# Shuilu'an

## **Final report** Southern insertion wall



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Technische Universität München, Lehrstuhl für Restaurierung, Kunsttechnologie und Konservierungswissenschaft Research Institute for Conservation of Cultural Heritage of Shaanxi Province 陕西省文物保护研究院 Research Project 01 UG 1001 "German-Chinese co-operation in the preservation of Cultural Heritage: Researches for the conservation of selected monuments in the PR China"

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## INTRODUCTION

The conservation of the Shuilu'an near Lantian, 60 km southeast of Xi'an, is a project of the German-Chinese co-operation on the preservation of cultural heritage since 2000. The main hall of the temple is richly provided with painted sculptures, ranging from large Buddha and bodhisattva figures to tiny figures arranged in lively narrative scenes. Inscriptions inside the hall date the figures to the years from 1563 to 1567 in the Ming Dynasty. The Shuilu'an is one of the few temple halls with numerous polychrome clay sculptures and reliefs that have survived from this epoch in Shaanxi province. Their special importance lies in the fact that the major part of the figures has never been repainted, a situation that is rarely found all over China.

Practical work on-site for the conservation of the walls and the figures started in 2007, together with the examination of the techniques of construction, modelling and painting and material analyses. The work of 2007 focussed on problems of the west wall. In 2008 and 2009, clay-based grouting materials were developed and tested on the west wall. The results of the work in the years from 2007 to 2009 and a summary of the work in 2001 and 2002 are described in: *Shuilu'an Annual Report 2007 to 2009* (also as pfd file on: www.rkk.ar.tum.de > Projekte und Forschung > China-Projekt).

In 2010, the work for the first time did not focus on the rear part of the hall, but on one of the more complicated and richer decorated insertion walls. From August 20 to October 5, 2010, work on the southern insertion wall with the *kongqueling wang* and the *yaowang pusa* was carried out. At the request of Mrs. Yang Qiuying from the Research Institute for Conservation of Cultural Heritage of Shaanxi Province 陕西省文物保护研究院 (in the following abbreviated as *Shaanxi Institute for Conservation*), formerly Center for Conservation in Xi'an 西安文物保护修复中心, the work focussed on the examination of damage to the wall. Practical conservation work and research on paint layers and materials were not on the agenda. Nevertheless, conservation was done as far as they were urgent and could be executed besides the central aims of the work stay, and a number of observations on constructional aspects, painting and modelling were recorded.

The work team on-site consisted of Mrs. Dang Xiaojuan and Ms. Ji Juan from the Shaanxi Institute for Conservation, and for part of the time Mr. Yan Min; Ms. Gao Yan and Mr. Liu Dongbo were involved. C. Blaensdorf from the Technische Universitaet Muenchen (TUM), China Project, deputy leader of the German side of the Shuilu'an project; Sina Setzer and Milena Huber, students at the TUM, Chair of Restoration, and Ms. Kao Ching-mei, student at the Tainan University of the Arts, Restoration of Wall Paintings, Taiwan. On-site the work was supported by Mr. Zhao Liang and the employees of the temple. Ms. Liu Ming and Ms. Xu Yi from the University of Heidelberg, Institute of East Asian studies, visited the Shuilu'an together with the restorers for some days and helped photographing detached fragments.

The work-stay in China started on August 20. The first days were dedicated to the preparation of the work on-site and spent at the Xi'an Center for Conservation. Practical work in the Shuilu hall started on August 23. It ended abruptly on September 21 because of the new regulation of the military police forbidding foreigners to visit the Shuilu'an from September 22 on. Some interventions could not be finished for this reason. The collaborators from Germany and Taiwan still present until October, 6, spent the remaining days at the Xi'an Center to accomplish the evaluation, cataloguing and mapping of the obtained data, started during the work in the Shuilu'an (for the details, *see below: Work visit, Day-to-day record*).

The agenda focussed on the examination and assessment of the damage situation of the southern insertion wall. It did not include practical conservation work and research on paint layers and materials nor a comprehensive study of the building technique of the wall and the large sculptures. Nevertheless, repairs were done as far as they were urgent and could be executed besides the central aims of the work stay, and a number of observations on constructional aspects, painting and modelling were recorded as a sideline.

The work on the wall comprised surveying, measuring on selected points of the sculptures and reliefs, mapping, and collecting observations and information on the construction technique and the state of damage. For these purposes, a scaffold was built around the two wall faces. Changes and occurrences of damage to the wall surfaces and the sculptures were recorded in a comprehensive documentation. Before the survey was started, a time-consuming dusting of the wall sides was undertaken with paint brushes and vacuum cleaner. This was necessary to find and investigate cracks and other kinds of damage. Numerous fragments were found. Detached parts were taken from the wall sides. As far as their original positions could be identified, they were re-attached to the wall. If necessary, fragile parts were stabilised. The remaining fragments were catalogued and stored in ten cardboard boxes. The findings made between 2007 and 2010 meanwhile fill 44 cardboard boxes. A stable shelf with a metal frame was built and set up in the south annex building, now harbouring 42 boxes. Two boxes and some sculptures and fragments stored in the two wooden cabinets set up in 2005, are remaining in the hall, in front of the *kongqueling wang*. The findings were recorded in a list (69 pages) which is attached to the electronic version.

The main aspects of the results achieved in 2010 are the following:

1) A rather comprehensive understanding of the construction of the wall and the connection of the sculptures to the wall sides

2) Valuable insights into the technique of modelling and painting the sculptures and reliefs

3) The assessment of previous repairs, including the attempt at distinguishing the most important conservation period, that of 1981 (or 1980) to 1985, from previous and later interventions

4) Evaluation and record of the current situation of damage. The most serious problems are the damage to the upper part of the wall with the mountain area caused by constant penetration of water, and the serious tilt of the *kongqueling wang*; besides that numerous small sculptures, details of the modelling and fragile paint layers are endangered. On the *yaowang pusa* side, however, the situation seems to be mare stable. A problem not yet solved is the considerable damage caused by visitors touching the sculptures or throwing coins at them.

5) The canopy of the *kongqueling wang*: A discovery of special interest was made after two decayed cardboard boxes had been retrieved from the south annex building. They contained the broken parts of the canopy of the *kongqueling wang* which had fallen down in 1990 and was regarded as lost, and in addition several clouds and numerous parts of the mountains. After a first examination and an emergency treatment of endangered parts, the fragments were numbered, packed in new boxes and stored in the south annex building, together with the other findings made during this work stays (on the whole 20 cardboard boxes).

This report is based on the observations and notes taken by the German and Taiwanese restorers who also made the drawings of the survey. The sketches included in the text were made by the author. As far as no other references are given, the photographs were taken by the author or by the German team.

## **DESCRIPTION OF THE WALL**

The wall is inserted into the wooden post construction of the hall, spanning the bay (intercolumnium; in Chinese *jian*  $\exists$ ) between the first wooden upright (wooden column) of the south-west corner and the south wall (fig. 1). Lengthways the wall thus extends in north-south direction, while its two faces are oriented towards west and east.

The wall can be described as southern insertion wall, as it projects from the southern gable wall into the hall, separating it into a front and a rear part. The western wall face, belonging to the rear part, shows a sculpture currently designated as 孔雀翎王 *kongqueling wang* ("peacock feather fan king"). The bodhisattva on the eastern face, belonging to the front part of the hall, has been identified as 藥王菩薩 *yaowang pusa* ("Medicine king bodhisattva", in Sanskrit *Bhaisajya Rāja*). The identification of both sculptures is not assured, but they will be described by these names in the following. The counterpart of the wall (northern insertion wall) shows the Thousand-armed *guanyin* (west side) and a sculpture designated as *dizang pusa* (east side).

In 2001, the walls were labelled with abbreviations (southern insertion wall = PK / PY), and the big figures with numbers (*kongqueling wang*: 9; *yaowang pusa*: 10, fig. 1). The figures around the big sculptures, too, were numbered (fig. 18; *kongqueling wang*: PK 9.1-54; *yaowang pusa*: PY 10.1-25). The numbering includes only human figures, not animals or architecture parts. During he work stay in 2010, a numbering of segments was introduced in addition (fig. 17; *kongqueling wang*: tiers 1 to 6; *yaowang pusa*: areas 1 to 6).



Fig. 1

Ground plan of Shuilu hall (Shaanxi Institute for Conservation, 1993):

Abbreviations of walls (blue), numbering of big figures (turquoise), southern insertion wall (red)

Fig. 3 ► *Yaowang pusa* Situation before vacuum cleaning, August 2010

Fig. 2 *Kongqueling wang*, Situation before vacuum cleaning, August 2010 (montage of three photographs)





#### Kongqueling wang

The sculpture called *kongqueling wang* so far, possesses the characteristics of a Buddha, the head showing the typical protuberance (*usnisa*) crested by a round jewel-shaped tip. There is a second jewel at the beginning of the protuberance. His curly hair forms tiny "snail shell" spirals. His skin is golden. The mark on his forehead (*urna*) has the shape of a round pit. He is presumably sitting in the lotus position (*padmasana*), the left foot hidden under a bulge of the robe. He is dressed in skirt and robe (*kasaya*). In contrast to the bodhisattvas he does not wear jewellery or a stole, just bracelets. His left hand is lowered over his knees, the palm pointing upwards, the fingers stretched. His right hand is raised. The fingers were stretched out originally; the index and the little finger are broken off since 1983.

The *kongqueling wang* is sitting on a lotus seat in the shape of a flat bowl decorated with the petals of the lotus flower on the lower side. The lotus seat is carried by a big peacock. Between the seat and the back of the bird, there is a large pearl. The peacock is shown frontally, standing against the wall, the head raised, the wings spread sideward. The tail is raised into a fan which forms a nimbus around the *kongqueling wang*. Originally there was a canopy (in Chinese *huagai*) over the head of the *kongqueling wang*. It collapsed in 1990, leaving a large missing part on the wall. Besides the canopy, several big clouds and some parts of the mountains fell down (see below, chapter: *Fragments of the upper part and the collapsed canopy of the kongqueling wang wall*, p. 109-117).

The *kongqueling wang* and the peacock are surrounded by 45 standing figures arranged in tiers, comparable to the ones of the west wall. The tiers were numbered from top to bottom (tier 1 to tier 6) according to the scheme introduced for the west wall before. There are eight figures in each tier, four at the left and four at the right of the *kongqueling wang*. In tier 5 (second from the bottom) there are only six figures. The height of the figures in the two lowest tiers (tiers 5 and 6) is comparable to the ones of the west wall (ca. 50 cm). The figures in the upper tiers are smaller (tiers 1 to 4: 36 to 40 cm).

There are different types of figures: men (tiers 1 to 3), some with special hats or faces (fig. 7), twelve women (tiers 4 and 5, fig. 7), two monks (tier 5, fig. 8), eight *tianwang* or *lishi* (tier 6, fig. 9). The arrangement of the figures is symmetrical towards the *kongqueling wang*. The types are classified in table 1. Among the nine small sculptures in the mountains (21 to 25 cm high, fig. 4 and 5) there are men, *tianwang*, a woman carrying an infant on her arm (PK 9.8), and a *tianwang* with eight arms (PK 9.4).

The sculptures are standing on clouds. Underneath the lowest tier there is a ledge decorated with a twine-frieze ornament of the same kind as the one on the west wall.

Unlike the yaowang pusa, the kongqueling wang has no assistance figures.

(PK 9.5, PK 9.6, PK 9.9)



*Kongqueling wang:* mountains, northern (left) part (PK 9.1-9.4, PK 9.7; PK 9.8 on the right side is missing)







Fig. 7Fig. 8Fig. 9Kongqueling wang, tier 4Kongqueling wang, tier 5:Kongqueling wang, tier 6:lady with fruits (PK 9.39)Monk (PK 9.44)tianwang (PK 9.52)





Fig. 10 Kongqueling wang: cloud pedestal of tier 6 and twine-frieze ledge (northern part)

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## Table 1.Classification of figures around the *kongqueling wang*

## Yaowang pusa

The *yaowang pusa* has a golden skin. He is robed with skirt and *kashaya*. As it is typical of a bodhisattva, he is adorned with a crown, necklace and a stole. His hair is styled into a knot on the top of his head. His high crown is decorated with rosettes, cloud-shaped elements and a medallion of *Sakyamuni*. On top of the crown there is a construction of bead chains, including six large spirals and raising and hanging chains. His lowered left hand is holding a gourd, the middle and ring finger are closing around the lower bulb while the index and the little finger are stretched. His right hand is raised, the tips of the thumb and the index almost touching each other, the middle finger is also bent.

Rock columns separate the *yaowang pusa* from the rest of the wall, forming a slightly recessing niche around him. Originally a nimbus surrounding his body and a separate nimbus around his head were modelled on the background of the niche. He is sitting on a pedestal which consists of a base plate, a massive leg and a seat plate. The rectangular base plate is resting on ornate feet and decorated with open-work peony and cloud reliefs. The leg has an elliptical cross section and is designed as a bundle of mountains. In the centre, an animal, probably a tiger, is crouching between the rock columns.

The lowest part is a dais, 82 cm high and as wide as the wall, serving as a platform on which the *pusa*'s pedestal and two assistance figures are standing. Today the dais has a revetment of fired bricks (probably an addition from 1981-85).

The decoration of the wall can be divided into several areas: mountain scenery above the head and scenes with reliefs and sculptures in three levels on both sides of the *yaowang pusa*.

The *mountains* form the topmost part of the wall. 26 column-shaped rocks set next to each other fill the complete width of the wall. The *scenes* are arranged in three levels, each level showing two scenes: one left and one right of the *yaowang pusa*. The scenes of each level are comparable in design and content. Table 2 gives the numbering system of the areas installed in 2010.

Position	area		contents
	left side (south)	right side (north)	
topmost part	mountains		26 rock columns
upper level	area 1	area 2	fish pond scenes
middle level	area 3	area 4	pavilion scenes
bottom level	area 5	area 6	each of them with four standing men ("ten famous doctors ?")

Table 2.Overview of scenes surrounding the yaowang pusa

Areas 1 to 4 are set on terraces with richly decorated balustrades. The figures in areas 5 and 6 are standing on a cloud ledge. At the north end (towards the column), the scenes are framed by rock columns. Towards the south gable wall, there is no delimitation, and obviously the scenes spread out to continue on the western part of the south gable wall: Rock steps modelled on the south gable wall are leading to the scene in area 1, and from there another rock staircase raises to a terrace on the south gable wall. Eight of the "ten famous doctors" are standing in the areas 5 and 6, two of them are located next to area 5 on the southern gable wall (fig. 15).

#### Areas 1 and 2 (fish ponds)

Area 1 (left side, fig. 11) shows three men around a pond: one man (PY 10.3) on the right side is leaning forward, holding a fishing rod. Behind him another man (PY 10.2) is sitting in a tree, holding something on a stick (hammer ?, fish on a stick ?) in his right hand. On the left side, a man (PY10.1) is carrying a tree over his shoulders. In the front there is an object which might be a well. Inside the pond there are four big fishes and a small one, and two turtles.

Area 2 (right side, fig. 12) shows a house right of a pond. In front of the house a standing man (PY 10.6) is driving a saddled elephant while stretching out his left hand behind himself towards a plate that a lady (PY 10.7) is holding. The large plate is loaded with neatly piled up, round objects (fruits ?, bread ?). On the left side a man (PY 10.4) is holding up a fish on a stick, while another man (PY 10.5) is kneeling at his feet, hands raised, seemingly in desperate plea. Inside the fish pond, there are two fishes and two mixed creatures with human heads and fish bodies: In the upper right area, a fish man with cap and in the centre of the pond a fish lady with a girl's head.

#### Areas 3 and 4 (pavilions)

Both scenes show a central building, flanked by side buildings with open doors. The buildings are based on the same scheme, but differ slightly in dimensions and details, such as the decorations on the side roofs and the number of corbel brackets (*dougong*; in area 3 the main pavilion has three *dougong*, in area 4 there are four).

