in Nordiska Museet, Stockholm. In 1905, it finally got a new place in Stockholm in the neo-baroque church Gustaf Vasa. Its history of reception makes it even more significant. The altarpiece represents one of the most significant sacred baroque art works in Scandinavia.

METHODS

As no documentation and archival sources were available, a forensic [1] approach was applied, i.e., the altar material itself served as the primary source. This approach was necessary to understand the original construction scheme as well as the extent of and causes for alterations. The findings regarding the original construction were captured separately from later alterations. The execution process of the altar parts was traced through using endoscopes, site microscopes, ultra velocity measurements and multispectral imaging. Besides this, methods such as photogrammetry, stereo-photographing, calculation of weight, monitoring and movement measurements of the altar structure were used and played an important role for the outcome.

By leveraging dialogue and structured thinking methods, the findings could be set in a cause and effect relationship. This dialogue between the involved experts was based on convergence and divergence thinking (Thompson, Brajkovich 2003, p.98-99). The dialogues connected to this investigation involved different experts in the field of conservation as well as mechanical engineers and vibration experts.

NEW QUESTIONS – NEW THINKING

The construction scheme of the altarpiece is a complex system. A uniform and structured investigation is essential for efficiently capturing and critically interpreting findings. A pre-condition for this is to first depict the altar systematically from its different sides, angles and views through photo documentation with both a mid-format camera and a photometric camera. Based on this, an initial understanding of its shape and dimensions could be reached. Photographs and drawings became the base map for tracing and evaluating the construction, materials used and alterations.
For the assessment of risks, it is essential to have evidence-based facts regarding the altarpiece´s supporting system, attachment of the decorative features and their meaning. For risk mitigation, it was important to understand the causes of the current condition in relation to former treatments.

Usually, conservators become involved in interdisciplinary teams due to the need of remedial conservation. In this case, the aim was different – to ensure that the altarpiece maintains its current status through a preventive approach focusing on indirect measurements. A new way of thinking was needed for the conservators in the team. The project-integrated dialogues based on convergence and divergence thinking were a very important aspect to manage the team and the stakeholders in a relevant and efficient way.

THE CONSTRUCTION

WOOD CONSTRUCTION

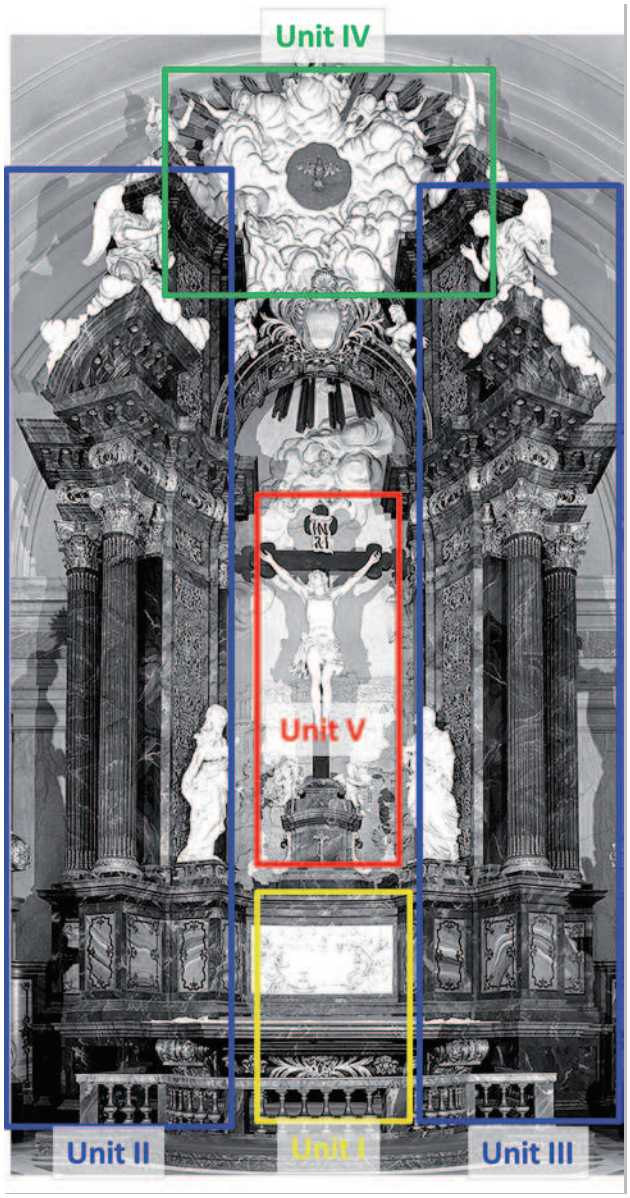
The altar consists of a system of units built up of modules. Each module consists of wooden boxes in a frame and filling system. Unit I is located in the middle of the base and predella, between unit II and III. Unit I carries the cross construction (unit V). This module is a frame construction in a vertical and a horizontal direction with an upper and lower section.

