

# **CONSERVATION OF WALL PAINTINGS AT SUUREMÕISA MANOR**

Sustainable Report No. 9

# CONSERVATION OF WALL PAINTINGS AT SUUREMÕISA MANOR

## - Sustainable Report No. 9

HIIUMAA, ESTONIA // INTENSIVE COURSE AUTUMN 2015

*A joint project between Uppsala University, Estonian Academy of Arts, Novia University of Applied Sciences and supported by the Nordic Council of Ministers through Nordplus funds.*



### Participants:

ESTONIA: Estonian Academy of Arts (EAA), Tartu Art College (TAC), Hiiumaa Vocational School (HVS)

FINLAND: Novia University of Applied Sciences (Novia UAS)

SWEDEN: Uppsala University Campus Gotland (UU)



## Summary

Suuremõisa is one of the grandest baroque manor structures in Estonia. The history of the estate can be traced back to before the 16th century. The current building was erected in 1755–60 probably on top the remains of an older building by the Stenbock family. The architect is thought to have been Joseph Gabriel Destain. In 1772, the main building was extended with two, one-floor wings and a ceremonial courtyard. Inspiration for the architecture, notably the hipped mansard roof and the two wings, came from Ulriksdal Palace in Sweden. The building still displays some of the original details, such as the fine carved baroque main door and the lime rendering on the facades, not to mention the original windows. Inside the mansion, many panels and mouldings, staircases, doors, ceiling paintings etc. date back to the 18th century.

The manor has belonged to several well-known members of the Swedish and Baltic German nobility. One of the most infamous and colourful landlords was Otto Reinhold Ludwig von Ungern-Sternberg (1744–1811) who was sent to Siberia in 1804 as a punishment for murdering a Swedish sea captain. His extraordinary life has inspired literary works as well as local lore.

Today, the manor in Suuremõisa is home to Hiiumaa Vocational School and Suuremõisa Elementary School.

## Project overview

Renovation work at the main building started in September 2014. Students attending an intensive Sustainable Heritage Course took part in this work a year later to learn about the crafts and materials involved in a building project of this kind and scale.

The students contributed to the conservation of wall paintings in two rooms on the ground floor of the building. The early layers of the murals were thoroughly examined by students under the professional guidance of Hikka Hiiop, Merike Kallas of the Estonian Academy of Arts and Heli Tuksam of Tartu Art School. Based on the results, the concept and methods for preservation were then established and put into practice on sample areas. The original decor is naturally of great historic value. The aim was to preserve these interiors. Good samples of the paintings were exposed and their condition was conserved.

The Sustainable Heritage course lasted just for a week. Yet, the sustainability of the project will be ensured by the students and tutors of Hiiumaa Vocational School who will complete the conservation work within the framework of their studies.

Once again students from Estonia, Sweden and Finland were offered a unique learning experience, expertly organised by Maris Veeremäe of the Estonian Academy of Arts. The days were filled with interesting conservation work and the evenings with excursions to the sights of beautiful Hiiumaa, guided by Dan Lukas from the National Heritage Board of Estonia.

The intensive course was made possible through Nordplus financing (scholarships for students travelling and accommodation).

# STUDENT REPORT

**Monday, 24 August**

**By Robin Lindqvist, Andreas Selenius (Novia UAS)**

On arrival at Suuremõisa, we had a briefing about the manor and its surroundings. It is a baroque-rococo building. Construction started in 1755 and was completed by 1760. The owner of that time was Ebba Margaretha von Stenbock. In 1772 the main house was extended by adding two, one-storey wings, one to each side of the building, which then boasted 64 rooms in total. The building was made of local limestone and it is said that the stones were transported to Suuremõisa by a human chain from Hilleste limestone mine a few kilometers away.



*Suuremõisa manor. Photo: Andreas Selenius*

## **The Basement**

The basement featured vaults of limestone. The higher ranked paid servants lived in the basement which was also used as a working space and storage area.



*Basement. Photo: Robin Lindqvist.*



The basement was renovated in 2015 when the new ventilation system and electrical wiring were also installed. The ceilings and walls were painted white. Some of the floors were also retiled.



Ventilation machine. Photo: Robin Lindqvist.



New flooring in the basement. Photo: Andreas Selenius.

### 1<sup>st</sup> floor

On the first floor the ceiling is reinforced with a pillar to prevent it from collapsing due to large loads on the 2<sup>nd</sup> floor.



The pillar. Photo: Robin Lindqvist.