Area 3 (fig. 13) presents a scene with sick or poor persons. A skinny man (PY 10.8) is arriving from the left, exposing his bare chest. He is met by two healthy looking men, one coming out of the door of the left building (PY 10.9), the other one (PY 10.10) leaning at the left column of the central building. They are both holding plates. In front of the central building, a very emaciated man (PY 10.12) is kneeling on the right, supporting himself on a cane, his chest bare. Another man (PY 10.11) is kneeling opposite of him, his hands raised in prayer or plea. Within the central building, a man is standing behind a table (PY 10.15). He is holding an object which could be a balance, and there is a box next to him. Provisionally PY 10.15 was interpreted as "pharmacy counter".

In area 4 (fig. 14) all the figures are lost, so today it is empty. Originally there had been two persons sitting inside the central building, two at the open doors of the side buildings and two in front of the columns of the central building.

The figures numbered as PY 10.13 and PY 10.14 in 2002 are either lost today or they are the detached sculptures numbered as box 14-12 (torso, from area 3, maybe PY 10.13) and box 14-2 (lady, from area 4, maybe PY 10.14).

#### Areas 5 and 6 ("ten famous doctors"?)

Each of areas 5 (fig. 15) and 6 (fig. 16) contains a group of four standing men (PY 10.16-10.19 and PY 10.20-10.23). Some are old and have long white beards, others are young. Together with two similar figures on the adjacent part of the south gable wall (SG 7.57 and SG 7.58), they are interpreted as the "ten famous doctors".

#### Assistance figures

On both sides of the *yaowang pusa*, there are two relatively large sculptures of assistance figures or servants, numbered PY 10.24 (southern side) and PY 10.25 (northern side) in 2002. Both are standing. They are presenting something, their arms raised in front of the chest. They are wearing a robe down to the knees, a longer garment below and a white undergarment reaching down to the feet. Figure PY 10.25 is 96.4 cm high.

PY 10.24 is holding a bundle (white linen?) bound together by a cloth. A small gourd is tied to it. His head is missing. PY 10.25 is holding a thick book. Though the face of PY 10.25 is round, white and finely featured, the figure probably does not represent a woman, but a boy: he has short hair, clothes and shoes are similar to men's clothes.



Fig. 11 Yaowang pusa, area 1



Fig. 12 *Yaowang pusa*, area 2



Fig. 13 *Yaowang pusa*, area 3. In the central pavilion a man behind a table ("pharmacy counter" ?, PY 10.15)



Fig. 14 *Yaowang pusa*, area 4



Fig. 15 *Yaowang pusa*, area 5



Fig. 16 Yaowang pusa, area 6 head of assistance figure PY 10.25



Fig. 17 *Kongqueling wang*: Numbering of tiers (red) and positions of sculptures (green), lost canopy (red)

Yaowang pusa: Numbering of areas (red) and positions of sculptures (green)



Fig. 18 Numbering of figures (Scheder, July 2001). Animals and architectural parts were not numbered. Red x indicates a missing sculpture







# CONSTRUCTION OF THE WALL AND CONNECTION WITH RELIEFS AND SCULPTURES

#### Wooden post construction

The Shuilu hall is built in a classical wooden post construction: The uprights are wooden columns, on which the purlins and the roof are resting. Wooden lintels ( $\overline{M}$   $\overline{M}$  *lan e*, lintel or architrave) interconnect the columns in north-south direction. The hall is built in the system of the Ting-Tang post construction<sup>1</sup>, what means that the columns below the gable are longer than the ones at the eave sides (fig. 21). The two insertion walls are clay walls fitted in between two columns: the last column of the southern and northern bays respectively, and a column hidden in the outer (southern resp. northern) wall of the hall (fig. 19).

The column framing the southern insertion wall on its northern end (red in figs. 19-22), abbreviated as column SIWN (southern insertion wall northern end) in the following, measures 380 cm in height and 30 cm in diameter.<sup>2</sup> A lintel of 17.5 cm x 5 cm (height x width) connects it with the column in the southern gable wall. The lintel is inserted into column SIWN with a dovetail (fig. 22 a). The clay wall ends underneath the lintel. As the lintel was always hidden behind the reliefs it was never painted.



Fig. 22

Southern insertion wall: system of the post construction at column SIWN (not in scale)

a) Column with beams in west direction (purple), east direction (blue) and mortised  $\overline{m}$   $\overline{m}$  *lan e* lintels (orange) connecting the columns in north-south direction

b) Column with beam on top in east direction (green), panel (light orange) and saddle-shaped corbel element for purlin (brown)

c) Complete post system with slat (yellow) and purlins (pink)

Column SIWN (red in figs. 19-22) is connected to the next columns to the west and the east with beams. Two beams (purple in figs. 20-22) mortised into column SIWN connect it to the shorter column hidden inside the west wall. The connection with the longer column east of it

<sup>&</sup>lt;sup>1</sup> For the Ting-Tang post construction; see WEI 1999, p. 19.

<sup>&</sup>lt;sup>2</sup> The semi-circumference of the column was measured between 47 and 48.5 cm, referring to a diameter of 29.9 to 30.9 cm.

(yellow in figs. 20-21) consists of one beam (green in figs. 20-22) lying on top of column SIWN and a second beam mortised into the two columns at a lower level (blue in figs. 21-22). The end of the upper beam (laying on column SIWN) is flattened on the bottom side and round on the upper side (fig. 22 b). The top side shows a deformation which stems from the irregularity of the tree trunk.

On top of the upper beam (green in fig. 22), the purlin beams (directed north to south) are resting (pink in fig. 22). According to the architects' drawing of 1993 (fig. 21), the diameter of the purlins measures 30 cm. Between the beam and the purlins a saddle-shaped corbel element (20 cm wide) is inserted to stabilise the connection. Two beams of the purlin are meeting each other at this place (fig. 22 c): The purlins just span the length of one bay. Between purlin and lintel, originally a thin panel, 33 cm high, and, above it, a rectangular slat had been fitted in (fig. 22 c). The panel ends were inserted into a groove in the beam (figs. 24 and 23), the slat into a recess of the corbel element.

The construction inside the south wall could not be investigated. It can be assumed that it was equal to the one inside the hall, but it is not clear if the original wooden construction has been preserved. From the inside of the hall it is visible that the purlin is lying on fired bricks which were used in the restoration work during 1981-85 in order to repair the wall. It is not clear if the brick wall supports the purlin.

## Construction of the clay wall

The structure of the southern insertion wall could not be investigated in detail, because the inside is not accessible without damaging the wall faces. The removal of parts of the plaster replacements which had been made in 1981-85 along the column and the connection with the south wall, helped to understand the construction of the wall. The Chinese experts agreed to make small openings by drilling into the wall. This part of the investigation, however, could not be performed in 2010 for reasons of organisation, but can be done at a later time.

The wall is 365 cm high, ca. 315 cm wide<sup>3</sup> and 30 to 35 cm thick. At the foot of the wall there is a low base of four layers of *fired bricks*. The clay modelling and the paint layer of the white and black peacock pedestal overlapping the brick surface prove that the bricks are part of the original wall decoration. The bottom layer nowadays is half-hidden behind the floor tiles, showing that the original floor was slightly lower than the existing one. The bricks measure 36 cm in length and about 7 cm in height and are laid in stretcher bond. One layer, including the mortar, measures 7.5 to 8.5 cm in height.

In the lower part of the wall no joints and no layer structure are visible. It can be assumed that it was built of *rammed earth* and thus was constructed in the same way as the west wall: Above a lower part of rammed earth, the wall is built of adobe bricks.

Adobe bricks are visible above the head of the *kongqueling wang*, in the area damaged by the loss of his canopy. The adobe bricks measure 28 cm in length. The height varies slightly, with an average of 6.5 cm. They are all positioned lying, without standing rows like inside the western wall. From the top of the wall downwards, 11 layers of adobe bricks are visible; the lowest one is situated behind the neck of the *kongqueling wang*, ca. 280 cm above the floor. With 11 layers measuring 81 cm, the average thickness of layer with mortar is 7.36 cm, the mortar layer itself being about 0.85 cm thick.

The height of the rammed earth and the starting level of the adobe layers could not be ascertained. There is only one large loss of plaster in the lower part, next to the figure PK9.41 (tier 5, left side) at ca. 160 cm above the floor: No layer structures are visible there inside the wall. Thus, the wall in this height still seems to consist of rammed earth. At a height of ca. 230 cm, adobe bricks are visible in the south wall, next to PK9.40 (tier 4), but the south wall and the southern insertion wall do not have the same building technique.

It was not possible to find out if the adobe bricks were laid as stretcher or header, and thus if the thickness of the wall consists of one or of two rows of bricks. The joints of some adobe bricks continue from one side of the wall crest to the other, as if the wall consisted of only one row of bricks. At the top of the wall towards the *yaowang pusa* side, adobe bricks of a smaller size are visible, now lying loosely on top of the wall. They are irregularly shaped and positioned in front of the lintel plank. This could mean that smaller sizes or broken adobe bricks were used in front of the lintel, while the wall below was built of bigger bricks. If the adobe bricks were laid in header bond, their size can be estimated to be about 28 x 35 cm. If they were laid in stretcher bond, their size is about 28 x 17 cm. Both dimensions are different from the ones used at the west wall (about 24 x 41 cm).

At the wall crest (365 cm above the floor), shards of roof tiles are inserted between the wall top and the lintel (fig. 24). Broken roof tiles were also found between the wall top and the column-shaped rock formations rising above the level of the wall on the *kongqueling wang* side. Therefore it can be assumed that the roof tiles date from the Ming Dynasty.

On the *kongqueling wang* side, the original height of the wall is preserved: The rock columns are built up on top of the wall here. On the *yaowang pusa* side, there are several loose adobe bricks on top of the wall crest, maybe indicating that originally the wall was slightly higher

<sup>&</sup>lt;sup>3</sup> The original connections with the south wall and the wooden column are covered with later plaster layers today, so the width of the wall cannot be measured exactly.

here, maybe raised by one layer in front of the lintel. Above the wall crest there are several big pegs in the mountain scenery of the *yaowang pusa* which are sticking out into the air without contact to anything. They had served to attach something to the mountains which is lost today. The lowest pegs, protruding from the lower tip of the rock columns, are touching the wall about 8 cm below the wall crest. Obviously the upper pegs had never been inserted into the clay wall: for attaching the now missing parts, pegs driven through the straw bundles of the rock columns had been considered to be sufficient.

At the top of the wall above the head of the *kongqueling wang*, the wall is 35 cm thick. According to the measurements of the surveying, the wall crest is slightly thicker than the lower part of the wall: At the level of the shoulders of the big sculptures (ca. 270 cm above the floor) the wall is about 32 cm thick.

The wall crest does not show any sign of a vertical support system as an additional reinforcement inside the wall between the wooden columns. Old houses of peasants in the neighbourhood, too, do not have any additional support structures inside the clay walls, even if the walls are several meters high and wide.





View of the inner sides of the southern insertion wall, from the centre towards the northern end

#### ◄ Fig. 24

View of the inner sides of the southern insertion wall, from the centre towards the northern end: Wooden post construction, poles for support of mountain rocks and visible layers of adobe bricks.

## Connection of sculptures and reliefs with the wall

The inner support structure of the sculptures and the reliefs and their connection with the wall are mostly invisible. Therefore it was not possible to obtain a comprehensive knowledge on them. Only a few damaged or missing parts allow an insight into the inner structure.

## Big sculptures: Yaowang pusa and kongqueling wang

## Kongqueling wang

The *kongqueling wang* is 123 cm high, the peacock 133 cm. The jewel (the highest point of his head) is positioned at 312 cm above the floor. The *kongqueling wang* has no pedestal. The peacock is not carrying the weight of the sculpture. Thus it must be assumed that the lotus seat and the sculpture are upheld by the connection of their inner structure to the wall.<sup>4</sup> Two big pegs are visible in the back of the *kongqueling wang*. One is positioned at his lower neck resp the beginning of his back (284 cm above the floor), inserted below the 11<sup>th</sup> (or 12<sup>th</sup>?) layer of adobe bricks. It is wedge-shaped in cross-section, made of a log split into sections, the upper side measuring 6.9 cm, the height 5 cm (fig. 25). The lower peg is situated in the lower part of his body (ca. 190 cm above the floor). It is pointing downwards in an inclined angle, from the back of the sculpture through the lotus seat into the wall (fig. 26). From the lotus seat a small peg (diameter ca. 1.5 cm) points to the inside of the wall. The inner structure of the sculpture and the lotus seat could not be detected.

Behind the *kongqueling wang*, there is a recession of the wall or a cavity, into which a lump of clay-straw mixture protrudes from his back. The lump definitely is not a part of the wall, but of the sculpture. Probably the cavity was cut into the wall to increase the connection and the adhesion between the sculpture and the wall. The sides of the cavity do not show any discernible layer structure in the lower part, thus probably the wall consists of rammed earth here. A layered structure visible at the upper end of the cavity may indicate the beginning of the adobe bricks (about 250 cm above the floor).

The vertical axis through the bodies of the *kongqueling wang* and the peacock is not perfectly perpendicular. The head of the *kongqueling wang* is slightly inclined towards the north side (his right side). The difference between the axes through his head and the head of the peacock is 1 cm, but the head of the peacock is 5 cm to the right of the axis of his legs.

## Yaowang pusa

The *yaowang pusa* is 174 cm high (knee to hair knot, without tip of crown), the rock pedestal measures 73 cm in height and the dais 82 cm. The hair knot sticks up to 332 cm above the floor. The vertical axis through the sculpture is perfectly perpendicular, but the rock pedestal is slightly shifted to the south side (about 5 cm). No hint on the construction inside the sculpture could be detected. The connections to the wall and to the pedestal are hidden. The structure and the material of the rock pedestal and the dais are unknown. The stabilisation of PY 10.25 showed that below the feet there is clay material, probably pulverised adobe bricks, but the dais does not seem to consist of a compact block of adobe bricks, for there are larger voids inside the dais.

<sup>&</sup>lt;sup>4</sup> In September 2010, the clay plaster which had been used to close the gap between the *kongqueling wang* and the wall in 1981-85 was partly removed on the south side (left side of the sculpture). This allowed a limited insight into the connection between the wall and the sculpture. Due to the lack of time, an extensive investigation was not possible.



Fig. 25 View of the peg in the shoulders of the *kongqueling wang*, seen from above.



Fig. 26 The peg from the sculpture through the lotus seat into the wall is visible at the open joint between the sculpture and the wall

#### Architecture and mountain sceneries

#### Architectural parts

The inner structure of the terraces, pavilions, cloud ledges and twine frieze is not visible.

The twine frieze ledge of tier 6 (*kongqueling wang* wall) never was completely straight. The right (southern) side slopes about 8 cm in height towards the southern end. The artisans had been aware of this problem and added an adjustment zone: The mould-made cloud pedestal underneath the feet of the figures standing in tear 6, right side, were surrounded by hand-modelled cloud whirls which are missing on the left side of tier 6.

#### Mountain sceneries

The mountains on both sides of the wall consist of flat elements in the shape of pilasters or rounded mound-heads and of column-shaped rocks with a triangular peak. The mountains surpass by far the top of the adobe brick wall: the wall ends at 365 cm above the floor, while the mountain peaks reach up to 420 cm (*kongqueling wang* side) or 452 cm (*yaowang pusa* side).

For the modelling of the rock columns, bundles of reed were tied to and around wooden support poles which had been inserted above the level of the wall top. The strings for tying the reed bundles are optically identical to the hemp strings used at the west wall. On the *kongqueling wang* side, there is one pole inside the reed bundles (fig. 27: 1); it is positioned about 20 cm above the wall crest (top side of the beam) and measures 8 to 9 cm in diameter. It shows marks of being shaped with an axe, resulting in a polygonal shape in cross section and many visible axe marks along the faces of the polygon (fig. 29). It is attached to column SIWN with two rectangular iron pins (about 1 x 1 cm in cross section, fig. 31).<sup>5</sup> The upper edge of the pole is at the level of the top of the column (388 cm above the floor).

