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The detached wall paintings from the attic of the monastery church St. Johann in Müstair in the collection of the Swiss National Museum – research and development of a conservation and restoration concept

by NATALIE ELLWANGER, TIZIANA LOMBARDO, PATRICK CASSITTI, CAMILLA MARTINUCCI, ALBERTO FELICI, MARTA CAROSELLI, MARKUS LEUTHARD and RUFINO EMMENEGGER

Introduction

Since 1908/09 the Swiss National Museum has been in the possession of 28 detached wall paintings¹ (20 pictures transferred to a textile support, called *strappi*, and eight transferred to a rigid support, called *stacchi*), originating from the Benedictine Monastery St. Johann in Müstair/GR (Fig. 1). In 2015, four Romanesque wall paintings were to be lent to the Müstair Monastery Museum. In the course of selecting the objects, representatives of the Swiss National Museum and the Stiftung Pro Kloster St. Johann met to view the collection of wall paintings removed from the monastery in Müstair. It was deter-

mined that the *strappi* in particular were in a delicate and visually severely impaired condition. Between 2016 and 2019, SNM staff, a freelance conservator and staff and students from the Scuola universitaria professionale della Svizzera italiana (SUPSI) examined all 28 objects, created mappings and drew up a priority list for conservation purposes. There proved to be an urgent need for intervention on 90% of the objects. The first emergency conservation measures were carried out by the SUPSI conservators.² At the same time, a project was launched to develop a conservation concept and a proposal for the subsequent implementation of conservation and restoration treatments.

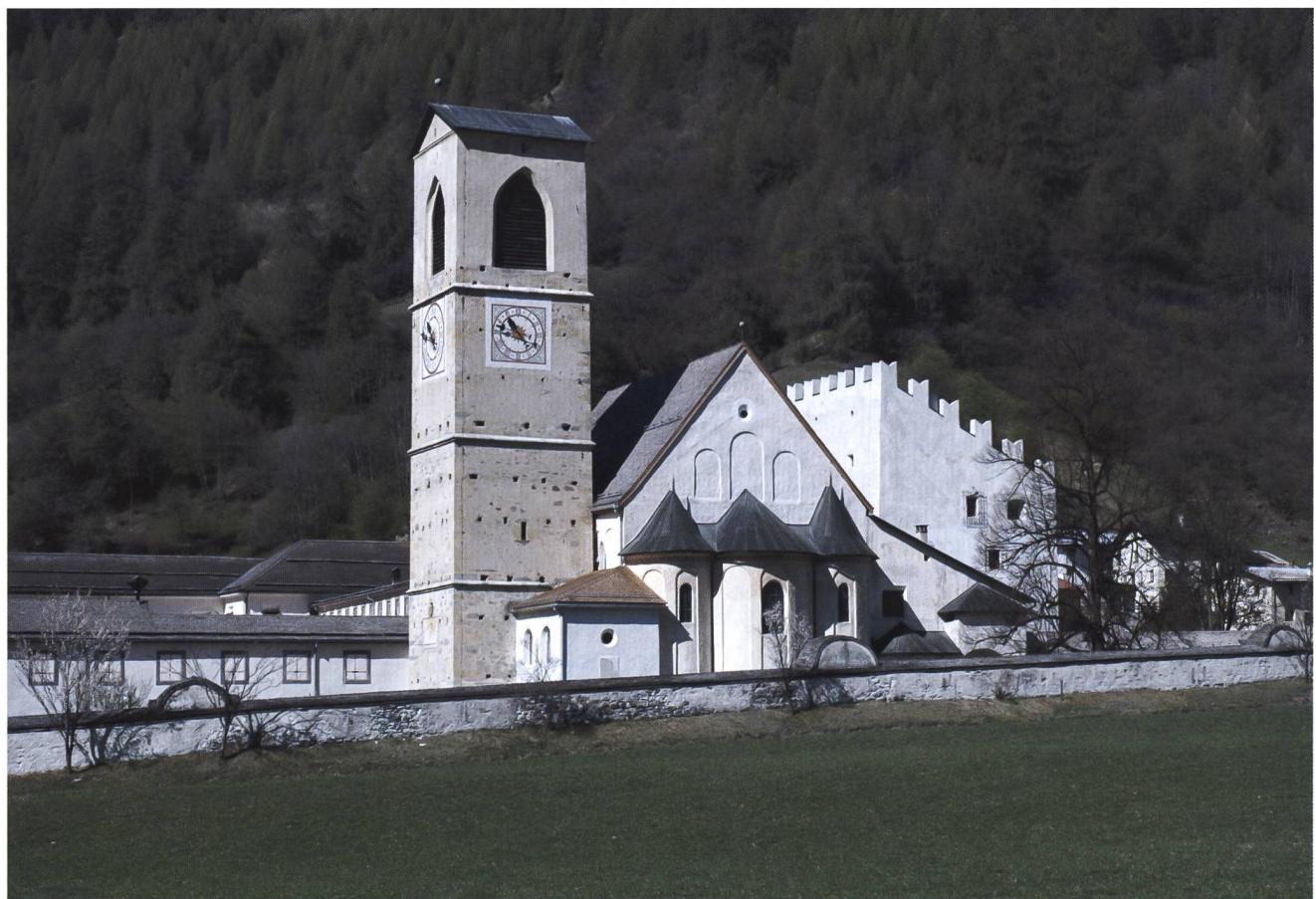


Figure 1. Monastery Church St. Johann in Müstair.

The Constitution of the Project

The planned research and project development required interdisciplinary cooperation between conservation science, conservation-restoration, monument preservation, art history and architectural history. The work had the potential of yielding a considerable improvement in knowledge for these disciplines with regard to the history of the objects, the painting technique and the state of conservation. The project was therefore initiated and carried out jointly as a cooperation project between the Swiss National Museum (SNM), the Scuola universitaria professionale della Svizzera italiana (SUPSI) and the Stiftung Pro Kloster St. Johann (SKSJ). The work of the project team was accompanied by an expert advisory board consisting of Heidi Amrein (SNM), Patrick Cassitti (SKSJ), Andreas Franz (freelance conservator-restorer), Giacinta Jean (SUPSI), Christine Keller Lüthi (SNM), Werner Koch (Prof. FH Potsdam) and Hans Rutishauser (former Monument Conservator Canton Grisons).

The project was designed in two phases, each with the following objectives.

- Phase 1: consisted of five work packages (WPs),³ exploring the history, carrying out scientific investigations and analyses, developing a concept for the conservation and restoration measures with the primary aim of stabilising but also restoring a visually satisfactory, legible and aesthetically homogeneous appearance for the SNM group of objects. Research into the traces of the detaching process and the unrestored remains of wall paintings in the attic of the church of St. Johann would also be carried out. Phase 1 was completed in August 2021.
- Phase 2: will include the implementation of the measures defined in the conservation concept and the digital and photographic reconstruction or completion of the missing parts, the latter for Müstair as well as for the SNM objects.

