Cleaning, Condition Surveying and Maintenance: House Keeping Swedish Style

Ann Hallström, Conservator, Skokloster Castle, Sweden
Erika Hedhammar, Conservator, Swedish National Heritage Board, Sweden
Lisen Tamm, Conservator, Skokloster Castle, Sweden

Abstract

Skokloster Castle and the Hallwyl museum in Sweden are two historic houses and open-display museums with diverse climate control problems. Objects and furnishings require a strategy for their long-term care. This paper presents some of the authors’ experiences that have contributed to developing this strategy. Both interiors and collections have been cared for through the ages in a traditional manner. Conservators and curators started to document this work only in the 1990’s and now after about twenty years conclusions can be drawn from the accumulated experience. In both houses conservators and curators co-operate in a project to clean, undertake a condition survey and maintain the collections, working in one or two rooms per year. As a consequence, light levels and insect infestations are now monitored and cleaning routines are modified.

Keywords

house keeping, condition survey, cleaning, maintenance, Sweden, castle

Skokloster Castle

The building was founded in 1654 and remained the property of three families for the following three centuries. It is considered one of Sweden’s foremost Baroque palaces with almost 80 fully furnished rooms.
Many of the rooms retain their original wall-coverings of gilt leather or woven tapestries and the unchanged interiors have been regarded for generations as being specifically worth preserving. As a rule, the castle was inhabited only during the summer. During the 1940s, the bottom floor was modernized with central heating and electrical lighting. Skokloster Castle is situated on Lake Mälaren in a fertile agricultural landscape. The building consists of four connected wings, each four floors high, enclosing an inner courtyard. The castle’s interiors total about 5500 square meters. The majority of rooms are at least 50 square meters and the ceiling height varies between 3½ to 4½ meters. All rooms have a large open fireplace and high windows (Figure 1).

An employee has traditionally cared for the maintenance of the property and its collections. Special focus has been placed on regular care of the exclusive and comprehensive weapon collection. During the 1700s, the responsible employee also restored paintings and marked his presence by writing his name on objects. Notes found in the archives and correspondence between the castle owner and the employee give information about the care of the collections up to the present day, but in most cases the maintenance and care of objects has been an undocumented process carried out as part of the routine daily tasks. [Kylsberg 1991, Hallström and Tamm 2004]

The castle and its collection was bought by the Swedish state in 1967 and during the 1970s, the building underwent a comprehensive restoration programme, which attempted to use traditional building techniques. The treatments can be summarized in a reference made by the architect responsible, Ove Hidemark:

“The starting point was respect for the layers of time, older construction principles, combinations of materials, and these were seen along side a time scale of genuine and credible ageing.” [Hidemark, 1991]

These principles also formulated the museum’s view and approach to the objects held in the collection and
the interior decorations, where the desire was to disturb surfaces and structures as little as possible. It is clearly visible that the interiors have received very little wear-and-tear during their use and the regular house-keeping has contributed to the objects’ good preservation. The museum is open to public all year but only a limited number of the 30,000 visitors come during the winter months.

In 1980, Skokloster Castle, The Royal Armoury and the Hallwyl Palace were combined under one state museum authority with shared conservation resources, and as a result, consciousness for collection care increased. An important part of this was the collecting and documenting of information about earlier treatments.

**Indoor environment: climate, light and dust**

Since the beginning of the 1970s, the environmental conditions within the building have been monitored, however it is only since the 1990s that these measurements have been systematically recorded. Recorded measurements show that, during winter months the internal temperature often falls below zero, while towards midsummer temperatures inside the building tend to rise to 20 °C. The relative humidity remains, during a large part of the year, higher than 50%, while in winter it can increase up to 80%. The month of August is often warm and humid and interior temperatures can reach around 25 °C, at the same time that the relative humidity can rise to as high as 70%. It should also be noted that the climate varies within the building. The southern side is almost 2 degrees warmer than the northern side for most of the year, which gives rise to a higher relative humidity of 10 to 15% on the northern side. As the windows are not tight fitting, the interiors are immediately affected by external weather changes.

The castle’s owners have never been able to afford to illuminate and keep all rooms heated, and choose instead to leave the house standing almost unused. Thanks to this, the rooms have not been exposed to soot or damaging gases. In recent times, doormats have been placed in order to collect dust and dirt from visitors’ shoes at the entrance to Skokloster Castle. For the same reason, similar mats are placed on the stairs leading up to the castle entrance. Protective matting has been placed in rooms which have easily-damaged wooden floors. Adjoining the building is an avenue of lime trees and wide gravel paths. This means that pollen and dust from the gravel is drawn in to the building from the largely unsealed windows. To minimize the dirt ingress, measures have been taken to reduce car and bus traffic around the building. These measures ensure that potential damages via environmental pollutants are negligible.