On the *yaowang pusa*'s side, there are two slightly thinner poles (fig. 27: 2 and 3). They are resting on the beam oriented in east-west direction (the bottom side at 416 cm above the floor). The mountains are modelled over the pole that is further away from the wall, while the one that is close to the wall does not have any obvious function. It is tied to the front pole with a thin rope and may have been considered as a support to the front pole (fig. 29).

The reed bundles were coated with clay and shaped into rocks. The clay coating is rather thin (1 to 2 cm). Above the top of the wall, the mountains on both sides are executed as open-work, showing smaller and larger perforations in the area between the wall crest and the support pole (fig. 32).

## Smaller sculptures

#### Assistance sculptures of the yaowang pusa (PY 10.25)

Both assistance sculptures of the *yaowang pusa* are loose, and their standing is unsteady. PY10.25 on the north side (97 cm high) was more unstable. He had been secured with wire to the rock columns in 1981-85. Before stabilising the sculpture in September 2010, the rubble underneath the feet was removed and the connection to the dais became visible.

Two wooden poles, made of a piece of wood split into sections, are protruding out of the shoe soles. For the production of the sculpture, probably the two poles were driven into the dais, both about 15 to 18 cm deep. Wooden pegs were used as wedges to stabilise the poles. They were cut off at the level of the shoe soles afterwards. The marks of a saw are visible on one peg. There are two pegs at the left foot, and one at the right foot.

<sup>&</sup>lt;sup>5</sup> They have the same dimension  $(1 \times 1 \text{ cm in cross section})$  as the iron rods of the canopy fragments.

#### Figures surrounding the kongqueling wang (PK 9.10-54)

The figures are comparable to the ones of the west wall. They possess one peg in the back (level of the scapulae) and one or two at the feet, depending on how they are standing: with the legs closed (standing men and women) or set apart (*tianwang* and *lishi*). In tiers 1 and 2 the pegs are inserted into joints of the adobe bricks. There are five layers of adobe bricks between the feet pegs of tier 2 and the feet pegs of tier 1. The clouds below the feet do not possess any pegs. The figures of tiers 5 and 6 are on a level with the sculptures of the west wall (46 to 50 cm), but those of the upper tiers (tier 1 to 4) are smaller (36 to 40 cm).

The pegs and iron poles used for supporting the canopy had also been driven into the joints between the adobe bricks.





Vertical section, view from the centre towards the northern end





View at the wall towards the northern end. The backsides of the rock columns of both sides are visible.

#### Fig. 29

View from the *kongqueling wang* side into the wall. In front: pole for supporting the mountains on the *kongqueling wang* side with facet marks of axe. Behind the pole: lintel of post construction with shards of roof tiles underneath. In the background, the backside of the mountains of the *yaowang pusa* side: bundles of reed tied to a wooden pole. The pole has sagged about 13 cm in the centre.



#### Fig. 30

View from above the wall crest downwards at the crown of the *yaowang pusa*. The pegs in the rock columns hanging in front of the wall are visible. The lighter yellow bundle of reed was inserted in 1981-85.

#### Fig. 31 (below)

*Kongqueling wang* side: Connection of support pole for mountains to column SIWN with two iron pins

#### Fig. 32 (below on the right)

*Kongqueling wang* side: Left part of mountains with open-work parts between wall crest and support pole







#### Introduction

The decoration of the southern insertion wall can be divided into three groups: the walls; the big sculptures made in the round and only connected to the wall with the back (*kongqueling wang, yaowang pusa*) or with the feet (assistance figures PY 10.24 and 10.25); the smaller sculptures which are part of the wall decoration. Together with the architectural elements, the clouds and the rock elements, the small sculptures form the surroundings and background of the big sculptures.

In September 2010, the focus of the work was laid on wall construction and damage. There was no time for a comprehensive examination of the individual small sculptures and details of the reliefs. Only some observations on the technique were collected. The connection of the sculptures to the wall is described in the chapter *Construction of the wall and connection with reliefs and sculptures*.

#### MODELING SCULPTURES, LANDSCAPE AND ARCHITECTURE ELEMENTS

It can be assumed that in principle the support structure inside the sculptures was made in the same technique as observed on the west wall: Pegs were driven into the clay wall, if possible into the joints of the adobe bricks. A core of wooden or bamboo sticks then was attached to the pegs, and maybe wrapped with hemp strings. Over this inner core, a clay-straw mixture was applied to form the rough outline of the body. The fine modelling was done in a mixture of clay, hemp fibres and sand. The larger portions of repeating ornaments and parts of figures were made in moulds. While the thicker and straight parts and limbs seem to posses a wooden stick as an inner core, thin unsupported parts or bent limbs (e. g. an elbow) were modelled around a wire. The fineness of the inner structure depends on the size and the shape of the figure or relief element.

## Big sculptures: yaowang pusa, kongqueling wang and assistance figures

There is no evidence of how the inner structure of the big sculptures is built up. At the figures of *yaowang pusa* and *kongqueling wang* only small parts are damaged seriously enough to reveal the inner core.

Wooden sticks and wires inside the fingers of the *yaowang pusa* protrude at the severed finger nails. Some sticks are straight and round (thin bamboo ?), others are cut in rectangular shape and bent (fig. 33). Wires can also be observed as the inner core of the stole (fig. 34). On the right side of the *yaowang pusa*, an iron nail is visible to which the wires of one end of the white stole are attached with fibrous material (fig. 35). The crown is a filigree construction based on wire cores. The wire serves as an inner core for chains of clay beads, decorative elements and pendants, but also as support construction. Support wires have a wrapping of a textile material (fig. 36). The big hairpins ending in a golden flower are modelled over a bamboo stick.

At the *kongqueling wang*, only the damaged fingers of his raised right hand expose the structure inside: there are wires visible inside the broken fingers.

The assistance figures which are about 1 m high, reveal only small parts of their inner structure: At PY10.24 (southern side) a thick wooden stick protrudes from the neck. At PY10.25 two rectangular wooden poles are visible inside the feet. It can be assumed that the

two parallel sticks in his legs are connected inside his body to a stick positioned in the centre of the body and the neck.



#### Fig. 33

Yaowang pusa, right hand: thin wooden sticks and wire protruding from broken finger nails

#### Fig. 35

*Yaowang pusa*, right side: Wire construction inside the stole attached to a nail with plant fibre strings





Fig. 34 Yaowang pusa, stole on left arm: wire core inside the stole

#### Fig. 36

*Yaowang pusa*, crown: Wires inside the different decorative elements on top of the crown



## Sculptures of 30 to 50 cm in height

The sculptures arranged in tiers around the *kongqueling wang* (PK9.10-54) are made in the same way as the ones of the west wall, following the technique described above. In the lowest tiers (tiers 5 and 6) the sculptures even have the same height as those of the west wall (i. e. 45-50 cm high). In the upper tiers (tiers 1 to 4) they are slightly smaller (36-40 cm high). The position of the pegs can be observed at the detached sculpture PK9.48 (tier 6, left side). Numerous missing heads expose the bamboo stick inside the sculptures.

The sculpture of a mule found on the dais of the *yaowang pusa* (Box 15-1) and assigned to the south wall (next to area 1) was modelled in the same way: One long peg is protruding from the back of the body. Smaller sticks are positioned inside the legs and the neck (either bamboo or wood). A wire was used to connect the head with the neck.

The "10 famous doctors", eight of them in areas 5 and 6 next to the *yaowang pusa* and two on the southern gable wall, are also made in this technique. Their height (50 cm) is comparable to the sculptures of the west wall, but unlike those they are modelled in the round. The upper pegs are inserted at a rather low position at the level of the thighs. Between the sculptures and the wall, the pegs were encased in a layer of clay (fig. 37). The low position conceals the presence of the pegs for an observer standing in front of the wall, but it is a disadvantage regarding the stability of the sculptures.



Fig. 37

*Yaowang pusa*, area 6, four of the "ten famous doctors" seen from above. A stem-shaped clay encasement conceals the wooden peg. All the figures have slightly tilted forward due to the low position of the pegs.

## Small figures

There are small figures in the mountain scenery of the *kongqueling wang* side (PK9.1-9.9) and on the terraces of the *yaowang pusa* side. The standing figures measure 21 and 24 cm, some of them on the *yaowang pusa* side being slightly taller. Unlike the sculptures of 30 to 50 cm in height, the small sculptures were not modelled on the wall, but made separately and attached afterwards to the wall with blobs of clay. They are flat on the back, showing parallel grooves or scratch marks. They were modelled on a flat surface, from which they were slid off sideways. On the back of the man behind the "pharmacy counter" (PY10.15), an imprint of a wooden panel is visible with discernible annual rings (fig. 43). A thin hard pole of wood (or thin bamboo ?) runs vertically through the body and the neck into the head. It does not protrude at the feet.

For the man carrying a tree, the fisherman in area 1 and a tree at the left end of area 4, twigs of real trees were used for the trees and the fishing rod (fig. 40 and 39). They were not covered with clay or painted. The tree in which a man is sitting (area 1), possesses a wooden core, probably also a natural branch, but is coated with clay (fig. 39, behind fisherman).



Fig. 38 *Yaowang pusa*, area 1, man carrying a tree: real branch



Fig. 40 *Yaowang pusa*, area 3, small figure with flat back



Fig. 41 *Yaowang pusa*, area 3, small figure with flat back



Fig. 39 *Yaowang pusa*, area 1, fisherman: real twig





Fig. 42 Detached sculpture of a lady (from south gable wall ?): flat back from modelling on panel



Fig. 43 Yaowang pusa, area 3, back of the man at the "pharmacy counter" (PY10.15), detail of back: imprint of wooden panel; finger marks on the lower edge

#### Architecture and mountains

The backside of the rock columns protruding above the top of the clay wall is visible because of the large loss in this area on the *kongqueling wang* side: The substructure consists of bundles of reed. There are few damaged parts on the rock columns subdividing the *yaowang pusa* wall. Inside the damaged tip of the rock column between area 2 and the column, reed is visible underneath the clay modelling. In a lower mountain tip next to the southern end (rock column no. 1), straw (coarse additive of clay ?) is recognisable.

The inner structure of the architecture is not visible. Inside the broken terrace of area 1, coarse fibrous particles are visible which are not imbedded in clay plaster. Probably the inner core of the terrace consists of a bundle of reed or straw, similar to the substructure of the rock columns.

Behind the mould-made parts of the pavilions, clay with straw is visible, indicating that the rough shape on the wall was modelled in a clay-straw mixture to which the mould-made elements were applied. Wooden sticks protrude from the hips of the roof wings (area 4); they probably supported the bent ridge of the roof wing. Small wooden sticks are visible inside the roof decoration, attaching the tiny globes, cloud spirals and birds.

The dragon on the rock column between area 3 and column SIWN contains numerous wires protruding from the snout, pointed teeth, whiskers and spikes.

#### Elements made with moulds

So far, the use of moulds could not be investigated in detail. A thorough examination requires a lot of time because the soft, freshly produced element can easily be deformed and the state of preservation varies considerably. The following observations have thus to be regarded as a preliminary information and interpretation.

Table 3 gives an overview of parts made in moulds or modelled by hand. The big sculptures and their pedestals were modelled by hand. In the surrounding scenes many mould-made elements were used as parts of the figures and for the clouds. Like on the west wall, cloud ledges and twine-frieze were assembled from mould-made elements. On the *yaowang pusa* side, many parts of the architecture were made by moulds. This kind of mass production of segments allowed an efficient and speedy progress of work and still a rich variety of fine details.

Some elements could be used for different purposes like the parapets which re-appear as decorations on the pavilions and the "pharmacy counter". Parts of armours could be variously combined for the outfits of the *tianwang* which thus all are dressed differently.

There were several moulds for the same elements, not only to produce different types of faces or limbs, but also of architectural elements. They have the same design including complicated patterns, but differ slightly in size or details. Obviously the same moulds were used on the west wall, the Thousand-armed *guanyin* and the *kongqueling wang*, whereas the equivalent elements of the *yaowang pusa* wall were produced in different moulds.

The faces of small and medium-sized figures (fig. 44) were made with a number of different mould-made types like: young, smooth and smiling; emaciated and old; grim with bulging eyes etc. Figures of the *kongqueling wang* side and the *yaowang pusa* side have the same dimensions (20-25 cm high and 35 to 50 cm high), but probably different moulds for the faces were used for each side.



Fig. 44 *Yaowang pusa*, area 2, kneeling man: visible joint along the mould-made face.

The use of almost identical, but nevertheless different mould-made pieces can offer clues concerning the work process: Maybe the primary design was defined in sketches or models which were then reproduced in several master copies for moulds. Presumably several teams of craftsmen were working on the single walls as independent teams: This would explain the fact that no exchange of mould-made parts between the west wall and the *kongqueling wang* wall on the one hand and the *yaowang pusa* wall on the other hand can be detected. The similarity of many decorative parts and the arrangement of the reliefs leads may be an evidence for the supervision by a master who was responsible for the general design.

#### Table 3.

Overview of production technique of the sculptures and reliefs (hand-modelled and made by moulds).

Made by mould	
kongqueling wang	yaowang pusa
<ul> <li>peacock feathers</li> <li>canopy: "eave tile" decoration, rosettes, double-spiral clouds</li> <li>medium-sized figures: faces (different types), parts of robes, shoes, hands, ears, caps, parts of armour of <i>tianwang</i></li> <li>small-sized figures: faces, parts of robes ?, armours or armoured figures</li> <li>clouds</li> <li>twine-frieze</li> </ul>	<ul> <li>pendants and ornaments of the crown: <i>Sakyamuni</i> medallions, rosettes, pendants, pearl circlet at the base of crown</li> <li>medium-sized figures: faces (different types), parts of robes, lower part of robes with shoes, hands, ears ?, some of the caps</li> <li>small-sized figures: faces (including fish-man and fish-lady), parts of robes ?</li> <li>big fish in the fish ponds, including the bodies of fish-man and fish-lady</li> <li>parapets</li> <li>pavilions: animal heads as roof decoration, rosettes on ridges, dragons on ridge ends (<i>chi wei</i> 鸱尾), eave tiles, capitals of the columns, pilaster decoration behind the columns, door wings</li> <li>clouds</li> <li>decoration of the base of the rock pedestal: twine-frieze, decoration of feet, pearl frame, frames of part below the table-shaped base plate</li> </ul>
kongqueling wang	vaowang pusa
<ul> <li>sculpture of <i>kongqueling wang</i></li> <li>canopy</li> <li>lotus seat</li> <li>peacock</li> <li>rock columns and mountain reliefs</li> <li>individually designed parts of sculptures like attributes, special hairstyle and headgear, parts of clothes, and maybe the arms</li> </ul>	<ul> <li>sculpture of <i>yaowang pusa</i></li> <li>decoration of crown: clouds, flowers and beads</li> <li>rock pedestal and tiger</li> <li>assistance figures</li> <li>rock columns and mountain reliefs</li> <li>individually designed parts of sculptures like attributes, special hairstyle and headgear, parts of clothes, and maybe the arms</li> <li>elephant, small fish, mule</li> <li>pavilion: columns, corbel brackets, beams, columns</li> </ul>

## Mediums-sized sculptures

Most of the surface modelling consists of mould-made parts. Single elements can be identified because they are repeating at many sculptures, but the exact shape of the individual parts or their borders often are not clear yet. The following parts are definitely made by moulds: Faces (as a mask-like part), ears, caps and hats, hands, hanging sleeves, waist clothes, robes covering the lower part of the bodies (waist to knee), undergarment (knee to floor), shoes; the parts of the armour of the *tianwang*, including legs and arms; legs of *lishi*. On the

*kongqueling wang* side, probably the same moulds were used as at the west wall: The sculptures in tiers 5 and 6 have the same height as the ones on the west wall (about 50 cm), and the parts of the robes show the same characteristics. The faces cannot be compared as all the heads are missing (except for the individually modelled face of the *lishi* PK 9.54). The parts of the robes of the smaller sculptures in tiers 1 to 4 (36 to 40 cm high) also seem to have been produced with the same moulds as on the west wall (fig. 45 a-c). The faces show the same type of features - a thin nose with a narrow bridge from which the eyebrows are curving into a high bow, a small mouth with full, curved lips and small pouches under the lower eyelid -, but it is not sure that the same mould was used: The sculptures of the west wall possess a distinct ridge around the lips, which is not visible at the ones of the *kongqueling wang* wall, and more slanting eyes (fig. 46 g-i).

