

THE MURALS OF VAT BO PAGODA IN SIEM REAP STATE OF PRESERVATION – FIRST RESULTS

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1. Introduction

Vat Bo pagoda (figure 1) is situated in the town of Siem Reap in Central Cambodia. It is famous for its wealth of high quality murals (figure 2). The vihear walls are covered on all sides in three or four registers with scenes mostly from the *Reamker* (Cambodian version of the *Rāmāyaṇa*), but also with scenes from daily Cambodian life and colonial times, as was common in Siamese and Cambodian murals of that period (Leksukhum 2001; Giteau 2002).

It is difficult to reconstruct the history of the pagoda, because only very little reliable information is



Figure 1: Vat Bo Pagoda, vihear seen from west



Figure 2: Murals on the west wall

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available. Most probably Vat Bo dates from the 18th (Zepp 2000: 19) or 19th (Nafilyan 1997: 9) century. It is said that the pagoda was renovated in the 1940s. This work included heightening of the roof and plastering of the areas above and below the wall paintings. Whether the murals were also treated for preservation at that time is not clear.

Like in other Cambodian pagodas¹ damage can be observed in all parts of the paintings. But estimating the extent of degradation and risk of further damage requires a detailed survey of all paintings. Such a study was launched in the framework of the GACP by a group of students under the authors' supervision in summer 2002. The following contribution gives an overview of this study and outlines results concerning the murals' state of preservation and questions of conservation.

2. Documentation of Murals and Painting Techniques

Investigations began with a complete photographic documentation of the murals. On this basis, mapping documents were prepared. The next step was a comprehensive assessment of all technical details and careful mapping of damage. Analysis of all results led to recommendations for further research and preservation activities.

The study was performed using non-destructive methods exclusively. Therefore questions concerning the chemical composition of plaster, binders, pigments and later coating cannot be answered at this stage. Further research in this field is necessary, but this will depend on the availability of small representative samples.

The wall painting cycle is composed of many single scenes. The individual scenes of the *Reamker* are presented on the north and south walls in three registers, and on the western and the eastern walls in four registers. The scenes are not clearly separated and vary in size and number.

Doubts were raised as to whether the four registers between the doors of the eastern and the western walls are original. Painting technique renders it difficult to distinguish original painting from later painting and restoration without careful investigation (Boisselier 1976: 48).

The walls of the vihear are made from brick covered by two layers of plaster. Most probably this is a lime plaster. The plaster surface is not smooth. It shows small furrows and cavities probably caused by the smoothing process. The application of the plaster started at the higher parts of the walls, as can be seen at the two overlapping lines ("pontata") (figure 3).

According to Nafilyan (1997: 72) plaster substrates in Khmer pagodas of that time were typically applied in two main steps. First, a layer of hydraulic lime was used; this results in equalizing irregularities of the wall. After drying, a support was made from chalk according to a very difficult procedure (Boisselier 1976: 45). In the end the painters have at their disposal a very smooth surface without disturbing salts.

The painting itself was carried out in "secco" technique. The plaster was completely dry before the paint layers were applied to the wall. The binder used is still unknown but by analogy (Nafilyan 1997: 74) it can be assumed that it was made from a base of vegetable resins with a drop of egg white: "tempera". The same technique is also described from Thai murals (Ringis 1990: 95).

¹ See Giteau 2002, as well as internal GACP reports on the preservation state of Phnom Penh's Vat Phnom vihear (2003), and Kompong Tralach Leu vihear (1999) in Kompong Chhnang Province.

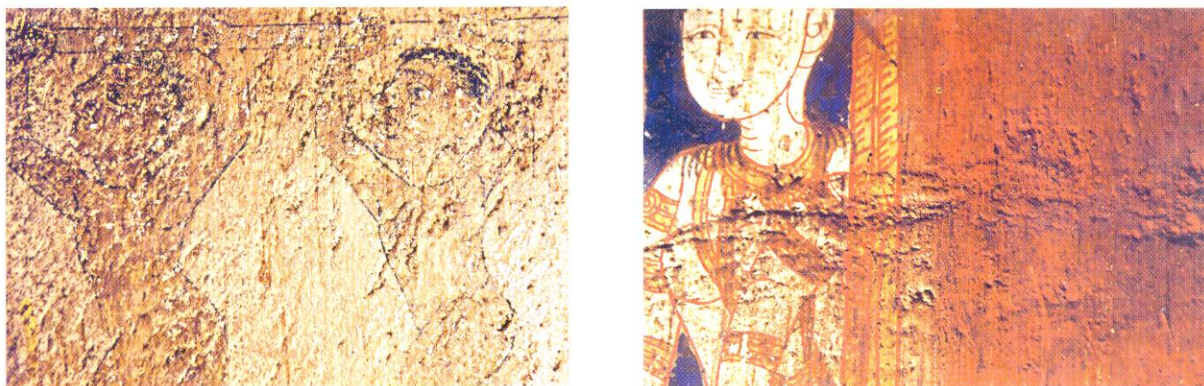


Figure 3: Furrows and cavities in the plaster (left), and joint of overlapping plaster ("pontata") (right)

It is obvious that the murals were later covered by a coating. Neither the composition of the coating nor the date of application is known.

