Conservation of Chinese wallpapers – training and conservation

Anne van Grevenstein, Monique Staal

Abstract

The Limburg Conservation Institute organises the post-graduate training programme for historic interiors in the Netherlands and combines formal teaching with major conservation projects. During the training programme of 1993-1998 three complete sets of handpainted Chinese export wallpapers have been given conservation treatment and remounted on (partly) new supports. For their construction, maintaining of the traditional way of hanging was an important consideration for ethical reasons; from the viewpoint of conservation, however, some Japanese techniques were introduced, which resulted in combinations of Western and Japanese constructions.

Interdisciplinary collaboration between different paper and paintings conservators proved useful in finding new solutions for specific problems of remounting.

Zusammenfassung

Das Limburger Restaurierungsinstitut organisiert die fortgeschrittene Ausbildung für die Restaurierung von historischen Innenräumen in den Niederlanden und kombiniert herkömmlichen Unterricht mit bedeutenden Restaurierungsprojekten. Während des Ausbildungsprogrammes von 1993-1998 wurden drei vollständige Sätze handgemalter chinesischer Exporttapeten restauratorisch behandelt und auf zum Teil neue Träger montiert. Aus ethischen Gründen wurde die traditionelle Montierungsweise in Betracht gezogen, aus konservatorischen Gründen wurden jedoch einige japanische Techniken angewendet, so daß sich eine Kombination aus westlichen und japanischen Konstruktionen ergab.

Die interdisziplinäre Zusammenarbeit von mehreren Papier- und Gemälderestauratoren erwies sich als hilfreich bei der Lösung von speziellen Problemen bei der Neumontage.

Introduction

The training programme for conservators of historic interiors was developed in Maastricht in 1993. A basic training in paintings conservation was used as a framework that could be enlarged to various painted surfaces on different supports and in different settings. The seemingly wide distance between paper and paintings conservation allowing for major technical and ethical variations in attitude had been manifest in past decades in the field of historic buildings. Painted woodwork and panels, paintings on canvas, painted textile, painted paper were treated with strong "crafts related" techniques and traditional ways of thinking.

One would see wax relinings pursued with inevitable rigour by paintings conservators, and paper conservators treating wall paper with the same methods as those used for archival and printed materials. Expertise in the analysis of decorative schemes as an "ensemble" was very rare and sadly many interiors showed how damaging lack of interdisciplinary communication could be. These interiors had a marked tendency to fall apart aesthetically without careful tuning of the various parts of the decoration to form an ensemble. In the new post-graduate training programme, students - mostly architects or building historians - were taught to make educated choices after thorough analysis of the problems at hand and interdisciplinary orientation about the various solutions. During the programme a wide range of projects were undertaken by the Limburg Conservation Institute in order to get a thorough integration of the theory into the practice of conservation. It is the choice of these projects, the estimation of their relative didactic value and their integration into the training programme that constitutes the crucial element that transcends a normal production workshop. In all cases, we tried to study the whole interior and its relation to the building. The archives and historic sources were included as much as possible in the preliminary investigation of each conservation project.

The conservation of Chinese export wallpapers in the Netherlands

The treatment of three hand-painted Chinese export wallpapers in three different settings involved very different technical and ethical approaches. The projects started in 1993 and were completed in 1998 so that chronologically they fitted well into the training programme for Historic Interiors. From the viewpoint of a paintings conservator, the different attitudes of paper conservators towards authenticity, structural treatment of the paper and of the painted surface, the relation to the building structure and remounting, gave rise to stimulating interdisciplinary exchanges of knowledge and expertise.

In the context of the training programme it was relevant to invite guest-conservators with different backgrounds to tackle very different problems even if in all three cases we were dealing with Chinese export 18th century wallpaper.

The Heeswijk project was under the Danish flag with Nina Dahlstrom, a paper conservator in Brede, who introduced and further developed heat sealing methods on synthetic fab-

ric. It was possible to treat large wall sections in one piece and to remount them with hook and loop fastening bands ("Aplix").