Unit II and III are the two main parts in the architecture, framing the scene of the Crucifixion as well as carrying the arch. These central units are self-contained and built-up in a concave shape by modules placed beside and above each other to reach the height of approx. 14 meters. The modules have probably been manufactured in a workshop and transported into the church. At the site, the modules were positioned and

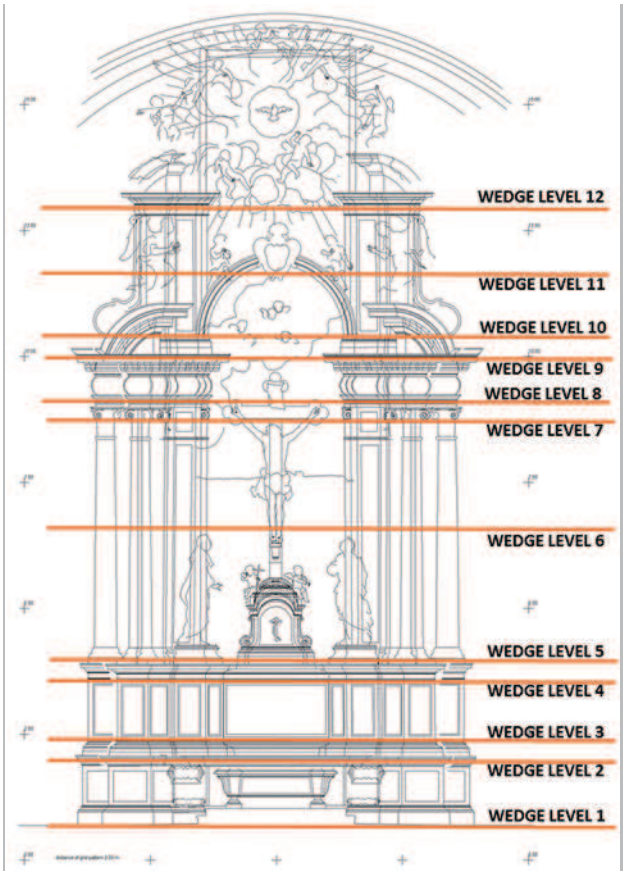
finally horizontally stabilized in a locking system through wedge units with a frame made of pine and wedges made of oak. According to the baroque tradition of craftsmanship, these locking systems with wedge units were originally located in the top and bottom of all modules.

Each of unit II and III in the altarpiece consists of seven wooden box modules (in height) locked together through 13 horizontal frame systems by a keyed mortise and tenon joint. Units II and III are aesthetically tied together by the arch, but without any real constructive function or unifying effect due to alterations in the original construction during the 20th century. The undertaken survey discovered a preserved locking construction of frames and wedges on 13 levels over the height of the altar units II and III. This means that there must have been seven levels of wooden modules in a vertical direction available to create the height of unit II and III. Further, this led to the need of about 38 box modules for these central units in the structure.

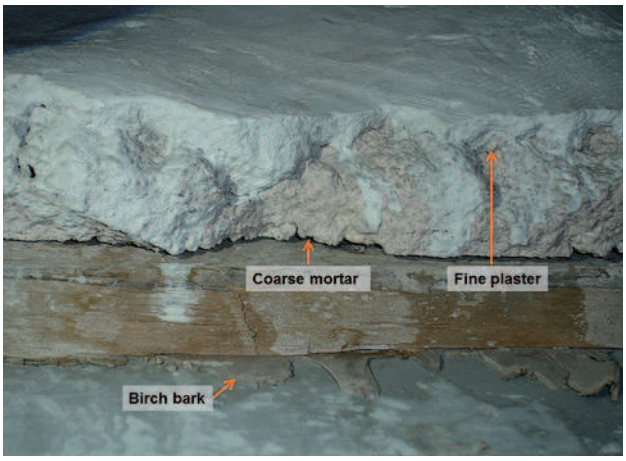
The upper part of the altarpiece, unit IV, is a cloud of stucco mounted on a wooden framing system. This unit is the only unit in the construction that is connected to the wall and carried by the masonry through four iron beams. The stucco cloud is applied by freehand modelling and built-up of different plaster layers to achieve its shape. The surface character of the putti figure in the cloud suggests that parts have been