Skokloster Castle has traditionally had window shutters. In the 1900s, different combinations of curtains were installed to protect the furnishings from light. Since the 1980s, two pairs of curtains have been mounted: one set of dark green curtains to cut out as much light as possible, and one white set which are always kept closed. The dark curtains are opened when the museum is open to the public. However, the repeated drawing of the curtains weakens the support fixtures. Therefore, soon after the year 2000, a more lasting curtain support technique was developed together with Husgerådskammaren (the Royal Collections). The castle’s furniture components exhibit little evidence of wear. Much of the upholstered furniture has since the 1800s been protected from bleaching, dirt and dust with linen covers. New covers have been sewn as the old ones have become threadbare. Also, sheets have been placed over the bed canopies to collect dust and debris falling from the ceilings. The use of window shutters, protective curtains and furniture covers has certainly contributed to the fact that the furnishing textiles within Skokloster Castle have retained their colours.
Today the castle contains around 500 square meters of gilt leather, exhibiting different patterns and colour schemes. During the first half of the 1900s, it was remounted but replaced in its original location in five of the rooms. It has darkened and become brittle but the colours are still clear.

The leather bindings in the castle library, which has almost 20,000 volumes, have decayed with age and have been further affected by damp. High humidity levels have been a triggering factor for mould growth while the parchment bindings remain dazzlingly white and unaffected by the environment. The evident use of neatsfoot oil and lanolin, used as lubricants during the 1960s, have encouraged dust to adhere to the leather surfaces, both allowing and exasperating mould growth. [Hallström and Arvidson, 2001].

One could suppose that the large metal collection of weapons and tools would show evidence of corrosion in such a humid climate. That this is so seldom the case, is due to the high quality of the raw materials and the exceptional workmanship and blacksmithing present in the majority of metal objects in the collection. On the other hand, there is evidence of repeated corrosion attack over the years on less well constructed objects made for example of sheet iron. These corroded metal surfaces have been routinely treated by removing
corrosion products, which is systematically followed by the application of petroleum-based corrosion-inhibiting wax. The object categories that are clearly faring poorly due to the building’s climate are the glass artworks and the paintings collection. Unstable glass has begun to deteriorate and break down, showing so-called glass sickness, while in particular those paintings restored with older lining techniques exhibit damage resulting from the high relative humidity.

The RTV-project

Conservators working under the earlier state-run administration often concentrated on the most visible, valuable or culturally historical objects. At the beginning of the 1990s, a condition survey was made of the furniture collection. This was the first systematic documentation of an entire collection’s state of preservation. At the same time, it was noticed how dusty the interiors were and that active mould growth was evident inside and on the backs of objects. This pointed to the necessity of an overview of the collection and also the disadvantage in concentrating on details without solving the over-riding problem. Consequently, a project with the working name of RTV - rengöring (cleaning), tillståndsinventering (condition reporting) and vård (maintenance) - was planned. This for the first time was undertaken in 1996 by conservators and curators, according to the procedures outlined below.

One room at a time is completely emptied of objects, after which ceilings and walls are cleaned of dust using brushes and vacuum cleaners. To reach all areas, scaffolding and work platforms are required. Electrical supply with a limited capacity is accessible only in a couple of places on each floor. Vacuum cleaners are fitted with HEPA-filters and long flexible tubing. The vacuum cleaners themselves are left on the floor, even if working at great height. All portable objects in the room are cleaned of dust and their condition documented on a form where conservation need is indicated according to a simple point scale. All walls and objects are photographed. Before returning the contents, all supports on hanging objects are made secure and the furniture is placed at a suitable distance from the walls to avoid creating pockets of increased humidity.

Traditionally, the tapestries have been mounted using metal rings on hooks. In the RTV project, they are therefore easy to take down and both front and reverse are vacuumed. There is also the opportunity to hang sheeting behind the tapestries in order to protect them against chalk-dust and other dirt from the walls. In recent years, the tapestry mounts have been examined and changed to incorporate solutions which allow a more even weight distribution and an easier evacuation in the case of fire. Some gilt leather and a few textiles have, however, been nailed directly onto laths mounted on the walls and must therefore be cleaned and cared for in situ. Often paintings hang directly on top of these. In the RTV process, these paintings are removed, which allows vacuum-cleaner access to both the gilt leather and the reverse of the paintings. To date, mould has not yet begun to grow on the gilt leather although it can be seen on the tapestries.