3. Details of painting techniques

The smoothed plaster surface in Vat Bo is covered by a light wash which serves as ground for the designs. Preliminary sketches were carried out in black lines, using a ruler to make straight lines (figure 4). People and animals were painted using a brush and blue-black color. The preliminary sketches often lie on



figure 4: Fine drawings in black lines contour light background colors (left). Change of design visible in underlying sketches in black lines (right).

top of the light background colors: light blue, ocher, yellow and grey. After the objects had been colored, contours were stressed by very thin masterly brush strokes in black or red. Faces were obviously colored first, and then outlined in black. Trees are painted by bristled brushes in different colors. Details of the landscape such as rocks are rendered using thick brushes yielding thick and blurred contours. Not until the end were representational elements of dark backgrounds (black, red, brown, blue) added.

The style of the whole wall painting is quite graphic. There are neither shadows nor corporeal approaches. Even postures and decorations are stylized. There is no attempt to simulate correct puckering of the clothes. Siem Reap was more or less under Siamese authority during the 19th century, especially from 1867 to 1907. Siamese influence on the murals of Vat Bo is obvious.

4. State of Preservation of the murals

The murals exhibit a wide variety of damage. In larger areas the paintings are still stable, though there are also parts that remain highly endangered. Zones of risk are above all detached portions and areas adjacent to cracks. Water infiltration and animal droppings also threaten the paintings. Damage and its effects on the paintings are described in the following.

4.1 Detachment

The most serious problem is caused by detachment of large areas, sometimes extending from cracks (figure 5). Detachments occur mostly between the mortar and the brickwork. The two mortar layers, on the other hand, still adhere well to each other. Around 30 % of the painted area shows signs of detachment, but most of these parts are still stable. Two large detached parts measuring up to 60 cm² each are missing. Detachment appears more frequently close to new mortar layers that have been applied at the top and the bottom of the murals.

4.2 Cracks

All four walls show static cracks differing in length (figure 6), width and depth, some also extending from top to bottom. The bigger cracks measure a few centimeters deep and tend to be open; smaller displacements are visible rather through closer observation of the painting. Detached areas are often connected to cracks; mortar is sometimes lost at contact points. Remains of insect nests can be seen inside the cracks on the eastern and western walls. Some cracks have been repaired in former times. Micro cracks not of static origin also exist, but obviously do not cause major damage.

4.3 Water damage and thinning of the paint layer

Water intrusion caused by open or leaking roofs is a prominent damage phenomenon. In "secco" painting technique pigments are not very tightly bound to the underground and tend to powder. Water run-off stripes are commonly seen where the pigments are thinned (figure 7). The dark background colors are

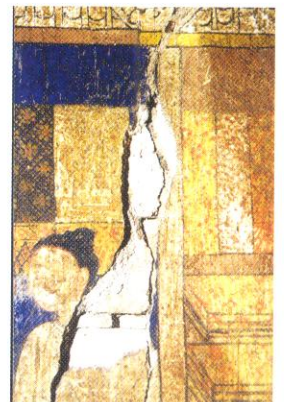


Figure 5: Detachment connected to a crack

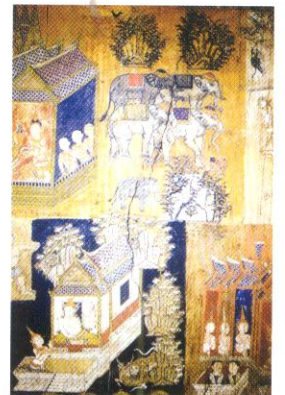


Figure 6: Cracks caused by static tension

most affected by thinning processes not necessarily bound to water infiltration and causing irregular aspects (figure 8). As pigments and binder could not yet be investigated, the reasons behind this damage remain unclear. Paint layers in general remain in fact in quite good condition. Isolated flaking zones and missing parts can also be observed. Scratches due to simple carelessness and affecting the paint layer are ubiquitous.