A Brief Historical Outline of the Müstair Wall Paintings before Detachment

The Benedictine monastery of St. Johann in Müstair has been a UNESCO World Heritage Site since 1983. The Carolingian wall paintings from around AD 800, which originally covered the entire height of the church interior, are particularly critical for this designation. The cycle of paintings was partially painted over around 1200. In 1488–1492, the church underwent fundamental architectural changes and was converted from a Carolingian hall church into a three-nave hall church and, among other things, was provided with a vaulted ceiling. The vaults still cover the painted top register (Fig. 2), which thus disappeared from sight and gradually fell into oblivion.⁴

From 1894 onwards, Josef Zemp and Robert Durrer carried out art topographical surveys of the entire monastery complex on behalf of the Society for the Preservation of Historical Art Monuments. In the course of this activity, they rediscovered the paintings in the attic and executed several watercolours of them.⁵ As a consequence of the rediscovery, Zemp expressed the wish to detach these paintings and exhibit them in the Landesmuseum in Zurich. It was argued that by removing the paintings, they could be exhibited in a climatically optimised environment and also made accessible to research and science. It was not possible for secular visitors to enter the attic, as access was through the enclosure. One must assume that Zemp had a great interest in the removal of the murals, since he had been responsible for the design and furnishing of the newly built Landesmuseum in Zurich since 1896 and was its vice-director from 1904–1912.

Between 1908 and 1909, 28 parts of the wall paintings were removed. Twenty parts of the Carolingian paintings were detached by using the *strappo* method (Fig. 3).⁶

Another eight parts of the wall paintings were detached by using the *stacco* method (Fig. 3). All but two of these were originally located in the church attic; during the course of the project it became clear that the remaining two (LM-11992.6 and LM-11992.7) could not have originated in their location in the church but must have been detached from the area above the vaults of the St. Nikolaus Chapel.⁷ All the detachment and transfer procedures were carried out by Carl Schmidt-Frey, Zurich.⁸

For a better understanding, the two ways to detach wall paintings are explained here in very abbreviated form.⁹ In both procedures, the wall surface is covered with two layers of fabric (facing). In the case of *strappo*, the adhesive is chosen to ensure that, during the drying,



Figure 2. Situation in the attic: east wall with the remains of the Carolingian wall paintings after the detachment.

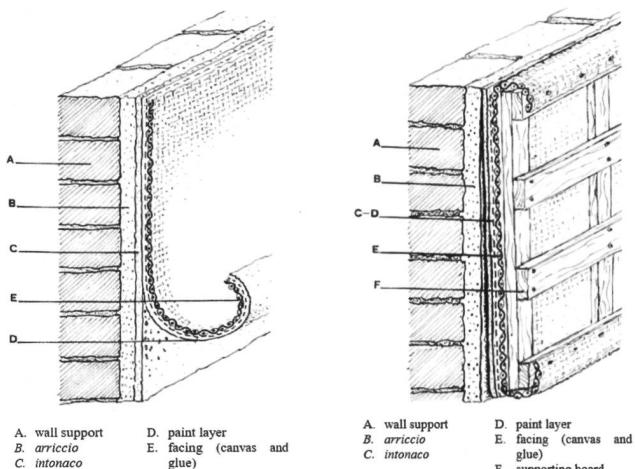


Figure 3. Schematic diagrams of the set-up for the strappo and stacco technique.¹

process the strength of its contraction and its shrinkage is stronger than the adhesion of the paint layer so it can be removed. After drying, the fabric and the layer of paint can be stripped off the wall like skin. Occasionally, parts of the *intonaco* (render) are also detached, which is not desirable. The detached painting is then transferred to a textile support. After this the facing will be removed. In the *stacco* process, the adhesive should not shrink during drying. By hammering and beating the surface and mechanical manipulation, a thicker layer of *intonaco* is detached from the wall and then transferred to a rigid support.

Critical Reflection on the Detachment of Wall Paintings

This technique of removing wall paintings has existed since antiquity.¹⁰ Afterwards, the knowledge fell into oblivion for several centuries until it was taken up again on a grand scale in the 18th century. The excavations in Pompeii and Herculaneum can be seen as the catalyst.¹¹ In Switzerland, as well as in the rest of Europe, its popularity as a conservation practice increased at the end of the 19th century¹². In particular, in Italy, the detachment of wall paintings played a significant role in the history of restoration; over time, it was progressively perfected and represented a point of reference for the whole of Europe. Two fundamental manuals were published in this country in 1866, which long constituted one of the most complete and important instructions for restoration in the 19th century: the *Manuale ragionato per la parte meccanica dell'arte del restauratore dei dipinti* by Giovanni Secco Suardo from Bergamo and the *Manuale del pittore restauratore* by Ulisse Forni from Florence. In part 1, chapter III of his *Manuale ragionato*, Secco Suardo describes in detail the history of removing wall paintings from their beginnings to the 19th century. He discusses the detachment of murals executed in

different techniques and how the removal should be carried out depending on the painting technique. He examined many *strappi* and divided them into good, mediocre and bad executions. He reported on a few murals where the transfer process obviously went wrong. He described them as rough, heavy, hard and brittle and all of them were warped.¹³ The damage described is similar to that found on the wall paintings removed from Müstair. In the course of the 19th century, the enthusiasm for wall painting detachment spread throughout Europe.¹⁴

The removal of the wall paintings from the Müstair monastery and various other sacral and secular architectural monuments in Switzerland, which are now in the possession of the Swiss National Museum, also took place during this period. Most of these objects are currently in a questionable state of conservation and appearance, partly due to the fact that they have been detached and because of the alteration due to aging of the new implemented materials. The transformation of a formerly rigid wall painting consisting of inorganic materials into a more flexible, canvas painting with a wide range of organic materials must inevitably lead to change and damage. From today's perspective, the removal of wall paintings must therefore be judged very critically. This measure does not contribute to an improvement in the state of conservation and thus Zemp's method of choice unfortunately did not contribute to a better preservation of the detached wall paintings from Müstair.

Exhibition and Conservation-Restoration History of the Detached Wall Paintings

Archive and Literature Research

Between October and December 2019, the archive and literature research were carried out by the art historian Thomas Zweifel. The Swiss Federal Archives of Historic Monuments EAD, the Bauarchiv Müstair BAM and the archives of the SNM in Zurich and Affoltern am Albis were consulted. The information from the archives of Christian Schmidt Malermeister AG,¹⁵ the Central Library Zurich, the Episcopal Archives Chur, the University Archives of ETH Zurich and the Abbey Archives Engelberg were also researched.

The archival research at the Federal Archives of Historic Monuments EAD brought to light a photograph showing a fragment of a wall painting from the attic of the monastery church of Müstair before its detachment in 1908. It depicts a scene on the northern wall from which the objects LM-11991.2-3 were detached (Fig. 4).

Past Conservation-Restoration Treatments in Relation to the Exhibition History

The 1910 annual report of the Landesmuseum mentions that a conservation specialist named Odger Roust lined the *strappi* onto second canvases and mounted them on

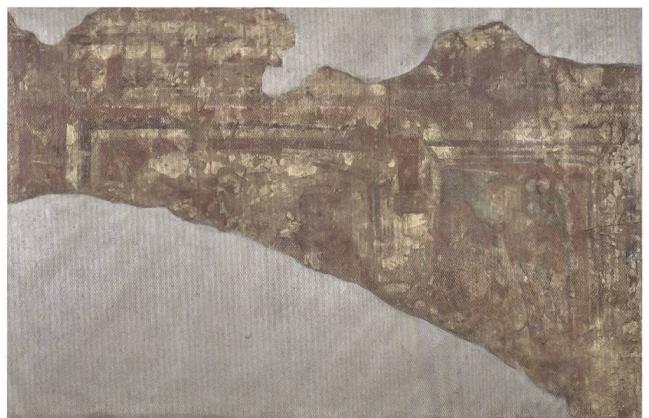


Figure 4. Picture taken from the north wall: Absalom is led by Joab to David [upper figure left side], and: Absalom steals the hearts of the men of Israel [upper figure right side] in the attic of the monastery church Müstair before the detachment in 1908; and corresponding objects in the collection of the Swiss National Museum. LM-11991.2 (bottom, left) and LM-11991.3 (bottom, right)

solid stretchers.¹⁶ Presumably also at this time the large areas of missing paint layer and open surfaces, which can be attributed to the areas covered by the gothic vaulting, were filled in with imitation plaster (infill). From subsequent reports and conservation documentations, we learn that the treated objects had been elaborately retouched.