The Huis ten Bosch project was a close collaboration between Philip Meredith, a British paper conservator working in Leiden and trained in Japan and TK. McClintock, a paper conservator in Boston and specialising in historic interiors. The wallpaper was separated along the vertical seams and detached from the Western support. The Japanese mounting system was applied but adapted to a western wall and with respect for it's historic authenticity.

In Oud Amelisweerd Philip Meredith worked in situ with Mark Sandiford, a British paper conservator specialised in historic interiors. The treatment involved extensive conservation work without disturbing the authentic structure of the European support.

Monique Staal, a Dutch paper conservator, who participated in all three projects, shall explain in detail the techniques used in each case. This chapter will focus on several new support constructed to re-hang the wallpapers. Firstly, light will be thrown on the structural treatment of the Chinese wallpapers themselves, which was, in broad outline, the same for all three. Then the new supports will be discussed for each wallpaper. For the choice of a new support maintaining of the traditional way of hanging was an important consideration. Therefore each discussion of a wallpaper starts with a brief description of the traditional support. This will be followed by a review of the considerations that played a part in the selection of a new support, after which the technical execution of the chosen construction will be explained.

Structural treatment of Chinese wallpapers

The main difference for the structural treatment of the wallpapers was the format of a piece to be treated, which ranged from 3,4 x 0,9 m ('normal' format; Palace Huis ten Bosch) to 3,7 x 4,3 m ('very large' format; Heeswijk Castle). The smaller size of the Huis ten Bosch wallpaper was due to the fact that the large sections were separated along the vertical seams into the original drops. The very large formats needed special provisions to remove the old linings and to make repairing, lining and stretching possible. Provisions developed were a working platform on the floor and a low, rolling bridge to reach the middle parts.

All wallpapers were first surface cleaned with a conservation vacuum-cleaner, brushes and/or chemical sponges and documented by tracing tears and losses on melinex. After a temporary consolidation of the surface where necessary, the wallpapers were turned over and the canvas, if any, was removed without the use of moisture. Hereafter the rag papers were removed dry. Moisture was used when needed, but not in fragile areas: here the rag paper was taken off during the damp treatment that followed. During this treatment tears were repaired with water-cut strips of Japanese paper and losses were filled with a Chinese paper similar to the paper of the image layer. Further two linings of Japanese paper were applied: first a mino paper, then (in the opposite direction) a sekishu paper. For all those procedures wheat starch paste was used as adhesive. Finally the wallpapers were dried overnight between felts or fibrefill. Still slightly damp the next morning, they were stretched. The wallpaper drops of Huis ten Bosch could be stretched on drying panels; the large format sections of the Heeswijk wallpaper, however, had to be stretched on the floor-covering (linoleum).