The medium-sized sculptures of the *yaowang pusa* side, i. e. the "ten famous doctors" in areas 5 and 6, were also combined from mould-made parts. Nine of them are wearing the same type of clothes with identical details of the folds. The preserved seven heads seem to be made in two different moulds (young and old face). The sculptures are very similar to each other, but different from the ones of the *kongqueling wang* side and the west wall (fig. 45). They differ in the facial features, the build of the bodies and the arrangement of the folds. The "ten famous doctors" have big heads; the faces are flatter and broader, they show a broader nose and mouth (fig. 14 a, d). The lower part of the bodies is very slim and the feet are so tiny that these parts may have been designed for much smaller figures (fig. 45d-f).

## Small sculptures

The small sculptures were modelled apart from the wall. Moulds were used for the faces as visible joints on the sides of the heads prove (fig. 44). The faces are very similar to each other. On the *kongqueling wang* side, the young round faces come from the same mould (fig. 47 a, b). The grim, reddish brown face of PK 9.4 (fig. 48 c) may come from another mould or may be modelled by hand. On the *yaowang pusa* side, the figures are part of narrative scenes and possess different postures and types of clothing. All preserved faces seem to be made by the same mould, serving for men and women (fig. 47 d-e). The faces are characterised by flat, broad faces, narrow, long eyes and a mouth which appears to be slightly opened. Definitely they were not made with the same mould as the faces on the *kongqueling wang* side. Only the head of the fish-man in area 2 (fig. 47 c) bears a certain resemblance to the figures of the *kongqueling wang* side. The similarity could not be investigated in sufficient detail to prove if they come from the same mould. If they do, this would be the first and only case, known so far, of the use of the same mould on the *kongqueling wang* side show a striking similarity in posture and structure to the armour parts (armour plates or quilted fabric). Maybe the

sculptures were made by moulds which contained the greater part of the body (fig. 48 a-d). Maybe just details as the decoration of the belt, the animal hide hanging down in front of the belly, the clothes worn over the armour were added by hand.

## Peacock feathers

The mould-made feathers show the top part of the feathers including the eye (22 cm long, maximum width at the eye: 8 cm). They were applied overlapping in four circles around the *kongqueling wang*. Only the small feathers next to the pearl (below the lotus seat) are modelled by hand.



a. PK 9.20 (40 cm high) Kongqueling wang wall, tier 2, left side



d. SG 7.57 South gable wall, next to area 5, standing "doctor"



b. PK 9.21 (41 cm high) *Kongqueling wang* wall, tier 2, left side



e. PY 10.17 (50 cm high) *Yaowang pusa* wall, area 5, young "doctor"



c. W 4.74 (ca. 48 cm high) West wall, section 1, tier 4



f. PY 10.18 (50 cm high) *Yaowang pusa* wall, area 5, old "doctor"

#### Fig. 45

Comparison of medium-sized figures around the kongqueling wang, the yaowang pusa and on the west wall


a. PY 10.17 Yaowang pusa wall, area 5



b. PK 9.13 (40 cm high) Kongqueling wang, tier 1, left side



c. PK 9.15 (35 cm high) Kongqueling wang, tier 1, right side



d. PY 10.19 Yaowang pusa wall, area 5



e. PK 9.29 (41 cm high) Kongqueling wang, tier 3, left side



f. PK 9.31 (39 cm high) Kongqueling wang, tier 3, right side



g. W 4.48 West wall, section 2, tier 4



h. W 4.51 West wall, section 2, tier 4



i. W 4.68 West wall, section 1, tier 4



Faces of medium-sized figures around the kongqueling wang, the yaowang pusa and on the west wall



a. PK 9.5 Kongqueling wang side



Kongqueling wang side



c. Fish-man *Yaowang pusa* side, area 2



d. PY 10.4, man with fish on stick *Yaowang pusa* side, area 2



e. PY 10.5, elephant driver, and PY10.6, lady *Yaowang pusa* side, area 2

c. PK 9.4

### Fig. 47

Faces of small figures around the kongqueling wang and the yaowang pusa

#### Fig. 48

Small figures of *tianwang* in the mountains above the *kongqueling wang* 

a. PK 9.1





d. PK 9.7



# Clouds

All the clouds were made by moulds. On the *kongqueling wang* side, there are two different types of clouds. The clouds in the mountain relief consist of four small cloud whirls and a long tail, while the clouds underneath the tiers have two large spirals of the same size. The clouds in the mountain area are longer and slimmer (full length 36 cm, height 8-9 cm) than the ones in the tiers (length with tail 28, height 9-11 cm). In the tiers, only the first clouds on the north end have a tail. The tails of the other clouds are cut-off in order to achieve a continuous cloud band (length of double spiral 21 cm).

On the *yaowang pusa* side, there are only few clouds, all of them on the rock column next to the wooden upright north of the wall. Four clouds are positioned below the dragon next to area 4. Their design resembles the one of the clouds with small whirls used occasionally on the west wall (for example below the frame between the heads of W 4.57 and W 4.58), but they come from another mould.

# Twine-friezes

The design of the twine-frieze on the base of the *yaowang pusa*'s pedestal is identical to the twine-frieze ledges underneath the figures of the west wall and the *kongqueling wang* side: The mould-made parts contain a pattern of a full bent and two halves; the joints are concealed underneath the flower on the twine bent clockwise. Nevertheless the two twine-friezes of the Southern insertion wall were made in different moulds, as the considerable differences in the dimensions proof. Moreover, the frieze on the *yaowang pusa*'s pedestal is made as an openwork. Tab. 4 shows the dimensions of one mould-made part.

# Parts of architecture around the yaowang pusa

The parapets of the terraces were assembled from three mould-made elements: the parapet with two rows of panels, a band of gilded beads, and a row of heart-shaped, green eaves tiles (fig. 49). Each parapet element possesses a taller and a lower pinnacle and four panels. In the band of beads, joints of the single mould-made segments were not visible. Each eaves tile segment contains five heart-shaped tiles. The red band above the green eaves tiles was part of the same mould.

The elements of the parapets were also used as decorations of other parts. The front of the "pharmacy counter" in area 3 is made of a segment of the parapet placed upside down (fig. 49). The top part of the parapet with the pinnacles was used as decoration of the side buildings underneath the roof tiles.

The ornament with the green panels reappears as a pilaster decoration behind the pillars of the central pavilion (fig. 50). The same element was used as a small parapet on top of the base plate of the rock pedestal (fig. 51). The decoration of the pilasters and of the pedestal base is identical in style and dimension to the parapet, but it was made in another mould which only contained that one row of panels.

# "Eaves tile" decoration

The parapets of the terraces show a row of heart-shaped elements as the lowest part of the decoration. Besides this main use as eaves tiles, this type of decoration reappears on the framed cartouches of the west wall, on the canopy of the *kongqueling wang* (picture in table 5) and the *baoshen fo*. The comparison of different "eaves tile elements" used in the rear part, on the insertion walls and next to them proves that several moulds were used.



### Fig. 49

*Yaowang pusa* wall, area 3, parapet: dotted lines mark the borders of the mould-made elements. The "pharmacy counter" in the central pavilion and the side building with roof decoration (white arrows) are made with the same mould as the parapet.

### Fig. 50

Yaowang pusa, area 3, pilaster decoration







Position	Length	Height	Picture
West wall / kongqueling wang / 100-armed guanyin ledge below sculptures	12-13	27-28	
Yaowang pusa base of seat pedestal	9-10	20	

#### Table 4.

Twine-frieze decorations, dimension of one mould-made part, in cm

# Table 5.

Dimensions of different "eaves tile" elements, in cm



Each mould-made element consists of five "eaves tiles". The mould for the type with rounded tiles (picture in table 5) included a row of beads. The type with pointed tiles interspersed with pinnacles, which was used on the terraces of the *yaowang pusa* wall, includes a band with small studs, but not the beads (fig. 49).

The dimensions of the different eaves tile elements are given in table 5. There are four kinds with rounded eaves tiles which are identical in design, but different in size. One was used for the frames of the west wall, the terraces around the 1000-armed *guanyin* (northern insertion wall) and the canopy of the *kongqueling wang*. The second was used on the terraces next to the *guanyin* and the *puxian pusa* on the middle wall. The third and fourth kinds were found on small terraces of the north gable wall next to the *dizang pusa*. The two types with pointed eave tiles were used on the *yaowang pusa* wall and the south gable wall. They are of different dimensions.

This shows that the same moulds were used on the west wall and the adjacent sides of the insertion walls (*kongqueling wang* and Thousand-armed *guanyin*). Besides the eaves tile elements this also applies to clouds, twine-friezes (table 4) and parts of figures. On the backside of the middle wall (*guanyin* and the *puxian pusa*) other types of moulds were used. The moulds used on the *yaowang pusa* wall partly reappear on the adjacent part of the south gable wall.

The comparison of mould-made parts can help to establish units of wall decoration which cannot be recognised easily on the base of stylistic criteria.

Fig. 52

*Yaowang pusa*, area 4. Cone-shaped end of rock column with dents made by pressing the fingertips into the soft clay.

#### Fig. 53

Thousand-armed *guanyin*: Surface of a modelled mountain with streaks and whirls made by fingers and decorations of dents by means of fingertips.





### Surface structures

As far as the surfaces are not decorated with mould-made elements, traces of modelling can be detected. Incised lines as folds of the robes, the waves, the lines in the elephant's saddle and the joints or the bricks in the house in area 2 were produced with modelling tools. The backgrounds mainly show traces of fingers, not of tools. The structures in the surfaces of the mountains, the dents in the mountain peaks and cone-shaped top-pieces are the marks of fingers, either leaving long streaks from pulling the fingers over the surface or rounded dents from pressing the fingertips into the soft clay surface (fig. 52, 53 and 57).

### **Glass** eyes

The big sculptures of yaowang pusa and kongqueling wang have glass eyes, consisting of black glass bulbs (fig. 54). The tiger and the peacock as their animals also had glass eyes, but the glass bulbs are missing today (fig. 55). The assistance figure PY 10.25 has no glass eyes although the sculpture is rather big (97 cm high, fig. 56). This may indicate its lower importance.



Fig. 54 kongqueling wang: Eyes made of black glass bulbs (detail of

Fig. 55

and peacock (right) with empty eye sockets after the loss of the glass eyes; imprint of stem of the glass bulb still visible

Assistance figure PY 10.25: painted eyes

# **PAINTING TECHNIQUE**

The examination of the painting technique did not belong to the aims of the work visit in 2010. Nevertheless, useful side observations could be obtained from the survey and mapping of the wall.

# **Priming layer**

Behind the severed right arm of PK 9.49 (*kongqueling wang* wall, tier 6, left side), traces of white are visible on the clay-straw undercoat below the fine clay layer. Identical traces were observed on the west wall. It can be assumed that a layout of the wall design or the arrangement of the sculptures was sketched on the undercoat layer before the figures and reliefs were made.

The priming layer is differentiated into a grey and a white ground. The grey priming layer was used for the mountain backgrounds on both sides of the wall. On the *yaowang pusa* side, the lakefronts of the fish ponds (fig. 57), the walls of the house in area 2, the roofs and the kneeling man in area 2 (PY 10.5) received a grey priming layer as well.

A white priming layer was used for sculptures and finely modelled parts. It can be found on all the figures and clouds of the *kongqueling wang* side. On the *yaowang pusa* side, most of the human figures and the animals have a white priming layer, as well as the parapets and the door wings, the backgrounds of the central pavilions and the water inside the fish ponds. The white was applied after the grey priming layer, as overlapping of white on grey proves. The white priming was applied at least twice. Traces of run-down material and splashes indicate that the white priming had a low viscosity (fig. 58).

The differentiation between white and grey priming layers probably should increase the threedimensional appearance of the reliefs. Furthermore, in the mountains the grey priming in many places served as a still visible ground colour. In less visible areas, such as the backgrounds of areas 5 and 6, there is almost no paint layer on top of the grey. Areas which are not visible for a visitor standing on the floor did not receive any priming layer at all, for example the top sides of the terraces (fig. 57).

On the right crook of the arm of the *kongqueling wang*, a strip of thin paper is imbedded into the white priming layer. It was probably meant to cover the shrinkage crack between the arm and the body.

# Lifen decorations

The technique of applying raised lines and dots to the priming layer, comparable to the Italian technique of *pastiglia*, is called *lifen* in Chinese. The lines form ornaments in areas which were supposed to be gilded (*lifen tiejin*). On the sculptures of the Shuilu hall, the lines are very fine. They were covered by another thin application of white priming before the gilding was applied. *Lifen*-ornaments were used as decoration of the clothes of the *kongqueling wang* and the *yaowang pusa* and on the lotus petals of the *kongqueling wang*.

The robes of both sculptures show broad borders decorated with *lifen*-flowers (peonies ?) along the edges. Stripes divide the robe into squares and thus probably indicate the seams of a *kashaya*. The skirt is decorated with a flower pattern at the upper border (fig. 63) and two lively dragons in clouds on the knees (fig. 60 and 61). On the *kongqueling wang*'s knees, the body of the dragon is covered with tiny dots, on the knees of the *yaowang pusa* with little

lines. The dragons are very similar in style: on the ones of the left knees the head is depicted in profile while those of the right knees are looking towards the observer, both sporting long eyelashes. Each petal of the lotus seat of the *kongqueling wang* is decorated with a flower (peony or lotus ?, fig. 62).

#### Fig. 57

Detail of the top side of area 1 of the *yaowang pusa* side. The rim of the fish pond has a grey priming layer, but underneath the green waves the priming layer is white. The parapet also received a white priming layer. The top side itself was not painted at all, splashes of the priming materials remained visible.

### Fig. 58

Yaowang pusa, detail of wall inside the central pavilion of area 4. Two applications of white priming material are visible, both applied rather liquid. The lower part was covered by two small sitting figures which are lost today. Where they were attached to the wall, the coarse clay layer (undercoat) containing straw is exposed.







### Fig. 59

*Yaowang pusa*, area 2. Detail of the house. At the wall and the roof, the grey priming layer was used as grey colour of bricks.



Fig. 60

Dragon pattern in lifen-technique on the knees of the kongqueling wang





### Fig. 61

Dragon pattern in lifen-technique on the knees of the yaowang pusa



### Fig. 62

Flower pattern in *lifen*-technique on the lotus petals of the *kongqueling wang* 



Fig. 63 Flower pattern in *lifen*-technique on the upper hem (waistband) of the skirt of the *yaowang pusa* 



Fig. 64 Small rectangular gold leaf of 20 x 20 mm on ridge of roof (*yaowang pusa*, area 3)

# Gilded parts

Gold was applied to the skin and the robes of the big sculptures which thus are completely golden except for details like lips, eyes, moustache, the red lining of the *kashaya*, the jewels in the hair of the *kongqueling wang* and elements in the gilded crown of the *yaowang pusa*. The *yaowang pusa* has grey or black hair, and the *kongqueling wang* probably had golden hair. On the smaller sculptures and reliefs, borders of robes and parts of the architecture were gilded, such as the decoration of the roof ridge and hip, eaves tiles, part of the corbel brackets and the pillar capitals; the lower panels, the bead band and the pinnacles of the parapets. The big dragon next to area 2 has a golden skin.

For the skin of the *kongqueling wang* and the *yaowang pusa* powder gold was applied to a dark pink ground. On robes, architecture and the golden dragon leaf gilding was used. The gold leaves were applied to a transparent brownish layer over a bright pink ground. Small rectangular leaves of 20 x 20 mm or smaller are visible on the roof ridges (fig. 64). On the small sculptures, the gold was applied after the coloured layers had been finished.