3. The location of the five constructive units of the altar structure. Photo: Fokus GmbH Leipzig.



4. The location of the wedge levels in the modules. Photogrammetric drawing: Fokus GmbH Leipzig.



5. Layers of mortar, plaster and birch bark used in the creation of the stucco elements. Photo: Anna Henningsson.

6. Details of original preserved paint of a marble imitation on the back side of the altar. Photo: Anna Henningsson.

pre-cast in molds and then fitted into the cloud. After that, details were added by freehand modelling.

Unit V, the cross with a figure of Christ in stucco, is resting on unit I.

WOOD DETAILS

The four columns as well as their decorative features were created in a modular system. The column shaft is hollow and consists of six pieces, each with a height of 43 cm. The column shaft parts are fixed with four round wooden plates and secured with wooden dowels. Small modules are also used to create the capitals and bases of the columns. These carved parts are attached to the column shaft with wooden dowels. This investigation shows that one column with its decorative features consists of up to approximately sixty wooden parts manufactured by sawing, planing and carving.

STUCCO ELEMENTS

Stucco sculptures are attached and inserted into the wooden construction mainly by a vertical wooden stick that goes through the whole sculpture center and into the supporting system of modules. The cores of the sculptures are added to the vertical wooden stick in a horizontal direction using wood or metal reinforcements.

The figures are a combination of precast parts and freehand modelling (for example, the robes). Precast parts became integrated in the structure and completed by freehand modelling at site. An interesting finding in the sculpture construction is that between the wood construction and the stucco material, a layer of birch bark has been added. On this birch bark, a coarse mortar was applied to give shape to the figures and the cloud. A second fine plaster layer containing fine aggregates of sand was applied over the coarse mortar. The fine aggregates of this second plaster enable careful modeling of fine details such as hair and folds in the drapery.