The original ceiling paintings in some of the rooms have been recreated. In some of the rooms the floors were replaced and the panels and walls painted over. Due to heavy water damage one of the ceilings had to be reinforced using a metal plate which is hanging from the roof truss.



*Recreated painting. Photo: Andreas Selenius.*



*The carved oak staircase leading up to the 2nd floor right from the entrance. Photo: Andreas Selenius*



*Staircase seen from the 2nd floor. Photo: Robin Lindqvist*



## 2<sup>nd</sup> floor

On the second storey there is a wall which is made of wood which was constructed later. The rest of the walls are made of stone. The metal beams leading from the roof truss to the metal plate reinforcing the floor can be found inside the wooden wall.



*The wooden wall. Photos: Robin Lindqvist.*

## Attic

The attic was used as the living area for servants. The small rooms are made of wood and bricks. The filling material in the roof has been renewed. The roof truss is made of massive wood. The huge chimneys also worked as a ventilation system and are connected to most rooms in the manor. Some of the ceiling constructions had to be renewed and reconstructed due to damage caused by fire and old age. There were 4-6 windows but they were removed due to leakage. The three roof-windows are original and were made locally in Hiiumaa.



*Servants living area. Photo: Robin Lindqvist*



*Metal beam, Russian-time engineering. Photo: Robin Lindqvist*



*The huge chimneys. Photo: Andreas Selenius*



*The roof truss of massive wood. Photo: Andreas Selenius*



## Tuesday, 25 August

By Mihhail Staško, Taavi Tiidor (EAA); Magdalena Karlsson (UU), Anna Holmberg (Novia UAS)

On the first day of the conservation in Suuremõisa surface cleaning, preparations for reconstruction (stencils and casein), stratigraphic examination and photo documentation were done. The process took place in room N16 and N2 located on the second floor.

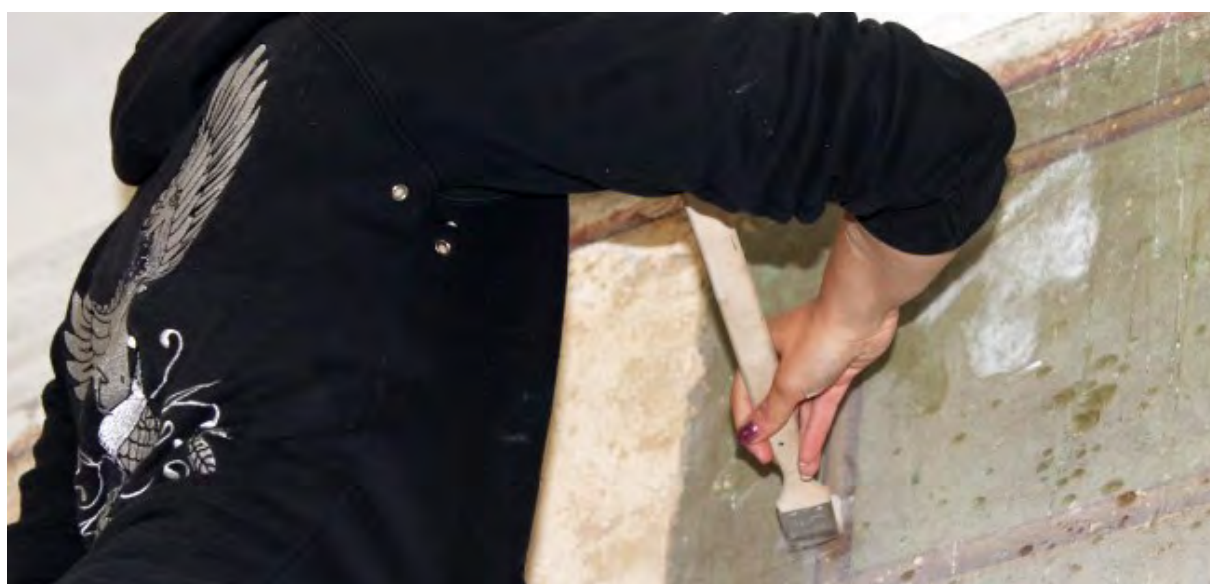


### Room N16

In room N16 the cleaning process took part on the single fragment of wall N1. The fragment represented a green wall painting covered with wallpaper glue.

The first task was to clean the walls with brushes to get all the loose dust away. The painting was also measured and drawn at the beginning of the day.

After dusting, the next step was sponge cleaning. The particular sponge used is made of natural rubber. The rubber sponge used is widely used in the conservation field due to its neutral pH and ability to effectively pull the dirt from the surface due to the high porousness of the sponge.