New supports for the wallpapers

Palace Huis ten Bosch wallpaper

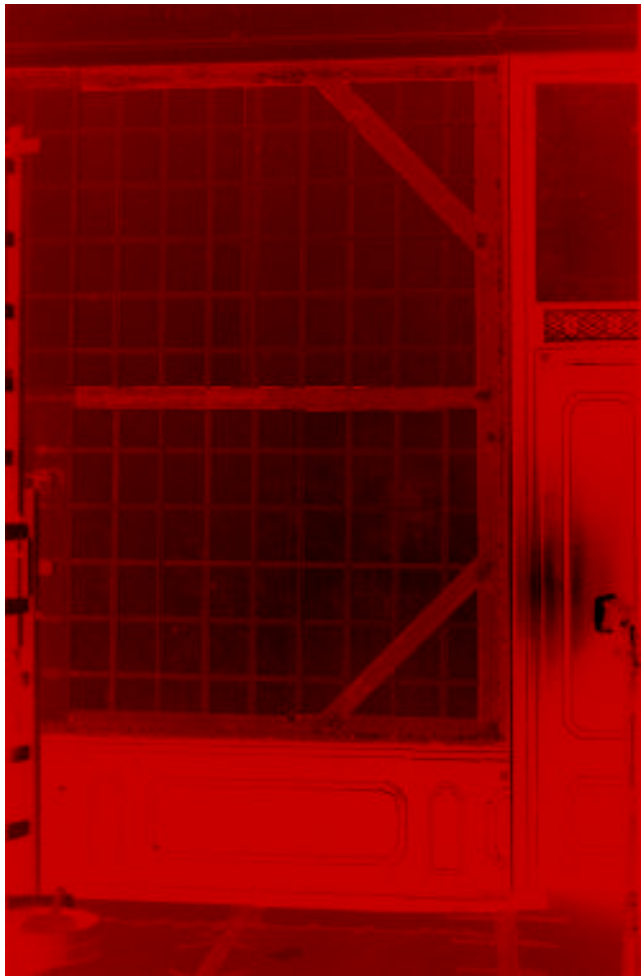

Fig. 1 Boards of plywood and lattice frames, both fitted within the original battens, cross members and corner braces.

Traditional way of hanging

Seventeen years before the conservation treatment in 1995 started, the wallpaper of Palace Huis ten Bosch had been taken off the wall because of a renovation of the building.

At that time the wallpaper was mounted on a stretched canvas, which was tacked to wooden battens at the edges. Those battens, in turn, were nailed to the plastered brick walls and strengthened with cross members and corner braces. As an interleaf printed rag paper (dated 1796 and 1804) was pasted to the canvas. The dates of the rag papers consequently meant that the wallpaper had to be mounted in 1804 at the earliest, in a time when it was quite common to use printed paper as interleaf. The whole mounting system as described, was the usual

Fig. 2 ***T.K. McClintock and Philip Meredith applying the final paper layer (ukeshibari) of the shitabari system.***

Fig. 3 ***Huis ten Bosch wallpaper after remounting.***

way of hanging for valuable Chinese wallpapers in the nineteenth century. This method had the advantage of protecting the hangings to some extent from damp and decay (Hoskins, p. 46).

Considerations in the choice of a new support

After the renovation of the building tile roofs, gutters, brick and inner plaster walls were in excellent condition. The room in Palace Huis ten Bosch where the wallpaper was to be mounted, was still in use as a reception room. Although the room was equipped with an air conditioning system, the relative humidity and temperature were subject to changes during receptions. Further it was desired to incorporate the original battens into the new support, as evidence of the original mounting format.

Several new supports were taken into consideration. From a historical and therefore ethical point of view consideration was given to a fabric stretched over the original wooden battens with an interleaf of Japanese paper. An advantage of this kind of support is the air space between wallpaper and wall, which provides a source of ventilation. However, such an air flow can bring physical strain on the wallpaper as well. Besides, this same air space makes the wallpaper vulnerable to denting and puncturing, which is not unimaginable in a (crowded) reception room. Holes and tears caused by this, are moreover difficult to repair in such a support. Finally, this hanging system is more susceptible to environmental changes which could cause slight distortions in the wallpaper. A support that could meet with the problems of denting and puncturing, was a system of rigid honeycomb panels. Nevertheless it was considered to render a surface too hard and flat and it would have little tolerance for alteration. Besides it would have necessitated that all drying occurred through the surface of the wallpaper during mounting. It was decided to remount the wallpaper on a system, based on Japanese panel mountings with under-linings of Japanese paper (shitabari). This was chosen because it was known to respond well to changes in climatic conditions and to cushion the wallpaper somewhat, making it less vulnerable to denting and puncturing. Even if torn it would be quite easy to repair. Moreover the system would give the wallpaper the appearance of being mounted on a fabric, stretched over wooden battens. A continuous surface with under-linings on one side was chosen rather than separate panels under-lined on both sides, because it would render a seamless surface and would fit more exactly within the original wooden battens.

Technical execution

To fit the original battens into the shitabari system, first the plaster wall was levelled by blocks of different thickness, so that the surface of the structure to be applied, would eventually be on level with that of the original battens. Boards of birch plywood [1], shaped to fit between the battens, were nailed to those blocks. Further, lattice frames with half-lap overlaps were fabricated of abachi wood [2]. They were assembled, using polyvinylacetate (PVAc) and rust-proof staples at the overlaps. This framework, also designed to fit within the battens, was secured to the plywood with PVAc and rust-proof tacks. This resulted in a firm and even grid, based on the size of the Japanese paper sheets to be applied.