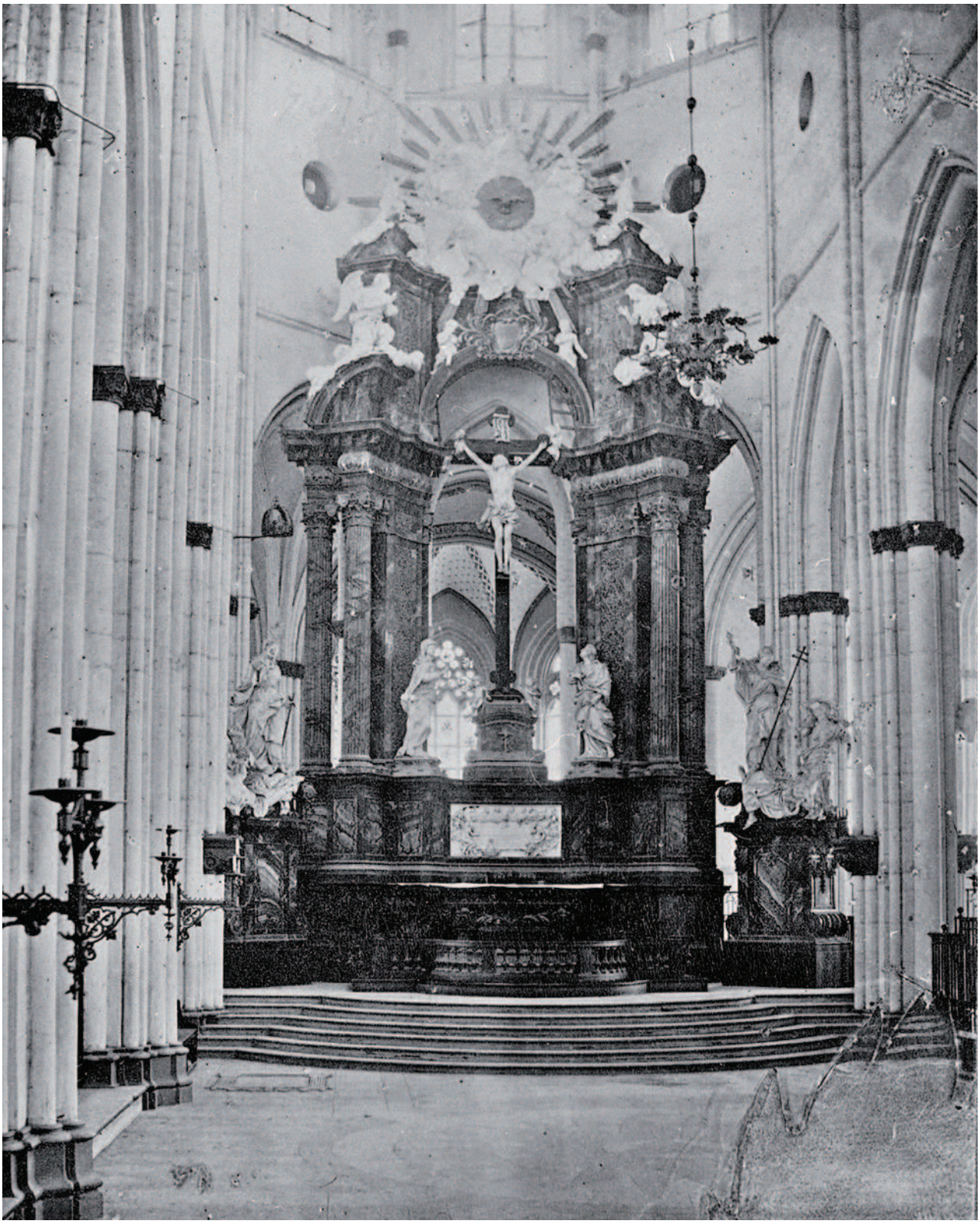
THE SURFACE

The wood is painted to imitate various types of stone in colours of red, brown, green and blue. Carved wooden ornaments are provided with layers of unidentified metal applications, this was in order to imitate metal and enhance lighting effects, as was highly desired at the time that the altarpiece was created. Most of the backside of the altarpiece has its original marble-imitating paint well preserved. Different layers of white surface treatments from different times cover the stucco in the altarpiece.

VISIBLE AND INVISIBLE ALTERATIONS BETWEEN 1885 AND 1975

The reconstruction in 1905 did not follow the sophisticated original baroque craftsmanship and lacked awareness regarding how the original construction added the modules to a static unit. Maintenance was carried out in a similar manner during the 20th century, i.e., without an understanding of the specificities in this 18th century construction. This caused additional alterations in the baroque construction, which further complicated the understanding of the original construction.

In order to evaluate how alterations have affected the stability, the object's cultural significance as well as to position the altarpiece in context of sacred art history, it was necessary to develop a deep understanding of baroque craftsmanship.



7. The altarpiece on its original location in Uppsala cathedral before 1885.
Photo: unknown photographer, from archive at National Heritage Board, Stockholm (ATA).

From the outside, only a few alterations to the altar are visible. The major alterations have been made inside the altar, which has impacted the whole construction. This has been ongoing for almost a hundred years. A visual comparison of archival photographs shows that the lowest part of the base, as well the uppers parts, the rays in the cloud, were sawn off in 1905, when it was realized that the altar was too high for the choir in Gustaf Vasa church. In Uppsala, the cross was positioned in line with the entablature. In the Gustaf Vasa church, it was shortened and given a lower position in the arch (compare fig. 1. and 7).

By observing the altar from the front, it is clear that the base has been lowered; this has extensive consequences for the structure. The first constructive frame sections of the lowest module box have been eliminated. In particular, the entire lower frame construction in the middle of the altar (Unit I) was affected.

A MISSING LOCK SYSTEM

The in situ examination revealed that the 20th century treatments did not use the original locking system of frames, wedge mortises and tenon joints. Instead, the wooden parts were nailed and screwed into bearing and dormant parts without any respect and understanding of the baroque construction. The initial survey in 2008 reveals that 93% of the locking wooden wedges were missing. Additionally, extensive parts of the frames in the modules were absent.

Moreover, unit I and its higher frame construction were originally integrated in the cross construction. Traces in the base of the cross indicate that it was integrated in the higher frame of unit I. However, in the 1970s, the cross beam was screwed into unit I without taking the advantages of the original constructive securing system into account. It is interesting that only forty years ago, the understanding of the benefits and values of the original structures was neglected and once again, treatments were made without respect to the original craftsmanship.