There is no clear evidence of who executed the retouching; it could have been either Odger Roust or Carl Schmidt-Frey. However, the annual report of 1910, reports that Zemp participated in the conservation work. Dione Flühler-Kreis¹⁷ suggests that the retouching may have been based on the watercolours by Zemp and Dur-

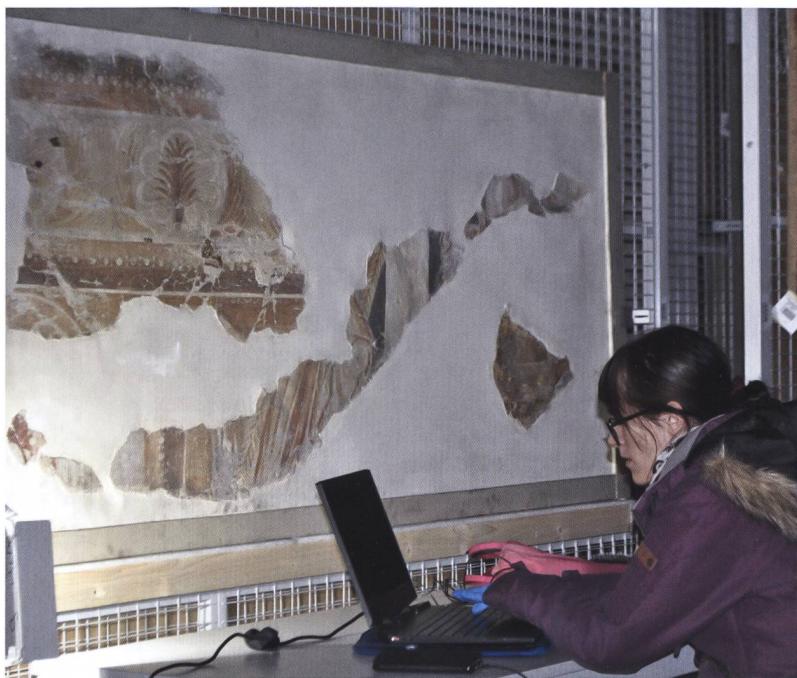


Figure 5. Examination and mapping of the Romanesque painting LM-11995.1 in Affoltern am Albis.



Figure 6. Examination and mapping on the east wall in the Müstair attic.

rer.¹⁸ The measures described were carried out to prepare a selection of 10 *strappi* for presentation in the Landesmuseum. The Carolingian paintings were integrated into the archaeological exhibition. The fact that the paintings were integrated into the archaeological exhibition may seem strange, but it has been argued that, from an art-historical point of view, they are to be placed in the context of the succession of Roman antiquity.¹⁹

At which point after the detachment, the *stacchi* were transferred to a gypsum plaster bed is not documented. By contrast to the *strappi*, a retouching of the *stacchi* was not necessary because they were very well preserved.

In 1936, ten unspecified *strappi* were restored for a new presentation in the former school of arts and crafts wing of the Landesmuseum. According to an invoice, 10 *frescoes* were cleaned and loose plaster was fixed.²⁰

In 1965, two *strappi* (LM-11991.6+8) were conserved and restored before being lent to a major Council of Europe exhibition “Karl der Grosse” in Aachen. The task was to remove the old retouching and reveal the images. Here, the reduced condition of the paintings after detachment and previous restoration treatments became apparent and was officially noted.²¹ During the 1960s, further treatments were carried out on individual objects. The most invasive of these was the division of LM-11990.4 into two pieces.

In the 1970s, restorers worked on five *strappi* (LM-11990.1–4a and LM-11991.7), stabilising loose paint layers, removing coatings and infills and applying new retouching and coatings. The way this was done appears

very drastic to us today and has potential for discussion. It is worth noting that the procedure and materials used changed in the course of the project.

During the 1980s and 1990s, the location of the group of *strappi* changed several more times. In 1995, they were integrated into the newly designed medieval exhibition. According to the records in 2008 the last five exhibited paintings (LM-11990.1–4a) were finally withdrawn from the permanent exhibition and placed in storage.

In 2015 four *stacchi* (LM-111995.3–6) were conserved by Rufino Emmenegger (SKJS) before being lent to an exhibition in the Monastery Museum Müstair.

Research and Documentation of the Condition

During phase 1 all research addressed the two object groups, the detached wall paintings as well as the *imprints*²² in the attic (Figs. 5 and 6). An extensive survey was carried out with the aim of gaining a better understanding of painting techniques and constituent materials (original and attributable to the detachment process or later conservation treatments) and to assess the presence of alterations.

Visual Glossary

A visual glossary was created to summarise and describe each phenomenon and feature observed during the survey. It was organised into thematic sections (original materials and techniques, *strappo* and *stacco* operations,

treatments, alteration of materials and other observations). At the same time, condition reports and maps were created for each painting in keeping with the structure of the visual glossary.

Comprehensive Photographic Documentation of Both Object Groups

To support investigation, mapping and documentation within the project, two different photo campaigns were carried out. All wall paintings that had been detached, as well as entire walls in the attic, were fully recorded.

Annette Keller, artIMAGING, Berlin executed multispectral photography. Conclusions can be drawn about the use of certain materials (pigments, coatings, etc.), which in turn serve as a basis for more specific measurements and sampling.

An example of a multispectral investigation is presented in Fig. 7.

Photogrammetric documentation was executed by Mr. Gisbert Sacher, fokus GmbH Leipzig (Fig. 8).

A rectified, high-resolution orthophoto was created for each painting in the possession of the SNM (Fig. 9). In the attic, each wall was captured in a single image. These orthophotos served as basis for the mapping carried out in WP2 during the documentation of the current state of conservation. An example of this is given in Fig. 10.