The Japanese papers used for covering the lattice-work were all medium weight kozo papers and were all applied with wheat starch paste. The grain direction of the various paper layers alternated, starting with a vertical grain for the first layer. For this first layer (honeshibari) a machine-made

paper was chosen to apply to the framework. The second layer (dobari), meant to give strength and support to the under-lining, was composed of overall pasted, handmade paper sheets. For the minokake layer, sheets cut across the grain were joined together to form long horizontal strips. These were adhered as a triple shingle-layer to the wooden battens and to the dobari layer every 40 cm in between. This layer created air-pockets and cushioning. The fourth layer (minoshibari) was identical to the second, sealing the shingle-layer. The hereafter applied ukekake layers were constructed of quarter sheets, pasted at the edges and overlapping each other by 6 to 10 cm. This created a layer that facilitates separation of the wallpaper from the wall (when necessary in the future), besides forming air pockets and cushioning the wallpaper. As the final layer (ukeshibari) an overall pasted machine-made paper was adhered. This layer was needed to allow the wallpaper drops to be pulled loose for repositioning, something unavoidable during remounting.

Heeswijk Castle wallpaper

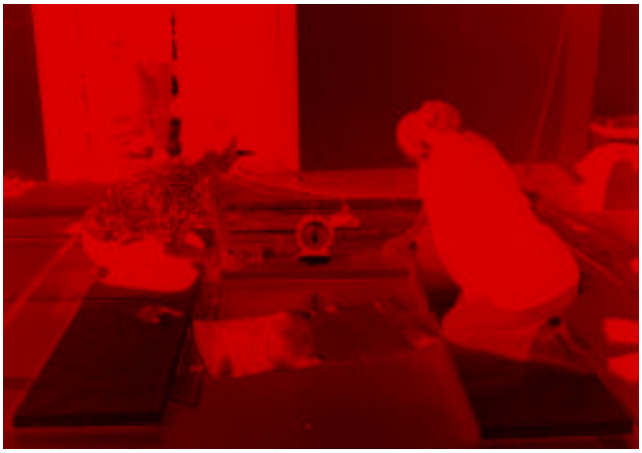

Fig. 4 ***Tessa Rietveld and Nina Dahlstrom are heat-sealing the wallpaper to the polyester canvas with an electrical heated mat.***

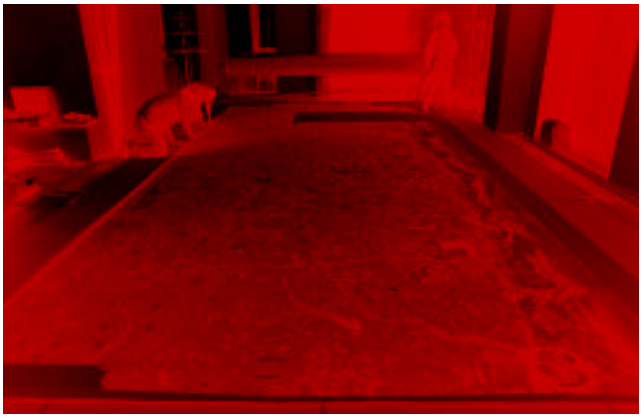

Fig. 5 ***One complete wall of the Heeswijk Castle wallpaper could be treated and laminated in one piece without separating the original seams.***

Traditional way of hanging

The wallpaper of Heeswijk Castle also had to be taken off the wall for renovation purposes, and because of the installation of an air conditioning system. Although the Chinese wallpaper concerned here is dated early nineteenth century, it appeared from sources that it was mounted not earlier than in 1879. The wallpaper was adhered directly to the wall, that is without a stretched canvas away from the wall. Nevertheless there was a kind of intermediate layer, namely another wallpaper with a floral design. This design was hand-block-printed on a continuous machine-made paper, which came into use for wallpapers in 1830. Therefore this wallpaper could be dated to the second quarter of the nineteenth century (Wodtke, p. 10). Printed taxation forms and newspaper sheets from 1836, served as an interleaf between this wallpaper and the plaster wall.