Work carried out has determined that the dust is collected more on horizontal surfaces, such as mantelpieces, table surfaces and the upper section of picture frames, but also where creases have formed in the gilt leather. In the corners of the ceilings, spider webs have built up and flies are attracted to the windows where they later die. While carrying out the RTV project conservators found tickets and other detritus from the 1900s in drawers and compartments, as well as under furniture, which implies that no one has moved or opened pieces of furniture for decades. In connection with the RTV measures, pest detritus has been monitored. The species found are mostly those that occur in Scandinavian fauna, such as museum beetles (Anthrenus sp.), fur beetles (Attagenus sp.) and domestic moth varieties. Despite the high humidity, no wood-boring insects have been found. Unfortunately, repeated attacks of clothes moth (Tineola biselliella) have been noted but...
these are sporadic and are probably affected by the winter cold. Today insect traps are used to systematically monitor ingress of insect pests.

Completion of the RTV-work gives the room a reference point, a particular date at which moment the condition of the contents is recorded. It can be concluded that the room is dust-free, stable and this makes it possible to determine whether any new insect or mould activity has begun. From a safety point of view, it is also valuable to gain a comprehensive overview of all objects within a room at one point in time.

Before the visitor season begins, guides and security staff are educated about the preservation of the building and its objects. These personnel then play important roles in the preservation work, where they explain to visitors how to behave in the building in order that it might continue to be on display for a further 300 years. These personnel also report if they find rubbish, insects or any damage to the building. RTV or housekeeping work in front of the public has been much appreciated, as visitors get the opportunity to pose direct questions about conservation and collection care. This has helped to illuminate the unseen aspects of work at the castle.

**Evaluating the project**

The RTV method has advanced the engagement of conservators in the collections and has stimulated other measures, such as the systematic monitoring of the interior climate, the registering of light ingress and the regular revision of local maintenance plans. The depth of knowledge has gradually increased and this experience is now being put to use in the organization’s other two museums.

The disadvantage with the method is that it is very time-consuming. After 14 years, only 17 rooms have undergone the RTV treatment. The intention is to be able to go through all the rooms in the castle in the foreseeable future. As so much of the work takes place on ladders and requires moving heavy and unwieldy furniture, it is necessary that two people work together. When possible, both conservators and curators have participated in the work, which has meant a transfer of knowledge across professional lines and between younger and older colleagues.

The RTV work has shown the need for revision of the daily cleaning of the museum’s interiors carried out by cleaning staff. The daily routine was first documented and then the methods and work practise were evaluated. This currently concentrates just on cleaning the floors. Tools and methods have changed with the accumulated experience. Wet cleaning is for instance almost totally abandoned, as it affects the relative humidity and can damage surfaces. Instead vacuum cleaners and modern cleaning equipment have proved easy to use and are effective. To complement the daily cleaning routine, conservators now undertake a general cleaning of the most visited interiors in the end of the public season. This cleaning is carried out during the autumn in order to remove as much dust as possible before the most humid period of the year arrives at the castle and thus reduces the risk that dust will be absorbed into porous materials. Dust from visitors accumulates around a level of up to 1.5 m [Lithgow et al, 2005]. Therefore, it is ensured that the autumn concentrates on removing the dust from that level and below. Additionally, the furniture covers are removed and shaken out.

Since the year 2000, the museum registers climate from data loggers, where data is transferred by radio signal to a central point. The system also makes it possible to register light levels in a room containing extremely valuable and fragile textiles. The monitoring of the climate has brought to attention questions about ventilation and whether air-flow has been occasionally too low. The ventilation has improved since the
chimneys were cleaned in 2002. This procedure used a Sky-lift and special suction equipment to remove 1.5 tonnes of debris, including bird droppings, from the chimney flues. In an ongoing university research project the castle’s climate and air exchange is being thoroughly studied over a two-year period. [1]

The earth’s climate has tended to become warmer and more humid over the past few years. This has been reflected by changes within the castle’s interior climate. Conservators have observed recurring mould growth in one room within a 10-year period despite thorough cleaning. However, they have also noted that the cleaning of the reverses of paintings has had a large impact in reducing mould growth in these places. Conservators have also learnt that cleaning of window panes must be included in the RTV work as the accumulated dust is a potential breeding ground for mould during humid periods.

The documentation forms used in the RTV process have been modified over time and in the future it will be possible to input the information directly in digital format into the museum’s collections database.