Condition of the Strappi

The twenty Carolingian *strappi* present a wide variety of conditions and alterations. In addition to the intrinsic characteristics of the paintings, e.g. the painting technique and the condition at the time of the detachment,

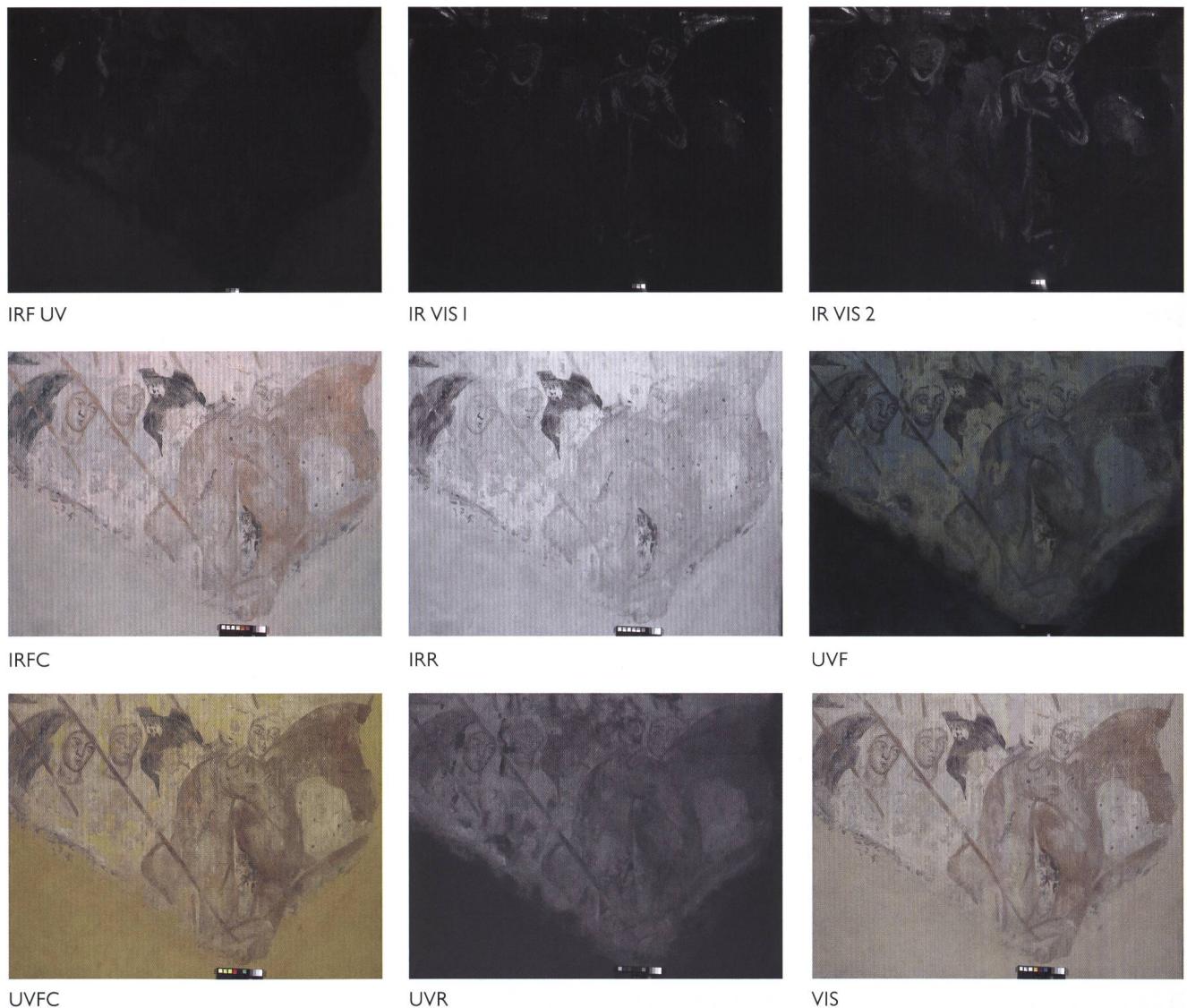


Fig. 7. Multispectral images from the same detail in LM-11991.6.



Figure 8. Setting during the photogrammetric photography in the SNM Collection Centre.

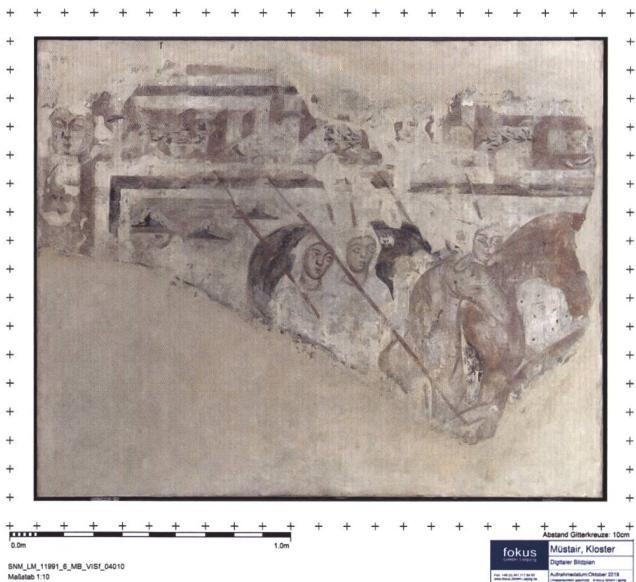


Figure 9. Orthophoto of LM-11991.6 Departure of David's Horsemen.

the main causes of this disparity are the detachment process and the subsequent conservation history of each object. The most obvious changes concern the visual appearance. In the course of past conservation-restoration treatments, some of the *strappi* had been provided with

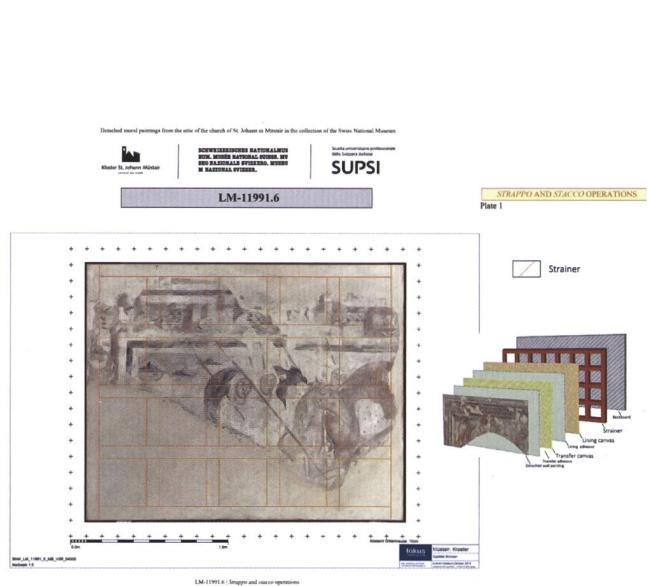


Figure 10. Mapping strappo and stacco operations of LM-11991.6.

coatings (Fig. 11). Over time, these have yellowed considerably, changing the colours altogether and preventing the observation of *secco* finishing.

Many *strappi* require closer examination to determine whether the render residues and the paint layers no longer

adhere to the textile support (Figs. 12 and 13). As a consequence, losses can be expected during any manipulation.

The *strappi* from the east wall were restored in the 1970s, at which time previous treatments were removed, and loose paint layers were comprehensively fixed. Presumably because of this last treatment, these paintings are in stable condition. The scenes are richly decorated, of high quality and the depiction is of importance (Fig. 14). Probably these were the main reasons why this cycle (LM-11990.1–4a) was chosen for extensive conservation treatment.

Another group of three objects (LM-11991.6–8) from the north wall also underwent extensive conservation and de-restoration treatments during the late '60s and early '70s. Their appearance today can be described as fragmentary (Fig. 15).