# **Pigment layers**

The *yaowang pusa* side is dominated by the colours green, white and red, highlighted by gold. The grey priming layer remained visible in many parts and served as grey colour (fig. 59). Pink occurs in larger scale only in the rock columns (fig. 52). Black is used in sketchy manner to emphasize the structure of the mountains and to add small details like leave patterns (fig. 68). The skin of all sculptures is white. The eyes, the hair, the moustache and the brows are painted in black. The doctors have red lips. Among the small sculptures, red lips could only be detected on PY10.9 (man in the door of area 3), but they may be lost on the other figures. The waves of the fish ponds are painted in different shades of green on grey underpainting and highlighted with white. One of the doctors has a dark purple robe (PY10.16), two of them have a black one (PY 10.19 and PY10.23). No blue or yellow areas were found.

On the *kongqueling wang* side green, red and white are used, highlighted with gold, and in minor scale grey and pink. Blue, yellow or brown (sparsely used on the west wall) could not be detected. There are losses of paint layers and discolorations by soot, so it is not clear what the original colour of the robes and clouds now appearing light grey had been.

In the mountains two to three different shades of green were applied on top of the grey priming layer, the darker shades as an accent on the lighter green. Black is used for dark shades and contour lines. No pink was used. Tiny trees are painted in black on the grey background (fig. 66). The execution of the details is less fine than on the *yaowang pusa* side.

The robes of the medium-sized and small sculptures are red, green (with and without grey underpainting), and white (not painted), with some dark or light grey and black parts. One robe is reddish brown. Borders, hats and some attributes are gilded with gold leaf. The flesh tones are mostly white, eight figures have dark brown skins, two have a green skin (PK 9.19 and PK 9.24). Eyes, moustache, brows and hair are painted black. The lips are red, except for the small sculptures where no colour is visible on the mouths.

The clouds are green (on grey underpainting), pink, and orange-red. A few of them appear light grey or white (for example two clouds in the ledge below tier 6, left side). It is not clear if the paint layer is lost here. The raised edges are highlighted in white, now discoloured to a greyish yellow.

The peacock originally was white with a red beak and red legs. The tail feathers below the lotus seat are green. The feathers of the fan (feather nimbus) are brownish purple with green brushed drily on the raised parts around the eye. The quill and the loop around the eye were highlighted with gold leaf, the eye itself was glazed (?), probably after being gilded (fig. 65).



Fig. 65 Kongqueling wang, peacock feathers



Fig. 66

*Kongqueling wang*, tiers 4 and 5, right side: painted mountains and trees, sculptures dominated by green, red, white and gold

Fig. 68 Rock pillar left of the head of the *yaowang pusa*: details in black and black shading



# Fig. 67

Kongqueling wang, mountains right side: different shades of green and black contours



# **PREVIOUS REPAIRS**

### Introductory remarks – "renovation in 1981-85"

The examination revealed that different kinds of repairs had been carried out on the sculptures, the reliefs and the wall: missing parts of wall plaster had been closed and losses in the reliefs completed; replaced clouds, parapet elements and peacock feathers were found as well as remodelled figures and reliefs. The repairs had been made with different materials (clay, clay with straw, clay with lime, partly also lime and concrete on the daises), and they differ considerably in style and quality. Nevertheless, in principle they could all date from the same time: a chronology of different materials overlapping each other could not be established. The differences might be explained by different work teams and an unsystematic use of materials.

According to FAN Juan 1994, the last comprehensive renovation took place from 1981 to 1985.<sup>6</sup> The photographs in the booklet of FAN / ZHANG 1983 show the sculptures and reliefs with the completions and the fired bricks assigned to this renovation phase. Only the damage in the belly of the *guanyin* and the broken trunk of the *puxian pusa* had not yet been repaired. The repairs on these two sculptures are assigned to the years 1988 or 1990-1991.<sup>7</sup> On the other hand, the photograph of the *kongqueling wang* in FAN / ZHANG 1983 (see: *Current situation of damage*, fig. 93) shows a detached feather lying on the left side of the lotus seat. This indicates that the renovation of the sculpture either had not been finished – or had not been started yet. The photograph on the cover of the booklet shows that the wooden beams next to the middle wall had not yet been painted, either because they had been exchanged or stripped of paint. This, too, indicates that both pictures were taken before the renovation was finished.

The photographs in FAN/ZHANG 1983 lead to the conclusion that the completions of missing elements and repairs on the reliefs – and thus most of the interventions – had either been finished already in 1983 or that they date from an earlier, yet unknown intervention. Because of lack of further information, the term "renovation in 1981-85" is used in this text to describe all the treatments assigned to this period.

Completions of the sculptures and reliefs made in 1981-85 can be recognised by the fact that they are not painted. Clouds, parapet elements and peacock feathers were produced in moulds. Some are exact replicas of the original elements, but slightly flatter and broader in the details. Maybe an original element was used as master copy. Others differ in shape and design and obviously are creations by the craftsmen. The completions of the sculptural decoration are partly modelled roughly and rather shapeless, such as the mountains on the *yaowang pusa* side, and partly structured finely, such as the ones over the head of the *dizang pusa*. Lost parts of the sculptures were only replaced if this was necessary for the stability. Only the repairs on the wall edges and on the topsides of the daises were painted: repairs on the wall edges were covered with a white-wash. The daises were painted grey, matching the colour of the (newly built) brick revetments of their fronts. The quality and sensibility of the replacements are

<sup>&</sup>lt;sup>6</sup> FAN Juan 1994, p. 112, Table 1: Chronology of restoration projects in the Shuilu hall.

<sup>&</sup>lt;sup>7</sup> FAN Juan 1994, p. 112, Table 1, Chronology, mentions that according to the report by Fan Weiyue more than 30 sculptures were repaired, one after the other, from 1988 to 1991. On p. 18, it is stated that the sculptor Zhao Shi repaired more than 30 damaged areas on the sculptures in 1990-1991, but that their exact position is unknown; and that the restorer Li Chengji reconstructed the elephant trunk of the *puxian pusa* in 1988. - In 2007, Zhao Liang showed several places where his father, Zhao Shi, is said to have repaired sculptures in the late 1980's, including the adjustment and mounting of a head for the figure interpreted as Maya (the original head was stolen) and the lost arm and weapon of a *jingang* of the north gable wall. Different from FAN Juan 1994, p. 18, Zhao Liang says that his father also repaired the elephant trunk, but not the damaged belly of the *guanyin*.

mostly insufficient, but they were based on a theoretical approach which is astonishingly differentiated and modern, i.e. the decision to restrict completions to stabilising parts and to those which can be reconstructed without doubt (mould-made parts), and to leave the completed parts recognisable.

# Wall construction

The repairs on the construction parts concern the upper zones of the wall and the connection of the insertion wall with the south wall and column SIWN. The following interventions could be detected:

- Above the southern insertion wall, the panel between the lintel and the purlin was removed. There is no indication of the reason for this intervention.
- The top of the southern gable wall next to the insertion wall was repaired using grey fired bricks (probably in 1981-85) at the place where the poles of the mountain scenery and the purlin enter the south wall. It is not clear if the poles rest on the fired bricks or if the bricks just fill the space below them.
- Band irons were added between wooden elements to prevent further movement and opening of joints: There ia a band iron around the column SIWN connecting it to the beam towards the west wall. A straight band iron connects the purlin with the beam to the east. An insertion of "iron rings" with screws is mentioned in FAN Juan 1994 as an intervention from 1959.<sup>8</sup>
- The vertical gaps between the southern insertion wall and column SIWN and between the southern end of the insertion wall and the south (gable) wall were closed with plaster. The clay plaster fillings inserted at the connection with the south wall look as if they could be assigned to 1981-85. At the connection with column SIWN, a lime-containing plaster was used. The plaster fillings and the area around the rock pedestal of the peacock were painted with a white-wash.

# Kongqueling wang wall

# Background, mountains and canopy

The mountain scenery in the upper part was repaired in 1981-85:

- One mountain peak on the right side was remodelled (second peak from the south, fig. 69, white arrow). Originally there had probably been a sculpture on that mountain peak like on all the others. If it had, it had presumably been missing in 1981, for there is no sign of a sculpture having been attached to the repaired mountain. The peak right to it and next to the south wall (fig. 69, red arrow) was repaired.
- On the left side of the upper part, a "flower-shaped" element together with the mound it is standing on was re-attached to the pole below using clay suspension (fig. 70, white arrow). The connection was not stable, so the element was found detached in 2010.
- Next to column SIWN, parts of the mountains were remodelled, probably closing a gap between the wall and the column. The same was done at the connection to the south wall between the second and the sixth tiers.

<sup>&</sup>lt;sup>8</sup> FAN Juan 1994, p. 16.

- The mountain at the south end of tier 1 next to the south wall was remodelled. The mountain next to tier 3 was remodelled or completed. A wooden peg indicates that a sculpture was reattached to the repaired rock. The sculpture is missing today.
- The fragments of the mountains found together with the canopy (see below: *Fragments of the upper part*) show completions from 1981-85. This proves that the area around the canopy was repaired during that intervention. The canopy itself does not show signs of repair measures.
- Different from the mountain area on the *yaowang pusa* side, no additional beam or support structures were inserted and no wire supports were used. This indicates that the canopy appeared stable at that time. Nowadays, however, the pole has sagged (at least 2 cm in the centre of the wall). It is unclear whether the sagging was already noticeable in 1985.
- On the left (northern) part of the wall, small holes in the background between the sculptures PK9.41 and PK9.42 (two holes), and between PK9.42 and PK9.43 (one hole) give evidence of an injection treatment, probably for stabilising the area which shows cracks and voids behind the plaster. It is not known when this locally limited injection treatment was done.

# Clouds

In the upper part of the mountains, three replaced clouds were attached in 1981-85. Two of them (below the remodelled peak on the right side and below PK9.9, see fig. 69) were made with a mould of the same design as the original clouds. The third cloud has a design not fitting to the *kongqueling wang* wall (fig. 70, lower part). The white half of a double cloud above PK9.9 (fig. 69) had originally been situated below the missing sculpture next to PK9.32 (tier 3, south end) where the other half of the cloud is preserved. The green half of a double cloud below PK9.6 (fig. 69) too may have come from another position, for it is the wrong type for the mountain scenery.

# Sculpture of the kongqueling wang

Large parts of the feather fan nimbus were completed in 1981-85. The replacement feathers were made by moulds. The rows next to the *kongqueling wang* are completely new. The replaced feathers are discernible on the photograph in FAN / ZHANG 1983 and thus must have been executed before 1983.

The gap between the *kongqueling wang* and the wall was closed. Replaced feathers were applied to the filling. The filling partly overlaps the original wall surface which shows remnants of paint and marks of the lost feathers. It also overlaps the back of the *kongqueling wang*, covering the original modelling and gilded surface of the robe (fig. 75 and 77). The crack around the lotus seat was filled (fig. 76).

Four iron rods were inserted into the sculpture of the *kongqueling wang*, obviously to stabilise the sculpture and increase its adhesion to the wall:

- Proceeding from the *kongqueling wang* side, two holes were drilled from the top of the lotus seat downwards in an oblique angle into the wall. The ends of the rods are discernible in cavities of the seat (fig. 71). Probably there are nuts on the end of the rods. The iron rods re-appear on the bottom side of the lotus seat (fig. 72 and 73). It is not clear how far they reach into the wall. The damaged places in the lotus seat and the peacock tail feathers underneath the seat were closed with clay fillings in a rather coarse way.



#### Fig. 69 Kongaue

*Kongqueling wang*, upper part, right side: Remodelled mountain peak (white arrow), repaired peak (red arrow); repaired connection with the south wall and fired bricks at the top of the south wall

### Fig. 70

*Kongqueling wang*, upper part, left side: Flower-shaped element which had been re-attached in 1981-85 and was found detached in 2010 (white arrow).

#### Fig. 71

View at the top of the lotus seat with holes of the iron rods

#### Fig. 72

Iron rod on north side, visible part between lotus seat and peacock/wall

### Fig. 73

Iron rod on south side, visible part between lotus seat and peacock/wall



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area 3 - southern rod



area 4 - northern rod Fig. 74 End of iron rods on the yaowang pusa side

Fig. 75 *Kongqueling wang*, southern side with fillings from 1981-85; cracked plaster mark





Fig. 76 Kongqueling wang, northern side, iron rod concealed behind cloud (white arrow)

Fig. 77

*Kongqueling wang*, after removal of partial fillings; iron rod at elbow (white arrow)



- The other two iron rods were inserted into holes drilled through from the *yaowang pusa* side. The ends of the rods are visible in areas 3 and 4 next to the rock columns of the *yaowang pusa* niche (fig. 74). The rod in area 3 has a plate and a nut, the one in area 4 has no locking. In area 4 an additional drill hole is visible, obviously a discarded first attempt. The iron rod in area 4 runs almost vertically; the one in area 3 is sloping toward the *kongqueling wang* side. The iron rods reappear in the gap between the *kongqueling wang* and the wall, at the level of his elbows. The one on his right side is hidden behind a small cloud made in 1981-85 (fig. 76). The other one was covered with the clay plaster between his shoulders and the wall (fig. 75 and 77). Both iron rods end inside the *kongqueling wang* and are not visible from the front.

Across the crack between the *kongqueling wang* or the lotus seat and the wall, three small plaster marks were applied for monitoring the development of the cracks:

- southern side: across the crack below the wing (see: *Current situation of damage*, fig. 8) - northern side: below the left elbow of the *kongqueling wang* (see fig. 75, centre), and across the crack in the tip of the wing (see: *Current situation of damage*, fig. 88). The time of their application is unknown. All plaster marks had cracked in 2010.

### Yaowang pusa wall

Repairs were mainly executed on the topmost part of the mountain relief and on the dais. There are only few repairs on the sculptures and reliefs.

### Mountains and backgrounds

An additional beam of about 18 to 20 cm in diameter was inserted behind the mountain peaks to disburden the sagged pole inside the mountain relief.

The rock columns were attached to the new beam with wires (fig. 79 and 80). The wires were inserted through holes drilled through the rock columns. A few rock columns were additionaly fixed with strings of plant fibres, probably hemp (fig. 78). The rock columns were remodelled using a clay-straw plaster (fig. 79). Mainly the clay straw is applied over the original bundles of reed. Two or three new bundles of straw or reed were inserted between the original ones in the central part of the wall, just above the crown of the *yaowang pusa*. The clay modelling is rough and rather shapeless. The clay contains coarse parts of straw with a high amount of infructescences, proving that wheat straw was used.

Over the big crack between the southern insertion wall and the south gable wall, a plaster mark was applied next to area 3. It has cracked. It is not known when it was applied.

#### Fig. 78

Rock column fastened with wire (red arrow) and hemp strings (yellow arrows). Around the rock column the completions from 1981-85 are visible (not painted parts)





Fig. 79 Mountains of the *yaowang pusa*: behind the peaks a beam was inserted in 1981-85 (white arrow)



Fig. 80 Beam from 1981-85 and wire fixation of rocks

# Back of niche of the yaowang pusa

The wall surface inside the niche of the *yaowang pusa* was repaired by applying a layer of clay-straw plaster. The remnants of the head and body nimbus were covered with the new plaster.

# Sculpture of the yaowang pusa

The decorated crown was fastened with thin wires which were wrapped around the hair knot (either in 1981-85 or later). The thumb and the middle finger of the left hand were re-attached and re-modelled with clay plaster. According to FAN Juan 1994, p. 18, Zhao Shi, the father of Zhao Liang, repaired the hand in 1990-91, but the material and the clumsy execution lead to the assumption that the repair was done in 1981-85. The two fingers are rather shapeless and are broken off again.

# Smaller sculptures

One doctor in area 5 (PY 10.19, first one from right) had been broken off. The part between his knees and feet was remodelled. The roughly executed remodelling is too short. The position of the figure is wrong; the original angle of inclination was not considered (fig. 81).