Dusting the wall surface. Photo: Anna Holmberg

The next task was to remove the glue using wet mechanical method. The glue was firstly moistened using water and then carefully removed using scalpel blades.

By the end of day one the superficial dirt had been removed and the wallpaper glue partially removed from the wall painting.



*Kautchuck sponge cleaning. Photo: Anna Holmberg*



*Wallpaper glue residues test cleaning. Photo: Anna Holmberg*

## Room N2

The first task was to do the surface cleaning using scalpels, then to clean the surface using a natural rubber sponge to remove the loosen parts of the superficial dirt. The dirt layers which were not removable with dry mechanical methods, were partially removed using a swab moistened in acetone.

In Room N2 the cleaning took place on wall 1, wall 2 and wall 3. In the upper section of wall 1, more layers were discovered.

These were:

1. Base
2. Plaster /Lime wash
3. Brownish red paint layer
4. Plaster /lime wash
5. Light green colour
6. Plaster/ lime wash
7. Brown paint layer
8. Plaster / Lime wash
9. Red paint layer
10. Plaster/ Lime wash
11. Wallpaper fragments

As one of the oldest and best preserved colour layers, the green paint layer emphasized. The lost parts of the green paint layer on the wall 1 were reconstructed in order to obtain the visual integrity of the room. The walls 2 and 3 were left unreconstructed, as the conservation work was based on on the principle of minimal interpretation and intervention.



*Wall 1 fragment. Photo: Anna Holmberg*





*Photos depicting the process of revealing the green paint layer. Photos: Anna Holmberg*

### **Reconstruction preparations**

In the green room, there were ornaments at the top of the walls that were going to be reconstructed and in some places, renewed. To perform the reconstruction, the reproduction of the green ornament was needed. The first task was to duplicate the ornament on transparent piece of paper using plain graphite pencil.

The next task was to make a stencil. The preparation phase consisted of sizing a thick piece of paper with linseed oil. After the sizing of the paper, it was left to dry for a day. The linseed oil sizing was done to prevent the stencil from changing during the process of paint application.



*Reproduction of the ornament outlines through transparent paper. Photo: Anna Holmberg*

The next step was to make a casein medium to be used as a paint binder. The casein paint medium consisted of dry casein powder, water and borax. Casein is normally a protein extracted from cottage cheese. Borax is a mineral based material. Its use allows the casein medium to obtain a neutral pH and be used with all kinds of pigments.<sup>1</sup>

---

<sup>1</sup> Sinopia Pigments, [http://www.sinopia.com/-Casein-Milk-Paint-Recipe\\_c\\_41.html](http://www.sinopia.com/-Casein-Milk-Paint-Recipe_c_41.html) [15-09-03]

**Recipe:***Ingredients by weight:*

2 1/2 oz. (80g) Casein Powder  
9 fl. oz. (ca 250ml) cold water  
1 oz. (32g) Crystalline Borax  
9 fl. oz. (ca 250ml) hot water

*Preparation:*

1. The dry casein powder is soaked in cold water for approximately one night
2. Borax powder dissolved in warm water
3. Borax solution is added to casein solution and stirred
4. The mixture is left to cool down



*Preparation of the casein medium.  
Photo: Anna Holmberg*

**Wednesday, 26 August**

**By Sofia Koskinen (Novia UAS), Johanna Lamp (EAA), Josefine Israelsson (UU), Liina Talts (TAC);**

**Room N16**

Today we continued cleaning the W-wall painting. We finished scraping out a part of the flower ornament above the green wall painting.

For the green surface we used clean water and toothbrushes to remove the wallpaper glue residues.



*Karin cleaning the W-wall painting. Photo: Josefine Israelsson*



*Picture of all the tools to clean and plaster the holes. Photo: Liina Talts*

When we were satisfied with the result of the cleaning, we started filling the holes. We used an air pump to get the loose particles out of the cavity so the plaster could stick better. The plaster consisted of  $\frac{3}{4}$  sand and of  $\frac{1}{4}$  lime, the filler was cattail fluff (kaveldun).





*Air pumping the dirt away from the holes. Pictures of holes on the W-wall painting and holes filled up with plaster. Photos: Josefine Israelsson*

## Room N2

Also in room N2 we continued cleaning the wall painting (mint-green walls and two different stencil ornaments on the upper part of the wall). We worked on every wall but we focused on the S-wall since it was supposed to serve as an example in the end. The residues of plaster and putty were removed mechanically with scalpels and for soot deposits we used water and sponges or sand paper. Ugly yellowish brushstrokes were removed with acetone. When we considered the wall to be clean enough, we consolidated the wall painting of the S-wall with a transparent layer of casein using spray bottles.