Fig. 6 ***Remounting the wallpaper with hook and loop fastening bands.***

Considerations in the choice of a new support

The Heeswijk Castle was intended to become a museum, but visitors were not to be admitted to the room. It was desired to develop a hanging system that would make it easier to reach the walls, in case the renovation of them turned out to be insufficient.

The original mounting of the wallpaper directly to the wall and the curved wall at one side of the room, made it necessary to choose a thin support again. A thicker support would have made

the room smaller and thus the wallpaper would no longer fit. Therefore the idea of using honeycomb panels or a Japanese panel system was set aside. However, to adhere the wallpaper directly to the wall, was also not desirable: it would make the walls 'inaccessible' and would not allow the wallpaper to respond to changes in climatic conditions. The idea of a mounting on fabric seemed to be most suitable. Access to the wall could be maintained by fastening the new support with hook and loop fastening bands (Aplix) to wooden battens, instead of tacking it.

Technical execution

It seemed impossible to adhere the large expanses of paper to a fabric with a water based adhesive, without causing large alterations of the size. Therefore it was decided to heat-seal the wallpaper under suction to a polyester canvas, a method used in painting conservation.

To achieve this, first of all the polyester was cut to fit for each wallpaper section. On one side the loop parts of the Aplix bands were sewn all round, about 1 cm from the edge. Some additional vertical bands were stitched on in between. Hereafter a mixture of Plextol D360/D541 (1:1) was put on the reverse side of the polyester, which was then left to dry for at least 48 hours. This adhesive mixture was selected because it could be activated at a quite low temperature to become sticky enough to create a good bond, without penetrating. Besides heat, pressure was indispensable for good adhesion. For this purpose a suction system was created on site. The wallpaper was stretched on the floor (face-down), the prepared polyester was placed with the adhesive side on top of this and the whole was covered with a heat resistant foil. The suction pump was turned on and the wallpaper was heat-sealed in small sections with a special heater. After this the laminate could be put on the wall by adhering the loop parts to the corresponding hook parts, which were attached to thin wooden battens on the wall.

Traditional way of hanging

The Chinese wallpaper sections on the outer walls of Oud-Amelisweerd had to be taken off. They had suffered from leakage in the past and the entire condition of the wallpaper/canvas laminate had become poor.

The traditional support found in Oud-Amelisweerd was in fact the same as that of Palace Huis ten Bosch: canvas stretched on wooden battens and lined with rag paper. A marked difference lay in the use of plain rag paper, which was more commonly used in the eighteenth century, as opposed to the nineteenth century when printed rag paper was more usual (see Palace Huis ten Bosch and Heeswijk Castle). This endorsed the assumption that the wallpaper, manufactured in the third quarter of the eighteenth century, was mounted in the last quarter of that same century.

Considerations in the choice of a new support

The room with the Chinese floral wallpaper and the other rooms located on the ground floor of the house, has a limited

Oud-Amelisweerd wallpaper

Fig. 7 ***The interior of Oud-Amelisweerd after extensive conservation treatment in situ***

museum function and can be visited on demand. Only during these visits the inner and outer shutters are opened, allowing daylight in with the corresponding changes in the climatic condition. The situation found in Oud-Amelisweerd was quite unique, because the wallpaper was still on the original support in the original location. It was desired to maintain and stabilise this situation as much as possible and so a restrained treatment was required. Therefore a support comparable to the original one was preferred; the limited use of the room gave no reason to reject this choice. As fabric polyester was selected, because it can absorb fluctuations in temperature and relative humidity for the wallpaper, is chemically inert and resistant to insect and microbiological attack (Doyal, p.62). The intermediate layer was derived from the shitabari system: an overall pasted paper layer, a pocket layer (ukekake) and a sealing layer. These paper layers enlarged the absorbent capacity of the support and cushioned the wallpaper slightly.