**Using the method in other museums**

Completed in 1898, the Hallwyl Palace is a stately home comprising 40 rooms in central Stockholm. It was built as a residence but also to house the owner’s collection of cultural and historic objects. It was donated to the Swedish state and since 1938 has been a museum open to the general public. The museum has almost as many objects as Skokloster Castle, about 50 000 in total. The interior floor area measures 1500 square meters in total. From the beginning, the Palace was equipped with clearly modern installations such as a central heating system distributing heat through warm air ducts. This still functions today but produces very dry air during winter. The palace was also equipped with electric lighting, something entirely new for Stockholm in the 1890s. The palace rooms were decorated with antiques and the light fixtures that were purchased had electric light bulbs. These fixtures still illuminate the museum but the electrical wiring has been replaced for safety reasons. The palace’s central location in an area of high vehicle traffic has for many years resulted in the ingress of air pollutants in the form of particles and reactive gases. Contaminants were already present 100 years ago, when it was discovered that the burning of coal in the city was unhealthy for the palace’s inhabitants. Of course, they themselves contributed to the interior contaminants due to their smoking of tobacco, traces of which can be found today!

The positive experience with the RTV work at Skokloster meant that the method was also introduced to the Hallwyl Palace. On many levels it has been easier to undertake the work in an environment which is better heated and illuminated and with much better access to electricity and water. Climate measurements have also been recorded at the Hallwyl Palace. Unlike Skokloster Castle, the Palace has a dry interior climate, 20-30% relative humidity, which prevents both corrosion and mould growth but contributes to extensive dryness damage on internal fixtures, furniture and paintings.

There are other differences between the two properties. At the Hallwyl Palace, the wall coverings are fixed behind narrow strips of wood, which makes them very hard to remove. They have therefore been cared for in situ. The dust has a different character at the Hallwyl Palace and notably contains more fatty substances than at Skokloster. The source of the dust here is most likely to be soot and contaminants from vehicle traffic. Despite this, similar cleaning methods with vacuum cleaners and brushes have been used here.

As at Skokloster, a tradition has developed concerning object care. Employees have been assigned specific tasks and cleaning equipment has been retained so that over time it has become part of the museum’s collection. The Countess von Hallwyl was aware early on of the importance of preventive care for her
collections. Therefore the house was equipped with jalousie blinds and protective curtains to prevent light from harming the collections and interiors. During the summer, furniture was protected with special covers, which are now themselves registered parts of the museum collection. [Lepp and Rennerfelt, 1981]

Figure 4: The museum staff dressed in period costume, with vacuum cleaner from the 1920s, today a museum object, the Hallwyl Palace. © Jens Mohr

The daily cleaning by cleaning staff at the Hallwyl Palace takes place more frequently than at Skokloster as the museum is open for visitors all year round. The museum educational staff are tasked with dusting certain surfaces with feather dusters every week. Protective matting has also been installed in large parts of the palace to protect the beautiful fitted floors from the wear caused by large numbers of visitors.

Conclusion

Conservators at Skokloster Castle and Hallwyl Palace have developed a strategy for maintaining as dust-free, and in the case of Skokloster Castle, mould-free, an environment as possible. This consists partly of thoroughly cleaning an entire room from floor to ceiling every year and partly developing a regular cleaning program. The work has progressed slightly differently in both museums because of different conditions and situations. Both historic buildings have a long tradition of collection maintenance and preventive conservation measures.
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Endnote:

[1] Gotland University and University of Gothenburg is undertaking a study in preventive conservation and climate control in Skokloster Castle as a part of a national research program on energy efficiency in historic buildings.

References:


Biographies:

Ann Hallström  studied art history at University of Uppsala, and graduated as Conservator from the School of Conservation, Royal Academy of Arts, Copenhagen in 1986. She is employed as paper conservator in the conservation department at Livrustkammaren, Skoklosters slott and at Hallwylska museet, Stockholm. (Department of conservation and photography, Livrustkammaren, Skoklosters slott, Hallwylska museet, Gustaf de Lavals väg 12, S-147 41 Tumba, SWEDEN, ann.hallstrom@lsh.se)

Erika Hedhammar  graduated from Göteborg University Institute with a degree in Conservation (1996). She has been previously employed as a textile conservator at the National Heritage Board of Sweden and at Livrustkammaren, Skoklosters slott, Hallwylska museet. She is currently employed as a preventive conservator at National Heritage Board of Sweden. (Swedish National Heritage Board, Department of Conservation, Box 1114, S-621 22 Visby, SWEDEN, , erika.hedhammar@raa.se)
Lisen Tamm graduated from the Institute of Archaeology, University of London in 1988. She has been previously employed as metals conservator and Head of the conservation department at Livrustkammaren, Skoklosters slott, Hallwylska museet. She is currently employed as metals conservator and Head of the Conservation department at the Royal Collections, Sweden (Department of conservation and photo, Livrustkammaren, Skoklosters slott, Hallwylska museet, Gustaf de Lavals väg 12, S-147 41 Tumba, SWEDEN, lisen.tamm@lsh.se)

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