HIDDEN SOLUTION FOR MERGING UNITS

The original horizontal constructive connection between the two 14-meter-high units II and III is missing. The free-standing units II and III are not connected to the wall behind. The shortening of the vertical cross beam, followed by a re-positioning (lowering) of the entire cross, resulted in the original technical solution for merging unit II and III in a horizontal direction; thus, supporting the self-contained system being neglected.[2] Studies of photographs from the end of the 19th century indicate that a horizontal stabilization between these units was positioned behind the crossbeam of the cross. Further, the deviation in the frame-wedged system at level 8 and 9 indicates a possible former horizontal stabilization of the two units in conjunction with the cross. [3] Today, a wooden plank above the arch on the backside of the altar is aimed to replace the original horizontal connection between units II and III.

TRACING THOUGH MONITORING

The tunneling work under the church was accompanied by a two-year monitoring programme based on the initial investigation results. The monitoring was a combination of continuous measurements of vibrations and visual inspections. Monitoring is an opportunity for deeper understanding of the structure of historic artefacts and the causes of their deterioration: for example, the continuous measurements of vibrations over the years made it possible to correlate movements in the different altar units to specific alterations and patterns of deterioration in the structure and its surface.

DISCUSSION OF RESULTS

The in situ examination with the altarpiece itself as the primary source revealed that it is a sophisticated modular system of wooden boxes that gives it a shape of depth and perspective. A secure construction of these modules is reached through keyed mortise and tenon joints as the locking system.

The way alterations to the altarpiece have been carried out is a reflection of how it has been valued as art and historic crafts piece over the course of time. The rebuilding of the altar in 1905 was done without an understanding of or respect for the original construction scheme. In addition, this approach of treatments has been repeated during the three conservations carried out between 1935 and 1975. The examination that has been undertaken, followed by a multi-year monitoring programme has made it possible to trace how the altar components behave in their current environment. This could only be achieved through understanding its original purpose and the impacts of former treatments over time.

The undertaken investigation, which was performed by an interdisciplinary team, led to new facts that could not have been discovered if a team included only conservators. But what do we mean by an interdisciplinary approach and what is our understanding of it? Is it reached by adding conservation science to a project? A general definition of "interdisciplinary" is that it involves combining two or more approaches, ways of thinking or methods within a task or a project. The aim is to combine different disciplines to something new by crossing boundaries and thinking across them.

8. A wedge mortise and tenon joint (blue colour) on a frame of a module inside the altarpiece. Photo: Disent AB.

Combining experts with different perspectives requires a management approach focused on the artefact and its context. An interdisciplinary approach in conservation raises the question as to how and what to manage? A quick look back at conservation history shows us that the role of management can be more essential than we are aware of. Thus, merging different methods and perspectives to interdisciplinary work are opportunities and risks at the same time. This investigation was aware of this risk and integrated an elaboration on convergence and divergence thinking. The use of applied critical thinking methods turned out to be one of the most fruitful ways to reach the overall objective.

CONCLUSION AND OUTLOOK

In Sweden, interdisciplinary investigations of art in churches or profane buildings takes place very rarely in the conservation process. As a consequence, decisions for conservation are not taken based on facts. To preserve the cultural heritage, it is key that decisions are taken based on facts and that there is time to reflect on short- and long-term effects of possible treatments. Interdisciplinary investigations before conservation treatments of building-related art in Sweden are an underestimated resource for creating strategies for informed conservation decisions.

It is time to change the treatment focused approached in the Swedish conservation process regarding building-related art and adapt an investigative and reflective approach. This shift would allow us to understand values of material and intangible characteristics. This approach was already introduced in Sweden at the end of 1970s and presented at the Nordic Association of Conservators Congress 1981 held in Oslo (Tångeberg, 1981, p. 79-81). Unfortunately, the discussed approach is still not common practice in the Swedish conservation process. Reintroducing this approach would help us pass the culture heritage into the future in a sustainable and meaningful way.

ACKNOWLEDGEMENTS

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NOTES

[1] Forensic methods and the collection of evidence are described by Almevik, 2012, p. 63; referring to Weaver, who introduced the forensic approaches for the build heritage.

[2] These parts of the altar construction still need supplementary examinations to make any final conclusion regarding the baroque manner to solve this constructive task.

[3] There is still a need for deeper investigation regarding the frames and wedged system in level 8 and 9 as well as on level 12 and 13. In these levels in the wedged system, the alterations have been very extensive over time and an extended examination of negative traces in the structure on this level is required to establish and finally verify this assumption.

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