*Cleaning the example wall. Photo: Josefine Israelsson*

Whilst cleaning the visible paint layer, we continued exposing small sample areas of the wall painting underneath it. We discovered that in the first paint layer, there was probably some kind of vessel on a tripod painted on the upper part of the wall and large panels with ornamented borders in the lower parts of the wall.



*Exposing sample areas of the first wall painting. Photos: Taavi Tiidor*

We also continued with preparations for reconstructing the ornaments on the S-wall, where it was missing since there used to be a fireplace there.

We used two techniques to transfer the image on the wall to paper. The first technique was to punctuate with a needle the outlines of the ornament. The second one was to cut out the ornament, thus creating a stencil.



*Magdalena using the needle to punctuate the outlines of the ornament and a close-up of the ornament. Photos: Josefine Israelsson*



*Rebecca cutting out the ornament and a close-up of the stencil. Photos: Josefine Israelsson*



Room N2. Schematic reconstruction of the 1. wall painting layer on the East and South walls by Johanna Lamp (EAA)

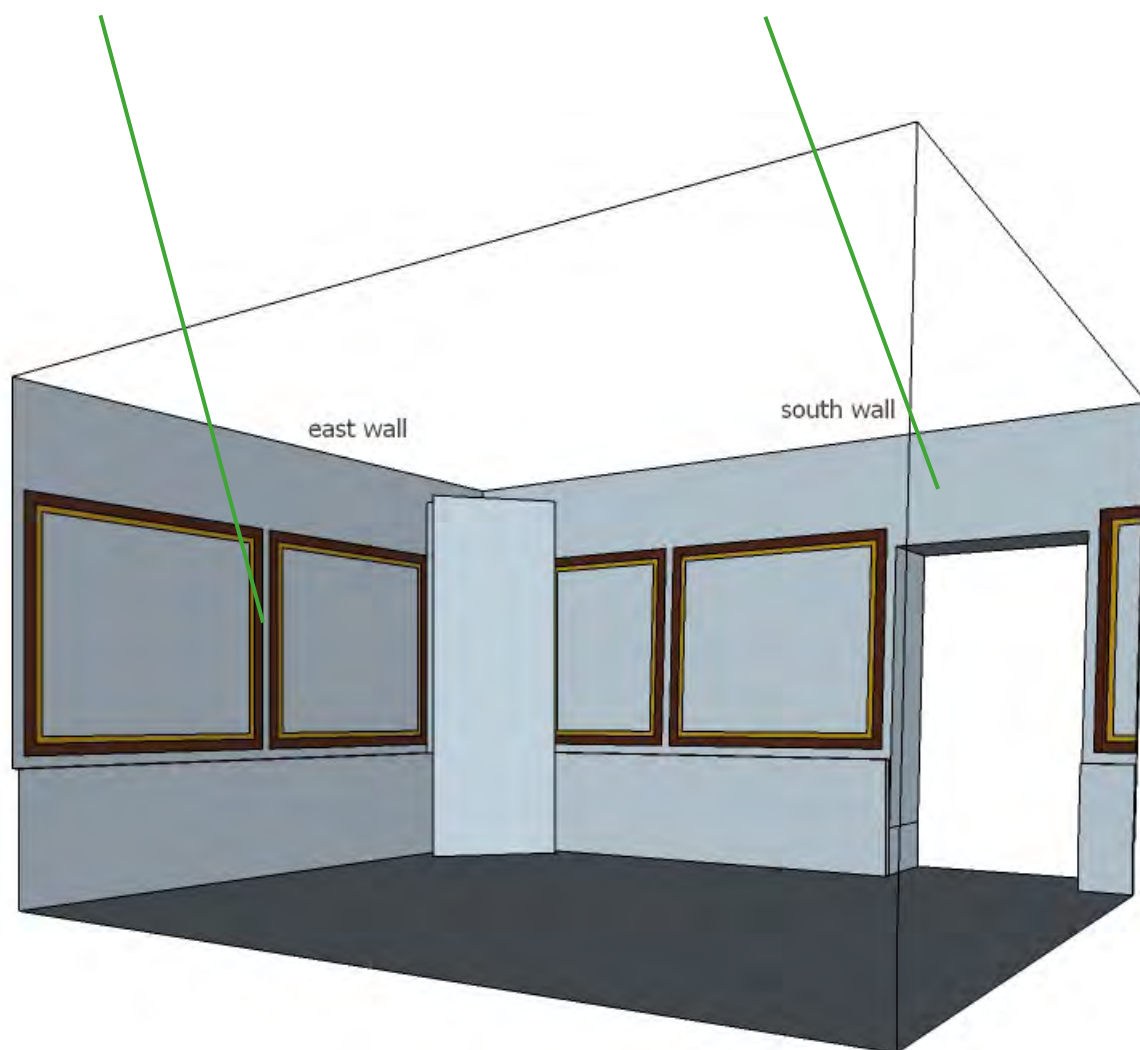


*Close-up of the flower ornament on the brownish-red frame.*

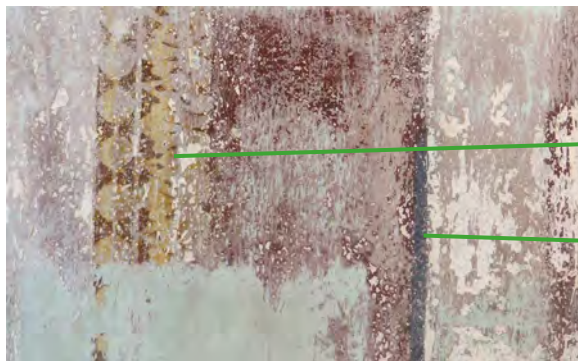
*Little fragments of bluish-green paint inbetween two painted panels.*



*Sondage on the upper part of the wall. Supposedly some kind of a vessel on tripod.*