Fig. 81 Area 5: "Doctor" PY 10.19 (arrow) with completion by part between legs and knees

# Dais

The dais received a brick revetment of the front and a new plaster on the top surface, both probably executed in 1981-85. There is no evidence how the dais looked before the repair, neither in material nor in shape or design of the front and the top.

- Fired bricks with the dimension of 24 x 11.5 x 5.5 cm were used for the revetment. The front of the brick revetment is 82.4 to 82.7 cm high. The revetment shows abrasion in the lower part caused by the feet of visitors. Seen from the top, the dais is not symmetrical and has no right angles. Next to the *jingang* of the south gable wall there is no brick revetment; the front is only covered with plaster and white-washed.
- The top of the dais was covered with a lime-plaster and white-washed. Underneath the limeplaster, there is a clay plaster with traces of white paint. The current surface is 3 to 10 mm higher than the older one and thus overlaps the feet of the assistance figures slightly.
- The assistance figure on the north side (PY 10.25) had been loose at the time when the surface of the dais was renewed. The figure was stabilised in a slightly shifted position (towards the north side and towards the front). The difference is about 4 cm. In addition, the figure was affixed with a wire around the waist. The wire was attached to a nail in the rock column near the column. This emergency measure was carried out after 1981-85.

# CURRENT SITUATION OF DAMAGE

Damage to the southern insertion wall can be divided into three groups:

I. Structural problems: This category comprises cases of damage endangering the stability of the wall and its main parts. In detail this means damage to the wall and the connection of the larger parts of the sculptural decoration to the wall. This damage can be classified into four subdivisions:

- damage to the post construction
- damage to the clay wall
- damage to the interconnection between the kongqueling wang and the wall
- damage to the mountain areas projecting above the top of the clay wall

II. Damage to the wall decoration: This group comprises more superficial damage to the wall plasters, the sculptures and reliefs:

- detached plasters and voids below the plasters
- broken and loose parts
- losses
- damage to surfaces and paint layers

III. Situation of the surfaces: The main problem is the extreme accumulation of dust. Another aspect is a large number of detached fragments "stored" on and next to the wall.

Though there are severe occurrences of damage, both sides of the wall are still well-preserved in the main parts. The cases of damage in categories I and II were recorded in detail in mappings. Findings of detached fragments are listed in: *List of findings 2007-2010*, p. 165-178.

# I. Structural problems

# Damage to the wooden post construction

The wooden post construction is built as a "frame" of uprights connected to each other with lintels and beams which are mortised into the uprights to stabilise the structure. Beams and purlins resting on top of the uprights are not connected to the "frame" or to each other with timber joints, what means that they can slightly move. This results in a certain amount of flexibility between the roof truss and the uprights which increases the stability of the construction in situations of strong stress (for example earthquakes).

The wooden construction next to the southern insertion wall experienced slight deformations in the course of time. The most serious damage probably is the sag of the wooden uprights inside the west wall due to the strong deterioration of the wood. In consequence, all the beams spanning the rear part of the hall in east-west direction nowadays are tilting towards the west wall.



#### Fig. 82

Vertical section, view from the centre towards the northern end

### Fig. 85

View at column SIWN with attached beams during the work in September 2010. White arrows: Band iron straps attached with screws in 1981-85.





Fig. 83

View at the inner side of the southern insertion wall from the centre towards the northern end showing the shifted corbel element

(white tube: insulating of electric cables for emergency lights and security systems)

#### Fig. 84

View at the wall crest on the *yaowang pusa* side with broken adobe bricks



The corbel element above column SIWN, below the purlin, has shifted laterally towards west (about at least 10 cm), and it has also tilted slightly under the weight of the purlin (fig. 82: C; fig. 83). The movement was possible after the stabilising panel between corbel and lintel (fig. 82: P) was lost.<sup>9</sup>

Column SIWN has tilted towards west (6 cm) and south (1.8 cm). The tilt towards west is connected with the slope of the beams resting on top of it. The shift towards south can mean that the column inside the southern wall, too, is not perfectly stable anymore.

During the renovation in 1981-85, iron band straps were inserted to stabilise the connection between column SIWN and the beams. This means that nowadays there is a stationary connection between the purlin and the beams towards east (fig. 85, arrow 1). The angle of the connection between column SIWN and the beam to the west is also fixed now (fig. 85, arrow 2). A further sagging of the columns inside the west wall thus would increase the tilt of the column towards west.

In the renovation work during 1981-85, the components of the wooden construction were checked and obviously replaced partly. On few parts where the red paint is missing, decay of the wood is visible, especially at the base of the wooden upright next to the southern insertion wall and the beam connecting it to the west wall. The stability of the damaged parts and the type of decay were not examined in September 2010.

# Damage to the clay wall

There is no evidence that the clay wall has suffered from the distortion of the wooden post construction surrounding it. There is an open joint between the southern insertion wall and the south wall, today partly concealed below fillings made in 1981-85. The opening of the connections between column SIWN and the insertion wall may be caused by the movement of the column, but cracks along adjoined walls or parts of architecture are normal in wooden constructions with earthen walls.

While the original wall crest seems to be preserved on the side of the *kongqueling wang*, the topmost layer of adobe bricks on the *yaowang pusa* side is damaged. Broken adobe bricks are lying loosely on the northern part of the wall (fig. 84).

On the *kongqueling wang* side, the absence of a wall was used to design the mountains as open-work: The openings are situated in the zone between the wall crest and the support pole of the mountains. There are similar openings on the *yaowang pusa* side, but only in the repaired parts, not in the preserved original ones. So far, it was not possible to find out how high the original wall was on the *yaowang pusa* side or how much is missing there.

The thickness of the wall measures 32-35 cm on the wall crest, but at the level of the neck of the big sculptures the wall is only about 30 cm thick. There are two possible explanations for this phenomenon: The top layers of adobe bricks may have broadened under pressure of the lintel, or the reduction in thickness is caused by the loss of substance in the lower part. A loss of the original surfaces of the adobe bricks can be observed on the *kongqueling wang* side in the area of the nimbus. On the *yaowang pusa* side, the original wall behind the head of the sculpture is concealed behind a clay-straw plaster dating from 1981-85. It is possible that the wall had been damaged or weathered off before the repair plaster was applied to it.

<sup>&</sup>lt;sup>9</sup> It is not clear since when or why the panel is missing.





Fig. 86 Southern insertion wall, view from south with section of the cavity behind the *kongqueling wang* 

The wall is overhanging on the *kongqueling wang* side, the top of the wall projecting compared to the foot of the wall. The difference between tiers 1 and 6 was measured between 0 cm on the northern end and 7 cm on the southern end, in average about 3 cm. The difference between the wall crest and the bottom of the wall can be estimated to amount to at least 7 cm. The reason for this inclination is not completely clear, but can be connected with the tilt of the *kongqueling wang* (see below).

### Connection between the kongqueling wang and the wall

The joint between the sculpture of the *kongqueling wang* and the wall has opened. In 1981-85, the gap had been closed with a thick layer of clay-plaster. New feathers had been applied on top of it. The plaster covers the back of the arms and shoulders of the *kongqueling wang*. In September 2010, the filling below his left elbow (i.e. the side towards the south wall) was removed in order to investigate the wall situation (fig. 75, 77 and 90). The feasibility of doing the investigation was limited because the filling should not be removed completely and there were no additional devices, like glass fibre-optic light guide or an endoscope to explore the cavity behind the sculpture.

The investigation proved that the sculpture has got completely detached from the wall. Figure 86 shows a sketch of the situation: At the neck, the gap between the figure and the wall amounts up to 6 cm, at the elbow up to about 4 cm, at the lotus seat up to 2.5 to 3 cm on the southern side (fig. 89) and up to 1 cm on the northern side fig. 88). At the level of the lotus seat, the plaster had been pulled forward until it broke: Cracks starting from the edge of the lotus seat continue on both sides, through the wing tip (southern side, fig. 91) or above it (northern side, fig. 87). The misalignment of the fracture edges amounts to 1 cm at the southern side and 1.5 cm at the northern side. The top of the lotus seat is sloping from the wall to the front; the difference measures about 4 cm on the northern side, and 0.6 cm on the southern side. At the bottom side of the lotus seat, there is a crack, but it is not gaping. A crack is also running around the body of the peacock. At the level of the lotus seat, the plaster has disconnected from the wall in the full width of the wall. Below the wings and next to the feet of the peacock, there are big voids behind the plaster as well.

The observations prove that the sculpture together with the lotus seat is tilting forward, imposing pressure on the peacock which is still connected to the wall and not tilting. The degree of inclination is slightly bigger on the northern side (the right side of the *kongqueling wang*) than on the southern. Due to this force, the plaster around the sculpture has got deformed and became detached from the wall, resulting in the deformations and the crack through the wing tips at the level of the lotus seat.

Behind the *kongqueling wang* there is a deep cavity (fig. 86). It can be assumed that it was made intentionally: By inserting the rough modelling of the back of the sculpture into the cavity, the adhesion between the sculpture and the wall was increased, and the centre of gravity of the figure was shifted close to the wall surface.

It was not possible to measure the width of the gap between the clay core and the wall, but it can be estimated to be more than 4 cm as it was easy to fit a hand inside. At the level of the lotus seat, the cavity of the wall is at least 22.5 cm deep. The big peg of the sculpture is running across this big cavity, disappearing between debris of earthen material. It was not possible to detect how deep the tip of the peg is reaching into the solid wall. As the thickness of the wall can be estimated to measure 30 to 33 cm, the preserved part of the wall is only 7 to 10 cm thick.

The structures inside the *yaowang pusa* and the rock pedestal as well as their connection to the wall are unknown. It is possible that the peg from the lotus seat of the *kongqueling wang* 

reaches through the wall into the body of the *yaowang pusa*. In this case, the *yaowang pusa* and its pedestal would serve as a support for the wall and the *kongqueling wang*.

The weight of the *kongqueling wang* and the lotus seat was tentatively calculated, based on the weight of a sculpture from the west wall (table 6). The weight of the sculpture and the lotus seat can be estimated at 280 to 360 kg (corresponding to a specific weight of 1.0 to 1.3). The weight of the clay wall (365 x 315 x 30-35 cm) is about 5180 to 6036 kg (based on the specific weight of adobe bricks from Shuilu'an of 1.5).

The iron rods were inserted during the renovation in 1981-85 in order to stabilise the sculpture which apparently seemed to be unstable. It is necessary to evaluate if the four iron rods provide a sufficient stabilisation for the future. The cracks running through the old gypsum marks prove that there is still movement along the cracks. Unfortunately it is not recorded anywhere when the gypsum marks were applied and when they cracked. As control measurements are missing, it also is not clear whether the cracks through the gypsum marks happened on all the joints of the clay parts as a normal and unperilous consequence of fluctuations of the humidity.





▲ Fig. 87 Crack and shifted level of wall surface between lotus seat and wing tip, northern side

# ◀ Fig. 88

Crack between lotus seat and wall and around the body of the peacock, northern side Traces of gypsum mark across the crack.





▲ Fig. 89 Open joint between lotus seat and wall

➡ Fig. 90 Southern side of the *kongqueling wang* 

▼ Fig. 91 Crack proceeding from the lotus seat through the tip of the wing



Table 6.

Estimation of the weight of the *kongqueling wang* including lotus seat, based on the calculations of the volume and the weight of a sculpture from the west wall

### Calculation of the weight of the kongqueling wang

Parts of the sculpture estimated as blocks:

Parts	H(cm)	W(cm)	$D(\mathrm{cm})$	$H x W x D (cm^3)$
head	32	24	18 (?)	13824
upper body	36	57	22	45144
lower part of body	48	27	25	32400
legs	79	20	48	75840
hands, estimated				3500
lotus seat	100	18	62	111600
kongqueling wang total				282308
pearl below lotus seat	20	13	20	5200
body of bird	46	23	33	34914
wing of bird	55	6.5	6.5	x 2 = 4647.5
leg of bird	65	8	26	x 2 = 27040
head of bird	25	10	9	2880
neck of bird	32	7		2450
<i>kongqueling wang</i> and peacock total				359439.5



>> For further calculation, the volume of the *kongqueling wang* was estimated to be **283 000 cm<sup>3</sup>**, that of the sculpture and the peacock **360 000 cm<sup>3</sup>**.

The calculation of the weight of a clay sculpture is based on the measurement of sculpture W1.46 from the west wall:

Dimensions max.: 50 x 17 x 13 cm

Weight: 6.25 kg

(For comparison: medium weight of clays (humid ?): 800-1200 kg/m<sup>3</sup>, rammed earth: 1800-2200kg/m<sup>3</sup>, fired bricks: 1560-2000kg/m<sup>3</sup>; specific weight of adobe bricks from Shuilu'an and Xi'an: ca. 1.5)

The volume of W1.46 was calculated without the head. There are several estimations for the reduction of the body into a cube:

H (cm)	<i>W</i> (cm)	D (cm)	$Hx Wx D (cm^3)$	<i>weight / cm</i> <sup>3</sup> (g) (specific weight)	weight of kol wang (kg) sculpture	ngqueling sculpture + peacock
40	17	13	8840	0.7070	200.08	254.52
40	15	11	6600	0.9469	267.97	340.88
40	13	10	5200	1.2019	340.14	432.68
40	12	10	4800	1.3020	368.47	468.72
40	10	10	4000	1.5626	442.22	562.54

If the weight of the inner structure and the density of the clay inside the *kongqueling wang* are similar to the small sculptures of the west wall, the weight can be estimated at **280 to 360 kg**.

## Damage in the mountain area projecting above the top of the clay wall

Both sides of the wall show considerable damage in the topmost area with modelled mountains. The cases of damage and losses on the *kongqueling wang* side are more serious than those on the *yaowang pusa* side. There are different causes which can influence the development of the damage:

- Problems of the original construction (strength of poles in comparison to the modelled reliefs)
- Leakage in the roof
- Damage to and changes of the post construction and the wall
- Insufficient stability of repairs

The rock columns at the top of both walls are modelled over rather thin poles and mainly are self-supporting structures. They are less stabilised and thus more endangered than the reliefs attached to the wall with the complete backside. The sagging of the poles resulted in pressure on the substructure of the rock columns. Furthermore, the mountains are the part of the wall closest to the roof: Water leaking through the roof reaches the mountains first. The increase of weight and the softening of the clay caused by absorption of water, increased the pressure on the poles and weakened the stability of the slim, highly protruding rock columns. Changes affecting the construction like the removal of the board or the loss of the top layer(s) of the adobe bricks may have added to the weakening of the mountain area by increasing the danger of movement of the wooden construction and reducing the contact zones between the mountains and the wall.

The poles inside the mountains on the *yaowang pusa* side have sagged considerably: the front pole over which the mountains were modelled has sagged about 20 cm in the centre of the wall, the additional pole behind about 6 to 7 cm.

On the *kongqueling wang* side, the pole inside the mountains appears almost straight and horizontal from the south to the centre of the wall, but raises in level about 8 cm towards the north end. It is possible that the pole was warped or bent from the beginning, but it may also have been deformed by the weight of the mountains, and maybe the canopy, in the central part. On the northern end, the original bearing of the poles is preserved: on the *kongqueling wang* side, the pole is supported by two iron pins; on the *yaowang pusa* side, the poles are resting on the upper beam in east-west direction. On the southern end, the original bearing seems to be lost: The poles of the *yaowang pusa* side were stabilised in a sagged position during a previous repair (probably in 1981-85), about 10 cm (front pole) or 5 cm (second pole) below their original level.

The sagging of the poles resulted in the compression of the substructure of reed bundles. This caused the clay modelling to break and shear off. On the *yaowang pusa* side, the central part of the rock columns (above the head of the *yaowang pusa*) has sagged. Some rock columns are broken and distorted. Large parts of the original modelling got lost. The bundles of reed underneath are mainly preserved. During the renovation in 1981-85, two or three new bundles of reed or straw were added, but more than half of the modelling was renewed.