Technical execution

The polyester was stretched and tacked on to the original wooden battens with rust-proof staples. The adhesion between polyester and paper is a difficult one, but tests have

shown that a wheat starch paste/PVAc mixture in combination with Japanese paper could produce a good bond (Doyal, p. 63). To maximise the adhesion the polyester was roughened with a wire-brush. The first paper layer was composed of half sheets of kozo paper, pasted all over with a mixture of wheat starch paste and Mowilith (5%). The paper fibres were brushed into the weave by thorough and firm use of the nazebake. Then a single ukekake layer, made of quarter sheets of sekishu paper, was adhered with wheat starch paste at the edges only. Finally a sealing layer of kozo sheets, pasted all over with wheat starch paste, was put on. This layer allowed repositioning of the large wallpaper sections during remounting, without damaging the surface too much.

Conclusion

In all three cases, the conservation team consisted of students and interns from training programmes, Dutch paper conservators wanting to gain more experience in this field and recently graduated paper conservators. Although no so-called formal teaching was done in situ, I cannot help but think that the combination of elements had an outstanding didactic value. Opening conservation projects to students therefore seems a good way of complementing the formal training they receive because to exercise "problem solving" skills frequently requires them to find novel solutions to old problems. It is also a way of broadening horizons and of transcending unavoidable institutional habits or dogmas.

Trying to combine a training programme with the reality of major conservation projects is complex and one seems to be constantly fighting different time schedules and constraints.The discrepancy between the time consuming conservation treatments and the tight study programme of the students seemed at times impossible to conciliate.

For obvious reasons it is a heavy workload for students and teachers alike, but it has plenty of scope as a role-model allowing students to develop a vital sense of responsibility and an attitude that will prove useful in their later career.

Reference

1 Birch has been identified by the Central Laboratory at Amsterdam as being least acidic and least prone to off-gassing (Meredith, p. 42).
2 Abachi is a long -fibred, tropical softwood, light-weighted and low resinous (Woude, p. 8).

Bibliographies

Doyal, S., & Sandiford, M. 1995. 'Architectural linings and Backings'. *Lining and Backing*. United Kingdom, The United Kingdom Institute for Conservation, 60-66. ISBN 1-871656-25-7.

Hoskins, L. (ed.) 1994. *The papered wall*. London, Thames and Hudson Ltd. ISBN 0-500-23695-X

Meredith, Ph. a.o. 1998. 'The Conservation of the Chinese Export Wallpapers at Huis Ten Bosch'. Eagan, J. (ed), *IPC Conference Papers London 1997*. United Kingdom, The Institute of Paper Conservation, 34-47. ISBN 0-9507268-8-5.

Staal, M. 1998. 'De conservering van het Chinese exportbehang in de vogeltjeskamer' van Oud-Amelisweerd. *CARE*, 3: 13-24.

Wodtke, L. 1996. Die Restaurierung des chinesischen Zimmers des Wasserschlosses Heeswijk in den Niederlanden. College for Conservation of Artistic and Historic Works, Köln, Germany, Thesis. 80 p.

Woude, N. van der 1998. 'The conservation of historic chinoiserie interiors and Chinese export wallpapers in the Netherlands'. *Paper Conservation News*, 15: 6-9.

Biographies

Anne van Grevenstein (Antwerp 1947) was trained as a paintings conservator in Brussels and Rome.After working at the Central Laboratory in Amsterdam and at the Frans Hals Museum in Haarlem, she became director of the Limburg Conservation Institute in Maastricht.The first training programmes for paintings conservation (1990), historic interiors (1993) and modern art (1995) in the Netherlands were set up under her responsibility and this in close collaboration with the State School for Conservation in Amsterdam.

Monique Staal (Voorburg 1959) was trained as a paper conservator at the State School for Conservation in Amsterdam. Part of her training was gained in Kyoto and Tokyo. She participated in the three wallpaper conservation projects described in this paper. She is currently working as a free-lance (wall)paper conservator.

Contact address

Anne van Grevenstein
SRAL
Postbus 1679
6201 BR Maastricht
The Netherlands