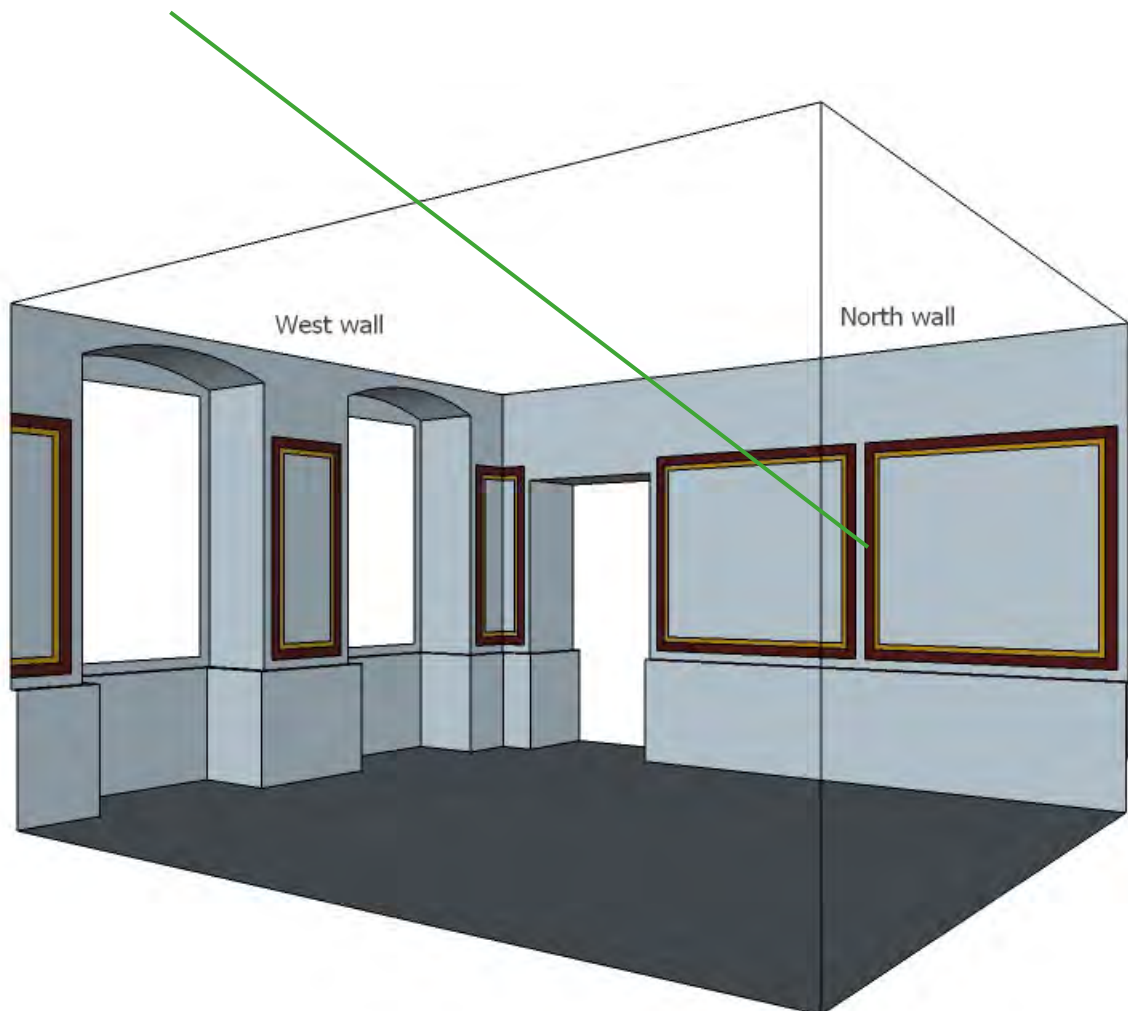


Room N2. Schematic reconstruction of the 1. wall painting layer on the West and North wall by Johanna Lamp (EAA)



*Close-up of the ornament on the ochre yellow frame*

*A thin blue line on the border of the brownish-red frame*





**Thursday, 27 August**

**By Viktoria Arvidsson, Rebecca Vemdal (UU); Sandra Heinma (HVS), Kristiina Frolova (EAA)**

### **Room N2**

During the morning gathering we decided that the work in room N2, the green room, should concentrate on the south wall to give it a finished look. This decision was partly due to the reconstruction which was to take place in the southeast corner of the room. Some students continued the work filling holes with the coarse plaster that had been made the previous day.



*Work with filling holes with plaster continued. Photo: Rebecca Vemdal*



*Mixing of pallets to get right hue of colour.*

*Photo: Rebecca Vemdal*

Palettes were mixed to match the existing historical colour on the walls. The pigments used together with the kasein mixture included chrome oxide, yellow ochre, iron oxide black and chalk white, all of these together came as close as possible to the original colour. Aquarelle colours were also used during the process of painting, to give the finished result a more transparent hue, and not to interfere with the historic feel. Another reason for the use of watercolours is because the result will be more reversible than would be the case with a pure casein based colour.



*Student being shown how to mix the watercolour with the kasein. Photo: Viktoria Arvidsson*



*Retouching of stains and blemishes on the south wall. Photo: Rebecca Vemdal*



*Right: Student scraping paint to reveal flower ornaments on the east wall.*

*Photo: Viktoria Arvidsson*

We retouched the red/brown ornaments along the walls and also started work on the homogenous green by retouching stains and blemishes on the south wall.

The southeast corner was prepared for reconstructing the paint and ornament for the following day.

The cleaning of the ornaments with scalpels continued, and during this process another blue ornament was discovered above the door.