Condition of the Stacchi

Regarding the six Romanesque *stacchi*, the entire smooth and polished *intonaco* is affected by deformation and widespread cracks that could very likely have been caused by the detachment process. Cavities have been detected as well but their presence does not seem to be critical. As a rule, the paint layer has been applied with thin, transparent brushstrokes, but thick and opaque layers can also be observed. Most of the pigments appear to have been altered by fires that occurred in the attic over the centuries. In only two paintings (LM-11995.3+4), small areas, presumably protected from fire, present evidence of the former colouring (Fig. 16). The presence of residues of facing adhesives made of tree resin, has caused local flaking of the paint layer. Salt efflorescence was detected in several paintings (Fig. 16²³). It was not possible to identify a specific instability of the paint layer due to efflorescence, but salts could potentially represent a risk.

Comparison between the SNM and Müstair Groups

Comparative observations and in-depth study of the SNM paintings and the *imprints* revealed crucial correspond-

ences and evidence, leading to a better understanding of how the detachment process was conducted.

In addition the Zemp and Durrer watercolours²⁴ have been helpful to understand alterations, losses, and lacunae as well as repainted parts of the objects (Fig. 17).

Analytical Investigations

A two-phase analytical investigation was carried out during the course of this project. The aim of the analyses was to characterize the original materials (pigments and binders), those used during the detachment or for later conservation-restoration treatments, and the alteration products (mainly salt efflorescence).

Firstly, analysis was carried out using non-destructive techniques such as portable X-Ray Fluorescence (p-XRF) and portable Fourier Transform Infra-Red (p-FT-IR) spectrometry. Only when more information was needed, samples were collected and investigated in the lab using several further techniques.²⁵ The *in situ* non-destructive investigations were performed on the SNM objects (21 in total) as well as on the objects in the attic of Müstair church (15 scenes) (Fig. 18). The selection of the most significant areas to be investigated was made using the information arising from the multispectral images as well as the watercolours by Zemp and Durrer, and from the object survey carried out during the previous studies. Samples were mostly collected from the SNM objects (70 samples), and few from the attic (3 samples). Most of the samples are small fragments analysed with no preparation, but cross-sections were prepared for the specific investigation of painting techniques.

Great pains were taken to document the whole of the investigation very precisely, which resulted in the editing of several documents. These are now stored in the SWITCH repository²⁶ and are accessible for future use.

The interpretation of the results is rather difficult. The presence of several materials used for the detachment and for later treatments, as well as the difficulty of collecting



Figure 11. LM-11992.2 (Ark of the Covenant in Jerusalem) (left) with a yellowed coating in comparison to LM-11992.4 (King David and Nathan (?)) (right) presenting a different type of coating. The latter object is more brilliant and details are more visible.



Figure 12. LM-II991.2 Detail of brittle paint layer, which is only stabilised by the coating.

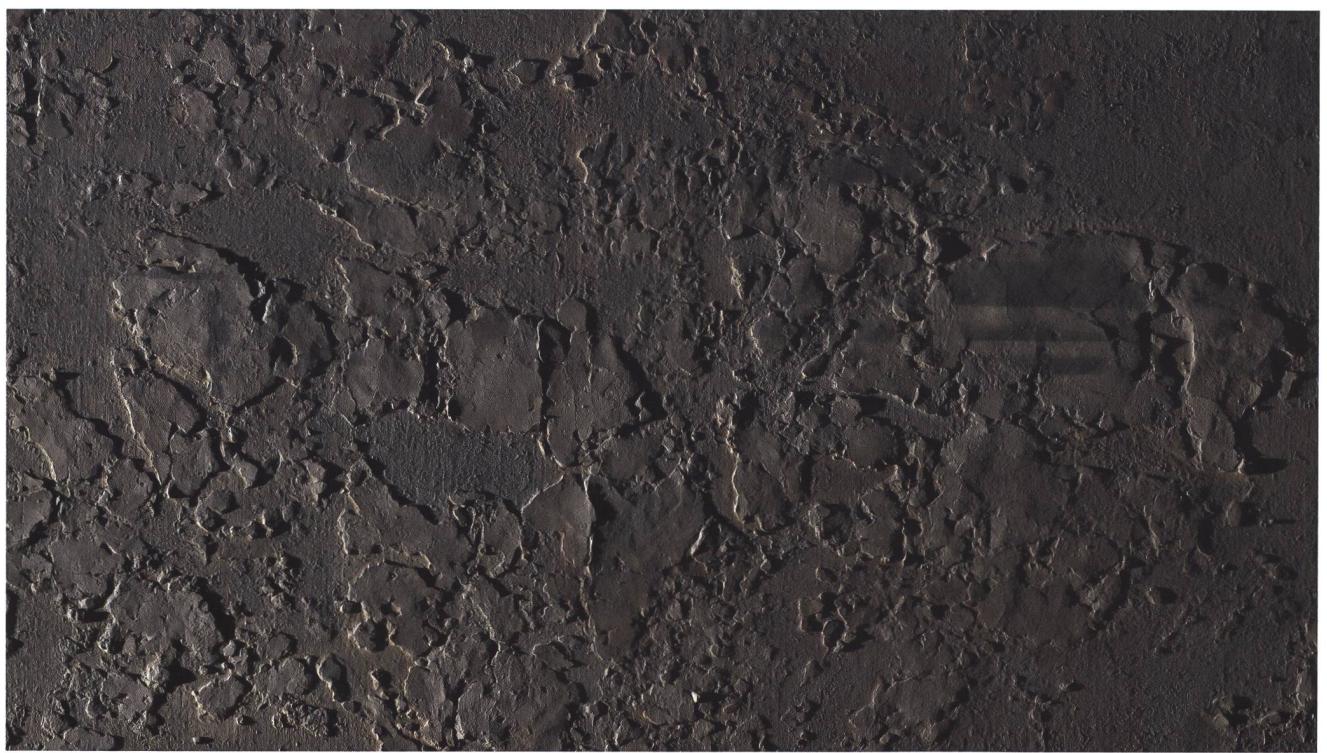


Figure 13. LM-II991.5 Detail in raking light. Paint layer, which is cracked, loose, lifted and contains cavities.



Figure 14. LM-11990.3 Ascension of Christ with Angels and Luna.