Figure 7: Water infiltration with signs of water run off and animal deposits

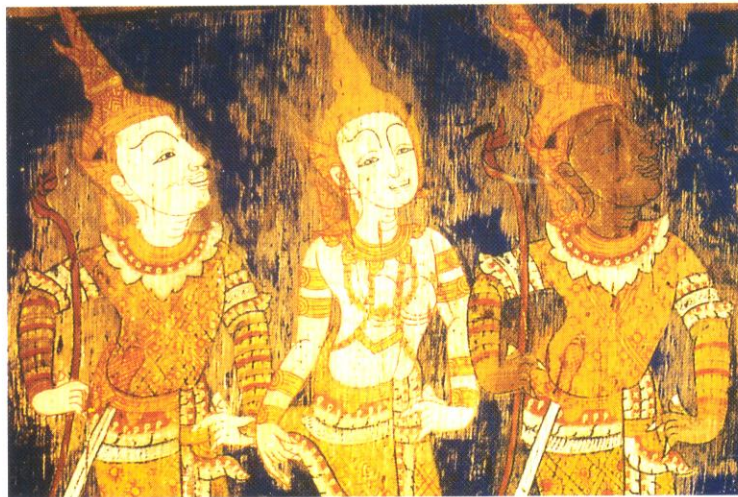


Figure 8: Thinned blue paint layer

4.4 Damage connected to renovation

Besides the loss of mortar and painting connected to cracks and detachments, neglect and carelessness constitute the main source of damage to the mortar and painting. Approach to the murals

appears to have been quite careless during renovation activities. Splashes of paint, mortar, cement and other materials are found all over the paintings (figure 9) and sometimes even disturb the overall impression. Some of this material has come off over the years, taking along with it the underlying paint layer. Electrical installations such as cables and switches have also been fixed to the wall, damaging painting and mortar. The removal of insect nests, that often adhere very strongly to the wall surface, has left deep scratches in the painting and underlying mortar. Hooks, around which new mortar is visible, have been inserted next to the doors. With careless handling these hooks have caused detachment.



Figure 9: Splashes of paint and mortar from former repair work

4.5 New materials

Renovation has often not been carried out in a professional manner. Additionally, unadapted materials have been employed. In the upper and the lower marginal zones of the murals we see large areas of new plaster and overpaintings (figure 11). In these areas the original paintings are missing. The overpaintings extend into the original painting with colors that differ considerably. Some parts in the middle of the painting have also been repaired with new plaster containing wooden dowels or nails.



Figure 10: Coating on the paintings; the red and yellow lines on the left show original bright colors

The whole wall painting is quite obviously coated with a glossy varnish, which darkened and disguises the originally much brighter polychromy, as can be seen in small "windows" where the varnish is missing (figure 10).

In some parts the coating has fallen off, taking along with it the underlying paint layer. The varnish was applied as a thick layer using a brush of around 7 centimeters. The brush stroke is still visible. The coating covers all overpainting, new mortar areas and splashes and is obviously of quite recent manufacture, perhaps connected to a restoration project accomplished around 1940.

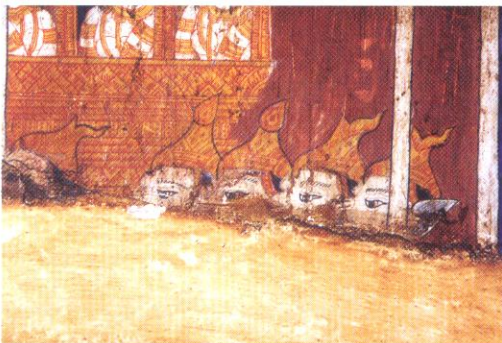


Figure 11: Plaster from former repair work overlapping the paintings (left) and uncovered painting under plaster layers (right)

5. Recommendations for Conservation

An absolute precondition to any decision concerning conservation is a detailed survey of painting techniques, painting materials (binders and pigments), underlying plasters and overlying coating. Comprehensive mapping of all damage and a classification of degree of deterioration would help to better gauge questions of necessity of conservation. The selection and development of appropriate and adapted conservation materials for pointing (stabilizing loose edges with a specially designed mortar), consolidation of paint layers etc., would enable conservators to establish a sustainable conservation plan for the murals. Considering the value of the murals, conservation, if deemed necessary, must be prepared and carried out by skilled specialists.

A conservation plan must cover the following steps:

- Estimation of active static movements
- Pointing and injection of detached areas
- Closing of cracks
- Consolidation of the flaking paint layer
- Removal or reduction of splashes
- Cleaning/removing of varnish if possible without risk for the murals
- Removal of iron parts
- Removal of cement
- Straightening of the ends of the wall painting with a neutral retouche

All steps of a preservation strategy for this precious testimony to Khmer history and culture must be in the hands of specialists aware of the value of the monument.

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