The cleaning and revealing of the flower ornament continued on the east wall and we found traces of the same ornament on the north wall as well. Also the pattern of the ornament became clear. A test stencil was made of that very same ornament.

### **Room N16**

We continued to fill holes with fine plaster. Excess plaster was removed carefully with sponges and water. Tests were made to find the right palette to fit with the historical color of the wall. In this room casein based paint was also used and we applied the same process of mixing the pigment base with aquarelle colours for reversibility.

When the right colour was found we started retouching the spots on the panel. The frame of the panel also had work done, same as the border with a small flowery pattern.

Day three of the project was only a half day due to an afternoon excursion, hence the work finished after lunch before recommencing the next day.





*Dried plastered holes ready for retouching with paint. Photo: Rebecca Vemdal*



*Filling of small holes in room N16.  
Photo: Vikoria Arvidsson*

## **Friday, 28 August**

**By Claudia Valge, Diana Haapsal (EAA); Viktor Källgren (UU), Tea Heimbürger (Novia UAS)**

On Friday the group concentrated on finishing work in room N2 of the manor house. The main aim of the workshop was to conserve the south wall of this room since it hosted the best preserved stencil paintings. Therefore, most of the participants focused on filling in the uncoloured, and discoloured spots on the south wall. In order to give the south wall a more homogeneous appearance, casein colour mixed with several pigments or various watercolours were used.

It was a time-consuming process to mix a perfect-toned green casein colour to match the green finishing of the walls. First, a trial batch of green casein colour was made to try out on the western side of the south wall which was later to be replastered. The green colour was mixed using a variety of pigments: Chalk White, Chrome Green, Pine Needle Green, Turquoise, Deer Brown, Iron Oxide Black, Zinc White and Yellow Ocre.