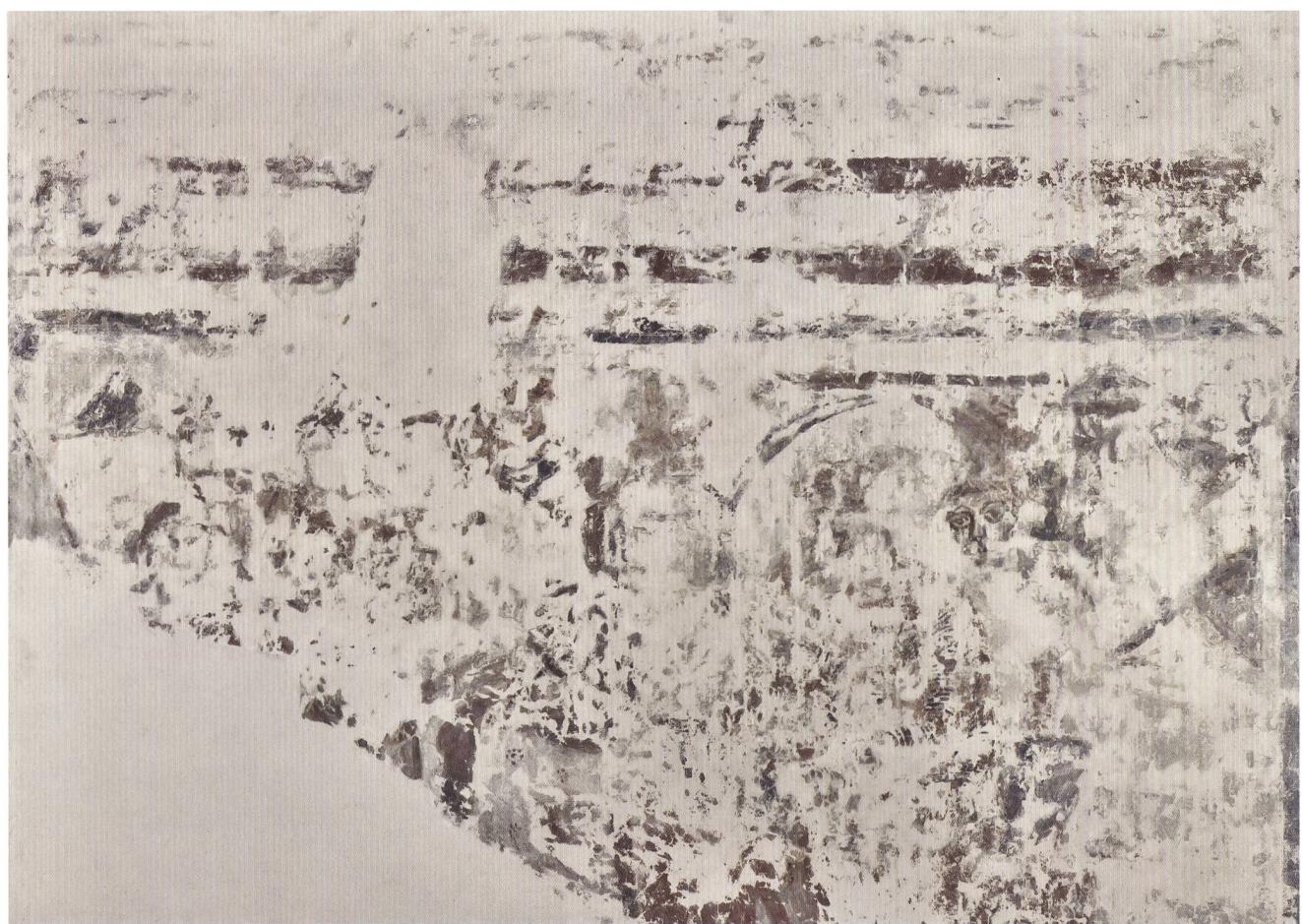


Figure 15. LM-11991.8 David Mourns for Absalom.



Figure 16. LM-11995.4 Romanesque painting (Cain's Sacrifice). Salt efflorescence and burnt/unburnt paint layers are visible.¹¹ The burnt pigments have turned to shades of brown whilst unburned they are still green, red and yellow.

samples from a specific layer without also gathering tiny parts of the underlying layers, are among the greatest challenges. For instance, it is well known that Carolingian wall paintings were executed with mixed techniques (use of *fresco* with *secco* layers), but it has been practically impossible to define the exact nature of the binders because of the presence of several other organic materials used for restoration-conservation whose spectroscopic signals interfere with the binder signals.

Additional important findings were provided by investigations of the different adhesives used for facing, transfer and lining. The residues of facing adhesives, collected in the attic, show the use of a proteinaceous material (not clearly identified), while the lining materials of the *strappi* present animal glue as the main component. The nature of the transfer adhesive is rather difficult to assess, even though several samples have been collected, but it seems clear that different recipes were used. It is very interesting to note that the transfer adhesive is usually charged with several different inorganic materials including different pigments, probably chosen to modify the visual appearance of different scenes or different areas in the same scene. In addition, the analyses allow the precise characterisation of several types of coatings and fixing materials and an extensive assessment of the different infills used on the

strappi. Indeed, four types of infill were identified, some of which present a complex stratigraphy. Substantial differences have been highlighted in material and technique between the Carolingian and the Romanesque painting cycles. While in the Romanesque paintings iron-based pigments are mostly used, in the Carolingian ones iron-based and lead-based pigments are present, either separately or in mixture, as well as lapis lazuli and *bianco di San Giovanni*. Finally, the analyses allowed the characterisation of salt efflorescence, most of which are mixtures of different salts (acetate; sodium-, calcium-, and magnesium sulfates; as well as carbonate). All the salt mixtures seem to be quite stable in the present environmental condition of the depot. Therefore, the efflorescence, which should be monitored, does not seem to constitute a real risk for the integrity of the objects.

Development of a Proposal for Conservation-Restoration Treatments

In order to develop a proposal, ethical principles first had to be defined. This was done in a large group together with the expert advisory board. The group agreed on the following principles:



Figure 17. Comparison of the Zemp and Durrer watercolour^{III} for the scene Mü-18 (above) with the strappo (bottom left) LM-11991.6 and the imprints in situ (bottom right).



Figure 18. Non-destructive analytical campaigns taking place in SNM Collection Centre and in the attic of Müstair church.

- The developed proposal should aim to preserve as much as possible of the history of the past interventions according to a value assessment and in particular to prevent putting at risk the original material of the paintings.
- The conservation interventions should aim to be minimal, that is, the intervention should be as minimal as possible but as much as is needed. The concept of “minimal” can vary greatly from one object to another. Therefore, a thorough value assessment needs to be carried out.
- Aspects of preventive conservation, such as monitoring and handling, should be included and proposals for any temporary stabilisation and paint layer fixing/protection for transportation, should these be needed.
- A model conservation/restoration measure should be carried out on one or two *strappi*. Based on the defined benchmarks, the feasibility and, if necessary, the further development of the concept should be assessed before a large, comprehensive restoration campaign is launched. Based on this, the cost framework can be extrapolated.

Developing a concept

Once agreement was reached on ethical considerations over the course of five days, the most urgent remedial measures were tested on selected objects. A whole range of materials such as adhesives and solvents were tested and found to be suitable or ruled out as unusable. Based on the results of the test days, the standards for conservation-restoration were set and the following measures identified.

All objects are quite dusty due to their long period of exhibition and storage. *Dry cleaning* of the surfaces front and back with soft brushes is the recommended minimal intervention. The *removal of coatings* is urgent above all from a conservation point of view. Aesthetically, there may be a visual alignment within the object group. There are several paintings in an unstable condition, which

require *intermediate stabilisation* of the paint layer in order to allow further handling and examination (Fig. 19). A large number of paintings have an extensive need for paint layer *consolidation*. During the tests and trials, several adhesives were tested and amongst those, a few were found suitable (Figs. 20 and 21). The *removal of infills* might be necessary for various reasons. For conservation purposes, there is the hope that the removal of the massive infill layers might have a positive impact on the deformed textile support along the edges of the paint layers. There are various approaches as to how these areas could then be dealt with. As has already been done in the past with the *strappo* LM-11990.1 and others, the shapes of the vaults and lacunae could be left as bare canvas. Alternatively, the infills could be *substituted* by designing the shapes of the vaults and gaps differently, be it in terms of colouring or structure. This decision will certainly have to be discussed. The *stretchers* are integral parts of the objects and should therefore be retained if possible. By adding rigid supports in combination with non-woven fabric (fleece) inlays, a reduction of vibrations can be achieved. As far as possible, the old retouchings should be preserved. Should the preservation not be possible for aesthetic or technical reasons, the extent and the method of *retouching* would undoubtedly need to be discussed before a new intervention.