On the *kongqueling wang* side, there are only few losses, but cracks are crisscrossing especially the left (northern) part of the mountains, obviously originating from the pole. Due to the compression, the mountain relief near the top of the wall got detached from the wall. Two mountain peaks were remodelled during the renovation in 1981-85. In the boxes containing the collapsed canopy (see below, *Fragments of the upper part*), 143 fragments of mountains were found. Larger parts of them had been remodelled in 1981-85. This proves that

the mountains in the centre of the *kongqueling wang* wall were more damaged than the side parts even before the canopy collapsed.

The completions from 1981-85 prevented the exposed bundles of reed in the damaged mountain areas to fall apart. On the other hand, the rather crudely executed remodelling of many large shrinkage cracks may not have increased the stability of the rock columns. The visual appearance is not satisfying because the shapeless completions do not evoke the impression of mountains. On the *yaowang pusa* side, the surfaces are rough-textured with many straw particles sticking out resulting in a strange "hairy" appearance (fig. 13).

Fig. 92

Shapeless and roughly modelled completions in the mountains made in 1981-85; above area 1 (left side) and above area 2 (right side).



### II. Damage to wall plasters, sculptures and reliefs

The following paragraphs describe the cases of damage to modelled surfaces that are not connected with the stability of the wall structure. This comprises damage to the wall plasters, breaks and losses on the sculptures and the condition of the paint layers.

### Detached plaster layers and voids below the plaster

### Kongqueling wang - surrounding of the peacock

The detachment of the plaster in the two lowest tiers (tiers 1 and 2) between the lotus seat and the lower end of the wall can at least partially be connected with the detachment of the *kongqueling wang* from the wall and the pressure on the peacock. The voids detected by knocking at the wall stretch over the entire width of the wall except for the margins on both sides.

### Plaster layers on the yaowang pusa side

On the *yaowang pusa* side, there are only relatively small areas of plaster in the process of detachment. The renewed plaster in the niche behind the head of the *yaowang pusa* is becoming detached from the background which seems to be separating into several layers. The nimbus around his head is lost and is only visible as a border of the plaster material and a crack in the new plaster in the area above his shoulders. On the right (northern) side, there are large voids in the background behind area 6 ("doctors") and the assistance figure PY10.25.

A long and open crack with slight misalignment of the fracture edges is stretching down at the connection with the south gable wall from the mountains to area 5 ("doctors") where it branches out in several smaller cracks behind the sculptures. All eight "doctors" have tilted forward. This may have happened because the pegs are too short, but it can be an evidence of a damage hidden inside the wall as well.

### Detached parts of reliefs

### Kongqueling wang - Upper part of the feather nimbus and lacuna of the canopy

The upper central part of the mountain area was damaged by the movements of the pole, the collapse of the canopy and the detachment and tilt of the *kongqueling wang*. The tilt of the sculpture induced the detachment of feather nimbus and resulted in the loss of most feathers next to the body of the *kongqueling wang*. The picture in FAN / ZHANG 1983 (fig. 93) proves that the losses occurred before 1983 and thus independently of the collapse of the canopy in 1990. Today the upper part of the nimbus is very loose, and the modelled background of the nimbus becomes detached from the adobe bricks. Many of the renewed feathers are loose. It is not clear if this indicates that the *kongqueling wang* is tilting further because meanwhile many of the completions got detached due to poor manufacture technique. In the area once covered up with the canopy, the adobe bricks are exposed. Their surface looks weathered and crumbling, but is solid.

The damage to the mountain scenery is caused by the sagging of the pole and the stress on the exposed fragile support structures, especially the hemp strings. Originally the hemp strings had been imbedded in the clay and were part of a stable system; nowadays large parts are hanging on the single strings which are worn down and tend to give way. In the centre of the wall, the damage probably was increased by the collapse of the canopy, as a result of which the plaster layers in the areas next to the canopy got detached.



Fig. 93 Kongqueling wang in 1983 [FAN / ZHANG 1983, mirror-inverted]



Fig. 94 Kongqueling wang in August 2010

Fig. 95 Kongqueling wang wall in 2001 [Scheder 2001]



Fig. 96 Kongqueling wang wall in August 2010



lady with infant (PK 9.8)

mountain peak

piaodai

"flowershaped" element

cloud whirl

### Fig. 97 Kongqueling wang wall: parts which fell down since 2001



97a PK9.8: fell down between 2001 and 2005





Mountain, remodelled in 1981-85 over original reed bundle, fell down after 2005

Cloud whirl, found detached in



97c Part of left *piaodai* (flying band): fell down in August 2010

Fig. 98

August 2010: fragmented *piaodai* hanging fragilely on the peg; pink arrow: position of spiral cloud taken down for safeguarding

Fig. 99

**◀** 97d

September 2010

Temporary fixation of *piaodai* with strings, September 2010





The detachment of the wall decoration from the surface of the adobe bricks extends downwards to the already fragmented upper curvature of the nimbus. The two cloud whirls next to it are detached, only their "stem" (lowest part) is still connected with the wall. On the northern side, the cloud spiral next to the loss had broken off, and had been wedged in between the peg of the *piaodai* and the stem of the cloud whirl. It had to be taken down for reasons of safeguarding in September 2010 (fig. 95 and 96: pink arrows; fig. 97d and 98). Between 2001 and 2005, the sculpture of a lady carrying an infant (PK 9.8) fell down from the mountain next to the big lacuna because the broken rock column could not support the weight anymore (fig. 95 and 96: white arrows; fig. 97a). Between 2005 and 2010, a remodelled rock column, hanging upside down on the pole already in 2001, fell down (fig 95 and 96: yellow arrows; fig. 97b). On August 11, 2010, some broken clay fragments were found on the floor in front of the kongqueling wang. They had fallen down after the last visit on July 27, 2010. The major part of the fragments proved to belong to the flying band (piaodai, fig. 97c, 98 and 99) which indeed had been much longer in 2001 (fig. 95 and 96: red arrows). Nobody seems to have noticed the fall of the *piaodai* or any reason for it. It may have been caused by the fall of the mountain peak. A "flower-shaped" element close to the lady which apparently had been in place and straight in 2001, was found loose and tilted in 2010 (fig. 95 and 96: green arrows).

The comparison of the situation of the *kongqueling wang* wall on the photographs from 1983 with that one in September 2010 shows that there are only marginal changes and increases of damage in this central part of the wall (fig. 93 and 94). The fact that three parts have fallen down since 2001 and another one had to be taken down for safeguarding in 2010, however, proves that the top area of the *kongqueling wang* wall is fragile, instable and endangered.

In 2010 only preliminary treatments could be done: The cloud whirl and the mountain were taken down and stored. The sculpture of the lady and the fragile *piaodai* were temporarily affixed with cotton strings to avoid further losses (fig. 99). The "flower-shaped" element could be re-attached with clay suspension, but needs additional support by a string. It is necessary to re-establish the connection between the upper part of the wall and the mountains, the clouds and the feather nimbus before the detached parts can be definitely re-attached to the wall. The very fragile remnants of the *piaodai* are especially endangered.



Fig. 100 Heads missing on the *kongqueling wang* side

Table 7. Overview of lost parts

# 1. Kongqueling wang wall

part	number	positions
complete sculptures	2	- second mountain peak from the right (south)
		- right end of tier 3 (next to PK 9.32)
	1	- tier 6, PK 9.48 (found detached in 2005)
heads (fig. 100)	24	- tier 6: PK 9.47-53 (7 of 8 heads)
		- tier 5: PK 9.41-46 (all 6 heads)
		- tier 4: PK 9.33-40 (all 8 heads)
		- tier 3: PK 9.26, PK 9.27 (2 of 8 heads)
		- PK 9.2, PK 9.8, mountains (2 heads)
hands	16	- tier 6: all, often including arms
	10	- tier 5: 5 of six pairs of hands
	8	- tier 4: 4 of 8 pairs of hands
	10	- tier 3: 5 of 7 pairs of hands
	6	- tier 2. 3 of 8 pairs of hands
	4	- tier 1: 2 of 8 pairs of hands
	4	- mountains: 4 of 22 hands
decorations on hats	numerous	
attributes in hands	numerous	
tails of clouds	4	
feathers of nimbus	numerous	- mainly upper and left (northern) parts of nimbus
canopy		- 166 fragments found and stored in 2010
glass eyes of peacock	2	
kongqueling wang	1	- middle finger right hand
	several	- curls of hair

### 2. Yaowang pusa wall

part	number	positions
complete sculptures	2	- fishes in area 2
	2 ?	- figure on the right door of area 3; figure in front of the door ?
	6?	- all sculptures in area 4
	1	- unknown element on the left side in area 1
heads	1	- PY 10.24
	2	- PY 10.21 and PY 10.23 (2 "doctors")
	3	- small sculptures in area 3: PY 10.7, 10.9 and 10.10
parts of figures	1	- arm of man in the tree in area 1
-	3	- hands or arms in area 3
	numerous	- whiskers and spikes of dragon next to area 4
	1	- right hand of elephant driver in area 2
small parts of architec-		- branch of tree in area 1
ture and background		- part of the roof in area 2
decoration		- edge of right roof wing in area 3
		- door wing of left door in area 3
		- eaves tiles behind roof of area 3
		- right pilaster and part of left pilaster of central pavilion in area 4
		- parts of decoration on roof of area 4
		- railing of base of rock pedestal (almost completely broken off)
attributes		- PY 10.25: edge of book
		- PY 10.24: edges of bundle
rock columns	?	element on rock column between area 2 and column missing
mountains	?	element on peak 1 missing (big peg preserved)
glass eyes of tiger	2	- both glass bulbs missing completely
yaowang pusa	5	- pendants on necklace
	2	- spiral shaped decoration of necklace
	9	- ends and some parts of the stole
## Losses

The missing parts are listed on table 7. Breaks often are the first step before an element gets lost. Losses can be traced back to several causes:

- Detachment or breaks caused by loss of adhesion to the wall: This mainly concerns the canopy and the peacock feather nimbus of the *kongqueling wang*, as well as parts of the mountains of the *yaowang pusa*. It may also apply to smaller elements with unfavourable distribution of weight and balance.

- Cracks and losses caused by combinations of material: The damage occurs especially to thinner elements or parts. Cracks at the neck of a sculpture result from the different coefficients of the expansion of clay and the wooden pole inside the sculpture. When the neck is separated, the head gets loose and can get lost (or stolen). A manifest example are the assistance figures of the *yaowang pusa*: While figure PY 10.25 has a big crack in the neck (fig. 101), the head of PY 10.24 is already missing. Some figures fell from the wall like the lady with an infant (PK 9.8) on the *kongqueling wang* side or the mule (box 15-1) next to area 3 on the *yaowang pusa* side.

- Losses and breaks caused by mechanical damage: Typical cases of mechanical damage are bent elements, breaks in protruding parts like hands, fingers or attributes, and the loss of small protruding elements like decorations on the hats. The reasons have mainly to be seen in human activities on or close to the walls like dusting the walls, ladders and repairs close to the wall.

- Obviously, losses in the lower areas are also connected with visitors of the hall: Small sculptures and loose heads were stolen, parapets broken off. The surfaces of sculptures and reliefs which can be reached over the protective railing are polished shiny from being touched. The disappearing of heads can (mainly) be attributed to the time before the protective railings were installed. On the *kongqueling wang* side, almost all heads are missing in the lower tiers 4 to 6, i. e. up to the height of 230 cm above the floor. In the third tier only the two heads are missing which are the closest to the walkway of the visitors (fig. 100).

Hands and arms are also missing in the upper parts, their loss being caused by other reasons. It has to be assumed that the glass eyes of the peacock and the tiger were broken and removed by a person although it is unclear why and when this happened. It is unknown, too, why the sculptures disappeared from the terraces on *the yaowang pusa* side. Maybe they became detached and fell down. It is noticeable that in area 4 all the sculptures are missing that can be reached by a person climbing on the dais.

Some parts missing today may reappear when all the detached parts are retrieved from the hall and checked. The work on the west wall showed that detached fragments were partly stored on places far away from their original position. The "pharmacy counter" (PY10.15) was standing in area 4, but it belongs into area 3. Not all the fragments found in 2010 could be assigned to their positions: Most of the elements found on the terraces of areas 3 and 4 do not seem to belong to the *yaowang pusa* wall at all. Nevertheless, most of the missing parts of the *kongqueling wang* and *yaowang pusa* walls have to be considered as lost.

Table 8. List of loose parts

# 1. Kongqueling wang wall

part	number	positions
complete sculptures	1	- PK 9.53, tianwang, tier 6
heads	5	- PK 9.5, PK 9.6 (mountains), - PK 9.10 (tier 1) - PK 9.18 (tier 2) - PK 9.54 (tier 6)
hands	3 pairs	- PK 10.15 (tier 1) - PK 9.25 (tier 2) - PK 9.32 (tier 3)
other details	1	<ul><li>elongated attribute of PK 9.11</li><li>part of armour skirt of PK 9.49</li></ul>
canopy		- preserved <i>piaodai</i> : peg is loose; adhesion of <i>piaodai</i> to peg is very fragile.
parts of background	2	- cloud whirls next to upper part of nimbus
feathers of nimbus	several	- feathers next to the sculpture, mainly from 1981-85: all feathers on the northern side, feathers on the upper part of the southern side and single ones at the lower part
kongqueling wang		

## 2. Yaowang pusa wall

part	number	positions
complete sculptures or elements	2 1 3 1	<ul> <li>assistance figures PY 10.24 and PY 10.25</li> <li>"well" in area 1</li> <li>men in area 3: PY 10.7, PY 10.9 and PY 10.10</li> <li>body of dragon next to area 2</li> </ul>
heads	1	- assistance figure PY 10.25 ?: gap at the neck
parts of figures		- not counted
small parts of architecture and background decoration	2	- hanging decoration underneath roof of main pavilion in area 4
yaowang pusa	1 6	- left thumb - all parts of the stole: completely loose and broken fragments loose

# Loose parts

Table 8 gives an overview of loose parts. These parts are still connected to the support or to other elements, but their adhesion is not stable. Mostly the inner core is still holding the element together, but the clay modelling is broken. Loose parts and breaks often are the first step towards a complete detachment.

The two assistance figures PY 10.24 and PY 10.25 are loose and standing instable, because nowadays the pegs protruding from the sole of their feet are surrounded by powdered clay instead of solid material (originally probably adobe bricks, fig. 102).

The smaller sculptures get loose when the peg inside the wall is losing its hold. In the areas 1 to 4 of the *yaowang pusa* wall, elements attached by piercing the bamboo stick into the terraces got loose, because the inner core of the terraces only consists of reed.

Thin, elongated elements modelled over a wire core, like the flying bands and the stole, tend to break, at first across the clay coat and in a second step also along the wire. The element or its fragments get very fragile by this. If parts break off, they often get lost. The "bands" of the stole of the *yaowang pusa* are all loose today, broken many times, and parts of the clay layer are already missing.

The renewed plaster layers and remodelled parts from 1981-85 often are instable, and parts which were re-attached at that time get detached again. This is caused by the large shrinkage cracks which opened during the drying process (often several mm wide, fig. 103). Poor adhesion and large cracks can be observed on all repaired parts.



Fig. 102 PY 10.25, after removal of clay powder underneath the feet



Fig. 101 Detail of crack at the neck (ca. 1 cm wide)



Fig. 103

Left hand of *yaowang pusa*, repaired in 1981-85 Thumb broken again, shrinkage cracks

## Damage to the paint layers

The damage to the paint layers can be divided into two categories:

1. Damage caused by the loss of cohesion of the layers (powdery paint layers, flaking, losses) and abrasive influences (water penetration, cleaning, scratches)

2. Damage caused by materials deposited on the surfaces (soot, maybe discoloured coatings; polish; traces of former work)

## Detached and reduced paint layers

Powdering and flaking are probably caused by climatic changes. The damage was dramatically increased by the penetration of water through the leaking roof. In some areas traces of water running down over the surfaces are visible (fig. 107, blue arrow).