*Rebecca filling in blank spots. Photo: Viktor Källgren*



*The green casein colour drying. Photo: Diana Haapsal*

The finished product was then applied with either a brush or a sponge to all the noticeably discoloured patches on the walls. In some discoloured areas we needed to remove dark paint layers or soot prior to the recolouring. Some of us continued previous day's work by cleaning out the stencil paintings hidden underneath smudgy wallpaper paste or secondary paint layers.



*Claudia cleaning out the amphora with a scalpel. Photo: Diana Haapsal*



*Kirsti cleaning out the earlier wall painting. Photo: Diana Haapsal*

Due to poorly preserved colours in certain areas, it was also necessary to fill in minor lacunae in the stencil paintings. This was done using the *aqua sporca* technique with much diluted watercolours. The aforementioned method, which is also called the "flat on surface" technique, consists of covering the lacunae with neutral colours similar in hue to the painting, in order to create an aesthetic whole. In doing so the original painting becomes more visible whilst retaining its authentic essence.



*Magdalena doing neutral retouch with a brush. Photo: Diana Haapsal*



*Egle making greyish spot even with white chalk. Photo: Diana Haapsal*

Similar in principle, is the method of negative retouching which was applied on the even earlier painting layer revealed on the west and south wall. Since these red and yellow toned panel paintings were significantly less well preserved, it was often impossible to trace their exact patterns. Therefore, negative retouching was used to fade the white plaster background and bring out the painting. This was achieved by using neutral coloured chalks: light beige for the greenish parts, light grey for the yellowish parts and the white for grey and darkened parts.

After retouching, the paintings were also consolidated using a 1:10 mixture of casein and water. This enabled us to reapply the loose pigments of the paintings to the wall. Due to time constraints some stencil paintings were left to be retouched later by the students of traditional building at Hiiumaa Vocational School.

In order to complete the finishing of the south wall, some minor holes from nails and other damage had to be filled with fine plaster. The plaster which consisted of lime, sand, water and typha was applied with a spatula and a wet sponge to blend the surface with the surrounding areas. The plaster corrections were later tinted with the green casein colour to match the colour of the conserved walls.





*Viktor fixing holes with plaster. Photo: Diana Haapsal*



*Recently placed plaster in 3 damaged spots on the south wall.  
Photo: Viktor Källgren*

In the re-plastered top left corner of the south wall Mihhail and Egle used previously made stencils to reconstruct the painting. Using stencils eased the continuation of the original ornaments on the left side of the wall. The first stencil was made by copying the herbal ornament on the top of the wall to some tracing paper. Then it was applied to a thicker paper by pricking through the lines of the ornament using a pin. This method enabled to copy the pattern on the wall by fixing the stencil to the desired location and sponging the ornament on the wall with a subtle loose pigment. As the guidelines were therefore visible on the wall, it was easy to complete the job by hand.



*Heli is using a sachet with pigment to attach it to the wall using the pinned through stencil. Photo: Viktor Källgren*



*Photo: Diana Haapsal*

The lower ornament was cut out of a traced copy of the original and applied directly onto the wall, dabbing pigment through the fixed stencil. The two different colours of the newly made ornaments were tried out by Mihhail and Egle to match the colour of the original ornaments. The new ornaments were painted with a slightly weaker-pigmented colour than the original so as to be identifiable as secondary additions.

In order to give every participant a chance to practice creating stencil paintings, the three groups of students from Sweden, Finland and Estonia were each allotted a piece of masonite to make their own attempts at the two different stencils.



Rebecca is filling in the shadows of one of the ornaments made on masonite. Photo: Viktor Källgren

## Saturday, 29 August

By Egle Mikko, Reelika Tooming (TAC)

### Finishing room N2

#### South Wall

On Saturday 28<sup>th</sup> of August we started to finish work on the south wall in the main room of focus. By that time, work in the second room N16 had been finished to a satisfactory level. Mainly the S-walls reconstruction of a continuous part of the original ornament was touched up by Mihhail to add shadow, light and also lighten the gray color of the background (background color was lightened with pastels). Most of the work, cleaning and retouching to the original ornaments was completed. Some finishing touches with watercolors to the S-walls original ornaments were made by Merike Kallas and Hilka Hiiop. Also on the S-wall, the doors portal, Claudia completed her cleaning of the victory chalice giving it a minimal retouch of color. The outcome of cleaning the victory chalices ended up entirely different from what had first been retraced on paper. In the first retracing (done on Tuesday 24.08.15) was a guess that, what turned out later to be torches, were a crossed feather and sword at the foot of the chalice. This new discovery was also corrected on the reproduction of the chalice (Friday 27.08.15).