Critical reflection of past and future conservation-restoration treatments

The performance of detaching the mural paintings has been critically assessed above and from today's point of view, this procedure should only be used as *ultima ratio*. The conservation-restoration treatments that were carried out on the *strappi* in the SNM's collection in the 20th century must also be critically evaluated. Apart from the influence of contemporary taste on the type of presentation, the measures were implemented with the knowledge and technical possibilities of the time. We are now faced



Figure 19. Example of an intermediate stabilisation. Detail of LM-11991.5, unstable portion of the original painting support before (right) and after fixing points have been made with Lascaux 498 HV (left).



Figure 20. LM-11992.2. fixing and readjustment of a complete detached flake carried out with few drops of EVA.



Figure 21. LM-11991.5. Picture of a flake before (left) and after (right) fixing with sturgeon glue.

with the difficult task of dealing with this heritage and, through our efforts, on the one hand guarantee the preservation of the paintings and on the other hand improve their aesthetic appearance to such an extent that they can be read and exhibited again. If the latter is not possible or only possible with massive interventions such as large-scale retouching, modern technical possibilities will help us to digitally supplement the only fragmentarily preserved remains. By means of modern media, we can convey content without having to further intervene on the original.

Perspectives

The findings, results, discussions and lessons learned from the five work packages of the project "*The detached wall paintings from the attic of the monastery church St. Johann in Müstair in the collection of the Swiss National Museum; Research and development of a conservation and restoration concept*" form the basis for the second phase of the project, which must be prepared and initiated. In particular, the planning of the conservation-restoration measures and the procurement of the necessary financial resources are very important, but challenging and complex. The main goal is to implement the conservation and restoration measures. In order to be able to prepare these even better, two objects are to be conserved and restored as model objects.

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NOTES

¹ GUIDO BOTTICELLI, *Metodologia di restauro delle pitture murali*, Florence 1992, p. 113.

¹¹ These different areas result from a fire. The unfired areas were probably covered by debris deposits and therefore the pigments were not exposed to heat development and as a consequence they didn't change colour.

¹¹ JOSEF ZEMP / ROBERT DURRER 1906–1910 (see note 5). Scans of these watercolours have been gathered during WP1 (EAD-93–EAD-108).

¹ LM-11990.1-4a, LM-11991.1-8, LM-11992.1-7, LM-11993, LM-11994, LM-11995.1-6.

² MARTA CAROSELLI / ALBERTO FELICI, *Report – Emergency measures on detached wall paintings from Müstair, treatments carried out on the 4th and 5th April 2018*, internal document.

³ WP1: Archival Research and Digital Photographic Documentation. WP2: Observation and Documentation of the State of Conservation. WP3: Non-Invasive Analyses, WP4: Invasive Analyses, WP5: Development of a Conservation-Restoration Concept.

⁴ JÜRG GOLL, *Die Wandbilder in Raum und Zeit*, in: Müstair. Die mittelalterlichen Wandbilder in der Klosterkirche, eds. JÜRG GOLL, MATTHIAS EXNER, SUSANNE HIRSCH, Zurich 2007, pp. 47–74.

⁵ JOSEF ZEMP / ROBERT DURRER, *Das Kloster St. Johann zu Münster in Graubünden*, Geneva 1906–1910.

⁶ GUIDO BOTTICELLI, *Metodologia di restauro delle pitture murali*, Florence 1992, p. 113.

⁷ Patrick Cassitti's in situ inspection of the attic in the St. Nikolaus Chapel confirms that the shape and the style of the paintings are consistent with this hypothesis.

⁸ Today: Christian Schmidt Malermeister AG, Zurich.

⁹ PAOLO MORA / LAURA MORA / PAUL PHILIPPOT, *Conservation of Wall Paintings*, Oxford 1984, pp. 245–261.

¹⁰ VOLKER SCHAILBE, *Historisches und Ethisches zur Wandmalereiabnahme*, in: Historische Technologie und Konservierung von Wandmalerei, Bern 1985, p. 143.

¹¹ ERIC M. MOORMAN, *Destruction and Restoration of Campanian Mural Paintings in the Eighteenth and Nineteenth Centuries*, in: The Conservation of Wall Paintings, ed. SHARON CATHER, Marina del Rey 1991, pp. 87–101.

¹² The earliest known examples of the detachment and transport of wall paintings in Switzerland date from the first quarter of the 19th century and concern paintings from the town hall of Basel, ALBERT KNOEPFLI, *Schweizerische Denkmalpflege. Geschichte und Doktrinen*, Zurich 1972, p. 59; CHRISTIAN HEYDRICH, *Die Wandmalereien Hans Bocks d. Ä. von 1608–1611 am Basler Rathaus. Zu ihrer Geschichte, Bedeutung und Maltechnik*, Basel 1990, p. 1. For a brief review of the practice of the detachment of wall paintings in Switzerland, see: CAMILLA MARTINUCCI, *I lacerti staccati del ciclo romanico di Müstair (GR). Studio e proposta di intervento al supporto*, Master Thesis SUPSI, Mendrisio 2019–20, pp. 30–59.

¹³ BETTINA ACHSEL, *Das Manuale von Giovanni Secco Suardo von 1866/1894*, Göttingen 2012, p. 248.

¹⁴ LUCA CIANCABILLA, *Stacchi e strappi di affreschi tra settecento e ottocento. Antologia dei testi fondamentali*, Florence 2009.

¹⁵ MIRJAM JULLIEN, *Christian Schmidt, Dekorationsmaler und Restaurator – Ein Beitrag zur schweizerischen Restaurierungsgeschichte*, Diplomarbeit HKB, Bern 2005.

¹⁶ *Schweizerisches Landesmuseum in Zürich. Neunzehnter Jahresbericht 1910*, Zurich 1911, p. 14.

¹⁷ DIONE FLÜHLER-KREIS, *Karolingische Wandgemälde aus der Klosterkirche im Schweizerischen Landesmuseum in Zürich*, in: Die mittelalterlichen Wandmalereien im Kloster Müstair. Grundlagen zu Konservierung und Pflege, eds. ALFRED WYSS / HANS RUTISHAUSER / MARC ANTONI NAY, Zurich 2002, pp. 63–75.

¹⁸ Telephone conversations between Stefan Zweifel and Dione Flühler-Kreis 29. 11. 2019 and 02. 12. 2019 concerning the question of the tracings, which according to her essay may have been made before the detachment. On p. 66 she refers to the typical procedures during a *strappo*, and not to the Müstair case in particular. She herself has never seen any tracings and, due to the arduous conditions in the attic, does not believe that any were made. If they had been, they would have been working materials from the Schmidt workshop, which would have been disposed of after use. Rather, she assumes that the retouching was done on the basis of Zemp's and Durrer's watercolours.

¹⁹ *Schweizerisches Landesmuseum in Zürich. Neunzehnter Jahresbericht 1910*, Zurich 1911, p. 11.

²⁰ Chr. Schmidt Söhne, invoice dating from 25 January 1938 in the archive of the Swiss National Museum.

²¹ *Schweizerisches Landesmuseum Zürich. 74. Jahresbericht 1965*, Zurich 1966, p. 24 and *Schweizerisches Landesmuseum Zürich. 77. Jahresbericht 1968*, Zurich 1969, p. 34.

²² An *imprint* is a residue of paint layer, which is still in situ in the attic of the church as a result of an incomplete detachment process.

²³ These different areas result from a fire. The unaffected areas were probably covered by debris so that the pigments were not exposed to heat development and as a consequence didn't change colour.

²⁴ JOSEF ZEMP / ROBERT DURRER, 1906–1910 (cf. note 5). Scans of these watercolours were gathered during WP1 (EAD-93–EAD-108).

²⁵ These included laboratory-based XFR and FTIR, micro-Raman spectrometry, chemical tests and Scanning Electron Microscopy with Energy Dispersive X-Ray Spectroscopy (SEM-EDX). Detailed information on the analytical protocol is described in: TIZIANA LOMBARDO / MARTA CAROSELLI / CAMILLA MARTINUCCI / PATRIZIA MORETTI / ERWIN HILDBRAND / PATRICK CASSITTI, *The detached wall painting from Müstair: pigments and painting stratigraphy of the Carolingian and Romanesque cycles*, and in: MARTA CAROSELLI / PATRIZIA MORETTI / CAMILLA MARTINUCCI / ERWIN HILDBRAND / TIZIANA LOMBARDO, *Investigation of the materials used for the detachment and conservation of the Carolingian wall paintings from Müstair, collected at the Swiss National Museum*. Both articles are currently in preparation.

²⁶ SWITCH is, next to other services provided, the network of the Swiss academic community, <https://www.switch.ch/de/services/#Network>.

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Figure 3. from: GUIDO BOTTICELLI, Metodologia di
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SUMMARY

The 1st phase of the project “The detached wall paintings from the attic of the monastery church St. Johann in Müstair in the collection of the Swiss National Museum; Research and development of a conservation and restoration concept” was realised between September 2019 and August 2021. It aimed to carry out detailed research on the objects in the possession of the SNM as part of an interdisciplinary collaboration between the project partners Swiss National Museum (SNM), the Scuola universitaria professionale della Svizzera italiana (SUPSI) and the Stiftung Pro Kloster St. Johann (SKSJ). The tasks included the research of the history of the object groups SNM and Müstair, their digital photographic documentation, the investigation and documentation of the conditions of the object groups, the scientific investigations and analyses and eventually the development of a concept for future conservation and restoration treatments. An expert advisory board closely accompanied the project to ensure the quality of the steps and to include the different perspectives from the fields of conservation, monument preservation and museum. The Canton of Graubünden, the Swiss National Museum and the Ars Rhenia and Baugarten foundations financially supported the project. The discussions, findings and results of the five work packages now form the basis for the second phase of the project, in which the realisation of the conservation and restoration measures will be the main focus.

RÉSUMÉ

La première phase du projet intitulé «Les fresques prélevées des combles de l'église conventuelle Saint-Jean à Müstair dans la collection du Musée national suisse ; recherche et développement d'un concept de conservation et restauration» a été réalisée entre septembre 2019 et août 2021. Son objectif était d'analyser ces objets de manière approfondie, dans le cadre d'une collaboration interdisciplinaire entre les partenaires associés au projet, à savoir le Musée national suisse (MNS), la Scuola universitaria professionale della Svizzera italiana (SUPSI) et la fondation Pro Kloster St. Johann (SKSJ). Les tâches établies comprenaient l'étude de l'histoire des groupes d'objets du MNS et de Müstair, leur documentation photographique numérique, l'examen et la documentation de l'état de conservation des groupes d'objets, l'étude et l'analyse scientifique ainsi que le développement d'un concept pour des mesures de conservation et restauration. Un comité d'expert-e-s a suivi de près le projet, afin d'assurer la qualité des phases du projet et d'intégrer les différentes perspectives provenant des domaines de la conservation, de la protection des monuments historiques et du musée. Le canton des Grisons, le Musée national suisse ainsi que les fondations Ars Rhenia et Baugarten ont apporté leur soutien financier au projet. Les discussions, conclusions et résultats issus des cinq groupes de travail constituent désormais la base de la deuxième phase du projet, axée principalement sur la mise en œuvre des mesures de conservation et restauration.

ZUSAMMENFASSUNG

Die erste Phase des Projekts: «Die abgenommenen Wandmalereien aus dem Dachraum der Klosterkirche St. Johann in Müstair in der Sammlung des Schweizerischen Nationalmuseums; Erforschung und Entwicklung eines Konservierungs- und Restaurierungskonzepts» wurde zwischen September 2019 und August 2021 realisiert. Ziel war es, im Rahmen einer interdisziplinären Zusammenarbeit zwischen den Projektpartnern Schweizerisches Nationalmuseum (SNM), der Scuola universitaria professionale della Svizzera italiana (SUPSI) sowie der Stiftung Pro Kloster St. Johann (SKSJ), die Objekte eingehend zu untersuchen. Die Aufgaben umfassten die Erforschung der Geschichte der Objektgruppen SNM und Müstair, deren digitale fotografische Dokumentation, die Untersuchung und Dokumentation des Zustands der Objektgruppen, die wissenschaftliche Untersuchung und Analyse und die Entwicklung eines Konzepts für Konservierungs- und Restaurierungsmassnahmen. Ein Expertenbeirat begleitete das Projekt eng, um die Qualität der Schritte zu sichern und die verschiedenen Perspektiven aus den Bereichen Konservierung, Denkmalpflege und Museum einzubringen. Der Kanton Graubünden, das Schweizerische Nationalmuseum sowie die Stiftungen Ars Rhenia und Baugarten haben das Projekt finanziell unterstützt. Die Diskussionen, Erkenntnisse und Ergebnisse aus den fünf Arbeitspaketen bilden nun die Grundlage für die zweite Phase des Projekts, in der die Umsetzung der Konservierungs- und Restaurierungsmassnahmen im Vordergrund stehen wird.

RIASSUNTO

La prima fase del progetto «Le pitture murali rimosse dal tetto della chiesa del Monastero di San Giovanni a Müstair appartenenti alla collezione del Museo nazionale svizzero; ricerca e sviluppo di un progetto di conservazione e di restauro» si è svolta dal settembre 2019 ad agosto 2021. Il progetto aveva l'obiettivo di esaminare i reperti in dettaglio nell'ambito di una collaborazione interdisciplinare tra i partner del progetto Museo nazionale svizzero (MNS), la Scuola universitaria professionale della Svizzera italiana (SUPSI) e la Fondazione Pro Kloster St. Johann (SKSJ). I compiti includevano la ricerca sulla storia dei gruppi di reperti SNM e Müstair, la loro documentazione fotografica digitale, l'indagine e la documentazione delle loro condizioni, l'indagine e l'analisi scientifica e lo sviluppo di un progetto di misure di conservazione e di restauro. Un comitato consultivo di esperti ha accompagnato da vicino il progetto per assicurare la qualità delle diverse fasi e per introdurre le diverse prospettive nell'ottica della conservazione, della tutela dei monumenti e del museo. Il progetto ha beneficiato del sostegno finanziario del Cantone dei Grigioni, del Museo Nazionale Svizzero e delle Fondazioni Ars Rhenia e Baugarten. Le discussioni, le scoperte e i risultati dei cinque pacchetti di lavoro formano ora la base per la seconda fase del progetto, che si concentrerà in primo luogo sulla realizzazione delle misure di conservazione e di restauro.