Mihhail adding shadow. Photo: Egle Mikko



Claudia and her model the chalice. Photo: Egle Mikko



The rest of the South wall was also done via the aqua-sporca technique, last touches for the green wall were applied and the scaffoldings were removed from the room. Both N2 and N16 were given a thorough Scandinavian style speed cleaning, with Kirsti leading the massed ranks of students in this process.



*Merike doing some last touches. Photo: Viktor Källgren*



*Finished look of the south wall. Photo: Merike Kallas*



*Satisfied Uppsala student Viktoria standing next to her findings. Photo: Egle Mikko*

### **North, West and East Wall**

The work on the other walls were left unfinished due to the fact that there was no time to give them the proper attention that they needed. But a lot of information was gained from the earlier paintings that were revealed on all of the three walls, which had been properly framed, cleaned and retouched. Findings on these walls gave us a better idea of what lays beneath the green layer of paint and also a better idea of what to do with the information next.

## Summary

Since Saturday was also our last day in Suuremõisa manor house we finished up our work and cleaning of the room by 10:30 am, and shared reflections and feedback on our stay and intensive course at Suuremõisa.

Hilkka gave a speech on our discoveries and the importance of the work we had done in those two rooms. Also addressing the need for people in the same profession, all with a different take on the subject, to be able to communicate through the conservation of these historical places, so it could be carried out to the highest standards possible. Our contribution to these rooms will be continued using the same techniques, materials and knowledge by Hiiumaa Vocational School and their attentive teachers Karin Kirtsi and Andres Veel.

Even though room N2 wasn't completed, we gained a lot of information of the history that was hiding beneath the wall and also the skills required to get it out to the open and give it new life.



*Hilka talking in her loud voice. Photo: Viktor Källgren*



## PARTICIPANTS

### ESTONIA:

#### **Estonian Academy of Arts (EAA)**

Students: Kristiina Frolova, Diana Haapsal, Johanna Lamp, Mihhail Staško, Taavi Tiidor, Claudia Valge

Teachers: Hilka Hiiop, Merike Kallas, Maris Veeremäe

#### **Tartu Art College (TAC)**

Students: Egle Mikko, Liina Talts, Reelika Tooming

Teacher: Heli Tuksam

#### **Hiiumaa Vocational School (HVS)**

Student: Sandra Heinma

Teachers: Karin Kirtsi, Andres Veel

### FINLAND:

#### **Novia University of Applied Sciences (Novia UAS)**

Students: Tea Heimbürger, Anna Holmberg, Sofia Koskinen, Robin Lindqvist, Andreas Selenius

Teachers: Towe Andersson, Kirsti Horn

### SWEDEN:

#### **Uppsala University Campus Gotland (UU)**

Students: Viktoria Arvidsson, Josefine Israelsson, Magdalena Karlsson, Viktor Källgren, Rebecca Vemdal

Teachers: Susanna Carlsten, Petra Eriksson

*Hiiumaa, August 2015*

### ABOUT THE SUSTAINABLE HERITAGE PROJECT

The **Sustainable Heritage** project is a partner project in Building Conservation. The project partners are Uppsala University Campus Gotland in Visby, Sweden, the Estonian Academy of Arts in Tallinn, Estonia and Novia University of Applied Sciences in Ekenäs, Finland. The project started in 2008 due to the interest in all three countries in promoting cooperation in a field that is both urgent and worthwhile and of equal importance in all the participating countries.

Students can greatly benefit from working in international teams when they acquire valuable knowledge and skills and gain exposure to differences in working methods, tradition and culture. Each partner organisation will bring their expertise to serve our shared interest in educating young professionals to look after our heritage. The events will be organised in turns by the partner countries. The best professionals will be engaged as teachers, and the overall objective is to sustain our heritage moving forward into the future.

The Nordic-Baltic Network of Engineering and the publication of this report is supported by the Nordic Council of Ministers through Nordplus funds.

This report is about conservation of wall paintings. It is also about what an international group of students learned through their working experience at Suuremõisa manor, lectures and excursions in the island of Hiiumaa in western Estonia.

The project Sustainable Heritage is designed for students of building conservation, conservation of artefacts, structural engineers and site management from three universities in Sweden, Estonia and Finland in order to give them the opportunity to learn about the traditional materials in different parts of buildings.

From the conservation point of view they learn how constructions and surfaces made of these materials are to be preserved in the best manner.

Please, help yourself to more reports and views of the hands-on activities at various historic sites at [www.sustainableheritage.eu](http://www.sustainableheritage.eu).