Applications of gold leaf show scaling and flaking often resulting in losses. This is visible on both sides of the southern insertion wall to the same extent. The fact that gold leaf applications tend to flake off while pigment layers tend to get powdery is probably related to differences in the binding medium. Repeated dusting resulted in losses of the leaf-gilding especially in areas facing upwards or protruding to the front. Probably protruding areas are also more affected by climate changes or, in former times, incense vapours (fig. 104 and 105).

Fig. 104

Losses in leaf-gilded areas by flaking (PK 9.15)



Fig. 105

Losses of leaf-gilding increased on protruding parts and top sides (PK 9.40)





Fig. 106 Petal on lotus seat next to the wall





Lotus petals on the front of the lotus seat: Paint layers blackened by soot. Blue arrow: trace of water running down

Fig. 108 *Lishi* PK 9.48: Skin polished and darkened by continual touching



Fig. 109 Area 2, PY 10.4, man with fish on a stick. Face, hands and fish, originally white, are now discoloured to a brownish tone.



Fig. 110 Discoloured white highlights on the clouds (behind PK 9.37)



In general, protruding and thus more exposed parts and the top sides are more severely damaged and show more losses of paint layers. Dust is accumulating above all on the top sides, and probably they were cleaned more often. Protruding parts like fold ridges, the edges of the lotus seat or the wings of the peacock are endangered by frequent touching and thus abrasion. The top sides were also more exposed to water dripping through the roof.

The powder gold of the skin of the big sculptures is reduced. On many protruding parts, the paint layer is completely abraded. Scratches and reduced thickness of the pigment layers also seem to be related to wiping or brushing in an attempt to clean the surfaces. Scratches can also be related to lack of care during working close to the walls.

On the *kongqueling wang* side, the medium-sized sculptures in the tiers on the left (northern) side show more damage and losses than on the right (southern) side. On the right side, the paint layers of the twine-frieze ledge and the cloud band above it are rather damaged, probably also due to human activity since this part is close to the bench-like pedestal running along the north, west and south wall in the rear part of the hall. On the top side of the lotus seat and the hair of the *kongqueling wang*, the paint layer is lost.

On the *yaowang pusa* side, damage to the paint layers is mainly restricted to the leaf-gilded parts and to top sides like the roofs of the pavilions.

## Deposits of material on the surfaces

The *kongqueling wang* side shows surfaces darkened by soot, especially on the bottom side of the lotus seat. On the front part, the surfaces are so blackened that the original colours are almost invisible (fig. 106 and 107). The soot has penetrated into the surface of the paint layer. In higher levels of the wall, the darkening by soot is less visible, but the homogenous brown "patina" of the lady with an infant (PK 9.8, fig. 97a) which is located close to the centre of the wall, presumably is caused by soot.

On the *yaowang pusa* side, the influence of soot is less visible or less recognisable. There are no areas as black as the lotus seat. Many white areas like faces and hands or the fish in area 2 show a brownish discoloration (fig. 109). A similar darkening is also visible on the heads of the small figures in the left (northern) part of the mountains above the *kongqueling wang* (especially PK 9.2 and PK 9.3). The effect is very similar to the discoloration observed at the west wall. It is not clear if it is caused by soot or dirt, a discoloured coating or some other material (cleaning with dirty or oily tissue ?). It does not seem to be related to the used pigment. It is also not clear if it is restricted to white areas or if it just is less obvious on other colours.

Some areas show the traces of continuous touching by the hands of visitors passing by. The most obvious example is the sculpture of a *lishi* (PK 9.48) close to the northern end of the wall where visitors can still touch the wall over or through the bars of the protective railing. The skin of the *lishi* is highly polished and rather dark meanwhile (fig. 108), inducing more people to touch and stroke it, as it could be observed several times.

## Discolorations caused by alteration of pigments

On the *kongqueling wang* side, the originally white highlights of the clouds have discoloured to a brownish or greyish tone. The same phenomenon was observed on the west wall where it is caused by the alteration of the white lead white into black lead sulphide, resulting in a darkening of the paint layer (fig. 110).

## Traces of careless work

The surfaces of the sculptures show many traces of working with clay, probably from the renovation in 1981-85. Blobs of clay plaster dripped down, clay suspension ran or dripped down (fig. 111), both leaving traces which were not removed. Many sculptures were touched by hands soiled with clay suspension, leaving ochre finger prints on the paint layers (fig. 112). Red drops on the surfaces come from painting the rafters or parts of the post construction (fig. 113).



Fig. 111 Drip of clay suspension on left eyelid of *yaowang pusa* 

#### Fig. 112

*Yaowang pusa*, area 2: Traces of touching sculptures with fingers soiled with clay (kneeling man on the right); clay plaster dripping down and attempt to wipe it off (standing man on the right, sleeve and lower part of robe)





Fig. 113 *Kongqueling wang*, numerous red drops from painting the rafters on the left knee.



Fig. 114 Terrace on the south wall next to area 1 of the *yaowang pusa* wall

Fig. 115 Terrace on south wall next to area 3 of the *yaowang pusa* wall





Fig. 116 Area 1 of the *yaowang pusa* wall before dusting, August 2010. A detached pendant was hung on the parapet.



Fig. 117 Area 1 after dusting and cleaning with vacuum cleaner, September 2010

## III. Soot, dirt and other accumulations on the surfaces

All the surfaces show accumulations of airborne dust and dirt. Less accessible areas may have been dusted the last time during the renovation in 1981-85. On the terraces on the *yaowang pusa* side, the accumulation of dust was about 1 cm thick (fig. 114 to 117). Behind the *yaowang pusa* even more materials had accrued. The gap behind the sculpture probably was not cleaned during the last renovation. The amount of dirt and dust was considerably reduced by the vacuum cleaning which preceded the survey.

In addition, a lot of detached fragments had been "stored" on terraces and other parts which provide suited surfaces. This kind of storage cannot be regarded as an adequate solution because it is not safe and sufficient enough for the conservation (fig. 116 and 114). Detached fragments were catalogued and stored in September 2010. Only a few could be re-attached to the wall.

On the top of the wall, on terraces and behind sculptures, materials from work on the wall were detected like wires, pieces of wood, blobs of clay plaster, strings, straw, broken tiles, splashes of different mortars, filling material and paint. None of these materials dates back to the Ming dynasty. They can all be assigned to repair phases. An accumulation of wheat husks behind the right door in area 4 of the *yaowang pusa* wall may come from the repair work in 1981-85 or be a deposit of a mouse. A skeleton of a rat was found in the layer of dust and debris on the left of the *yaowang pusa*, and a fragmentary skull of a small rodent (mouse, rat) or a bat, on one of the terraces.

Throwing coins and bills at the sculptures instead of putting them into the collection boxes is a disturbing, but obviously ineradicable habit of visitors. Countless coins and bills were retrieved from all crevices, gaps and joints that the walls possess. Even after the large amount was removed with brushes, a shoe box was filled with money found afterwards. The oldest was a bill from 1962. Coins and bills from the 1990's were found behind the plaster filling from 1981-85 at the left side of the *kongqueling wang*, creating a temporary confusion about the dating of the filling, but probably the money had come in through cracks at the neck of the *kongqueling wang* and fallen down behind the existing filling.

## MAPPING OF CONDITION

Recording and mapping of the condition of the figures and surfaces of the southern insertion wall was done by Milena Huber, Sina Setzer and Kao Ching-mei on paper together using drawings of the wall. Milena Huber prepared the electronic version based on the drawings on paper.<sup>10</sup>



<sup>&</sup>lt;sup>10</sup> The electronic files are made with *photoshop*.



Kongqueling wang side: condition of the wall



Kongqueling wang side: condition of the reliefs and sculptures



Kongqueling wang side: treatments in 2011



Yaowang pusa side: condition of the wall



Yaowang pusa side: condition of the reliefs and sculptures



Yaowang pusa side: replacements of 1981-85; part re-attached in 2011 ("pharmacy counter")

#### SURVEYING OF THE SOUTHERN INSERTION WALL 2010

#### Aim

The decision to measure the wall was aimed at investigating and understanding the construction of the wall. This included the construction of the wooden post system, the building technique of the wall, the connection system for sculptures and reliefs. For evaluating the state of damage of the wall and the construction system, deformations and shifted positions were recorded and assessed.

#### Base of the work and equipment

The surveying was done with very basic equipment. A scaffold made of iron bars was set up in front of both wall faces. The two scaffold parts were connected with each other with one bar at the northern edge of the wall to increase the stability. Three wooden planks on each side served as platform to stand on. The difficulty was that a stable scaffold had to be set up in a very limited space, close enough to the wall and yet leaving the distance necessitated for the measuring. On the *yaowang pusa* side, the main problem was to get close enough to the wall because the scaffold could only be set up in front of the dais, the vertical bars being positioned at a distance of 130 cm in front of the wall background. Because of the flexibility of the scaffolding, the strings for perpendiculars and horizontal levels had to be attached to places which were not connected with the scaffolding.

The measurements were taken with rulers and metal tape measure. Partly an electronic distance measuring device with laser light was used, too.

The measured data were recorded on the scaffold in prepared small-scale sketches and hand drawings. The person recording the data had to work on the scaffold to see and control the position of the measuring points and could not handle papers exceeding DIN A4 format there. Inside the hall, there was no possibility to provide a clean, dust-free table for drawing. The transfer of the data into drawings was done in the Shaanxi Institute for Conservation in Xi'an on two days during the time of work on-site, allowing to correct and add data afterwards. As it was not possible to return to the Shuilu'an anymore after September 22, some measurements especially on the *yaowang pusa* wall and the wooden post construction could not be counterchecked. The work of transferring the data into tables and the sketches into drawings was continued at the Shaanxi Institute for Conservation until October 2. The assessment of the data was completed after the return to Munich.

#### **Practical realisation**

After two weeks of preparation and vacuum cleaning, the survey was started on with setting up the strings. Taking the measurement required a group of people: one or two measuring while another one was recording the measured data. While three persons were involved in the measurements, the remaining two or three worked on the mapping or on the conservation of damaged fragments. With this constellation, taking the measuring data required eight days (about 40 hours). Finishing the drawings took 16 days (with one to four persons). Table 9 gives an overview of the consumption of time.



Fig. 118 Control of the floor level using a hose water level



Fig. 119 Measuring at the *kongqueling wang* with two horizontal levels and three perpendiculars

#### Table 9.

Calculation of time consumption for the survey

type of work	date	time (total)	number of persons
setting up the strings	Sept. 2, 3	11 hours	5
Measuring	Sept. 6, 7, 8, 9, 10,	40 hours	2-3, rarely 4
-	14, 15, 16		
Drawing	Sept. 13, 17, 22, 23	40 hours	4 persons
in the Institute for	Sept. 25, 26	18 hours	2 persons
Conservation	Sept. 28-31, Oct. 1	30 hours	1 person
Drawing in TUM	Oct. 7-11	30 hours	1 person
_			-

## Setting up the strings

The installation of the measuring appliance started with setting up the strings. The exact position was selected starting from two considerations:

- The strings should be as close to the wall as possible.
- All strings had to be attached without damaging the sculptures or reliefs.

There were three options for attaching the strings:

- Attaching the string to a part of the post construction in a suited height (cross beams and lintels etc.).

- Placing a nail to attach the string. This was only possible on parts where no original surface or part could be damaged.

- Inserting an appliance to attach the string like additional planks or bars.

A hose water level was used to guarantee that the transverse strings were perfectly horizontal (fig. 118).

## Upper horizontal level

On the *yaowang pusa* side, there was only one suited place to attach a string on the southern gable wall: A deep and big hole from a peg of a detached sculpture (the mule no. "box 15-1" was found to have belonged there). Thus, the horizontal level starting from this point was the first string to be set up (fig. 120 a: 1). The string was attached to a wooden wedge which was inserted into the hole. On the northern side an iron pole was connected to the beam running from column SIWN to the east, to which the string could be tied (fig. 120 a: P). This resulted in a horizontal line at the level of the chin of the *yaowang pusa* (fig. 122).

On the side of the *kongqueling wang*, the string could be attached to the upper beam between column SIWN (fig. 120 a: B) and the west wall and to a nail which could be driven into the replaced plaster of the south wall (fig. 120 a: 8). The level of the string was at the neck of *the kongqueling wang*, at a very convenient distance to the wall (fig. 122).

## Northern and southern perpendiculars

After the upper horizontal level on the *yaowang pusa* side had been installed, perpendiculars to the left and the right of the sculpture were installed. Permission was given by Zhao Liang to drive nails into the rafters for attaching the strings. For setting the positions, folding rules were pushed through openings between the rock columns of the mountain scenery to the other side (*kongqueling wang*). There were only two places where the folding rules could be inserted horizontally and at an angle of 90° to the perpendicular. These places were chosen as positions of the perpendiculars (fig. 120 a). On the *kongqueling wang* wall, the positions of the perpendiculars were placed along the folding rules sticking through the wall. A set of two strings was installed at each perpendicular to simplify the measuring (fig. 120 b and fig. 123).

#### Floor

The control measurement with the hose water level (fig. 118) proved that the floor in general is straight (horizontal), but uneven edges of single tiles result in differences in height (up to 1.5 cm). At the kink of the metal railings the floor on both sides has the same level. At the passage between the middle wall and the insertion wall, where all visitors pass through, the floor is up to 2 cm deeper. Towards the edges of the floor the level raises slightly.



a. Start to set up the strings for horizontal levels and perpendiculars for the survey



b. Upper horizontal levels and perpendiculars for the survey



c. Setting up the second pair of horizontal strings (lower level) and central perpendiculars

#### Fig. 120 a, b, c

Sequence to set up system of strings for perpendicular and horizontal levels



a. Section at the level of the pedestal





c. yaowang pusa, front view

Fig. 121 a, b, c

Positions of the strings; blue numbers: imprecise placing

▼ Fig. 122 Cross section of the wall with position of horizontal levels





Fig. 123

Measuring along double set of strings of the northern perpendicular of the kongqueling wang

Fig. 124 Measuring with folding rule and metal tape measure (yaowang pusa wall)



Fig. 125 Taking the measurements between peacock and lotus seat



#### Lower horizontal level

After the first horizontal string and the four perpendiculars had been installed, it became obvious that a second horizontal level was necessary at a lower level in order to reduce the distances to be measured. The only level on which the strings would not be too far away from the walls on both sides was found on the level just above the knees of the *yaowang pusa* and between lotus and neck of the peacock of the *kongqueling wang* (fig. 122). The scope to adjust the level at this height was less than 1 cm on both sides.

The lower horizontal strings had to be attached on additional appliances (fig. 120 c): On the south gable wall, a wooden slat was inserted temporarily to which the string could be tied (fig. 120c, fig. 126). The slat was clammed between bricks on the pedestal of the *yaowang pusa* and attached to the south gable wall with a string on a nail driven into a repaired area of a terrace. Another nail was inserted into a crack in area 5. At the northern end of the *yaowang pusa* wall, a bamboo chopstick was taped to the glass protection of the *wenshu pusa* to attach the string (fig. 120 c: 13, fig. 127). At the northern end of the *kongqueling wang* wall, a wooden prop had to be tied to the beams and the metal railing. At the southern end a nail could be driven into the clay wall (plaster completion of 1981-85). The set-up of these appliances with rather provisional means and the connection of the string was very time-consuming.

#### ▶ Fig. 126

Lower horizontal level, *yaowang pusa*: string attached to a wooden slat in front of the south gable wall

#### ▼ Fig. 127

Lower horizontal level, *yaowang pusa*: string attached on a chop stick taped to the protection glass of the *wenshu pusa* 





## Central perpendiculars

After measurements had been taken along the horizontal lines and the northern and southern perpendiculars, additional perpendiculars were set up at the vertical axis of the *yaowang pusa* and the *kongqueling wang*. This required the removal of the wooden planks next to the wall and thus was postponed until the other measurements had been finished.

## Impreciseness of the positions

A control measurement at the end of the first week of measuring (Sept. 10) revealed that the horizontal levels on the two sides were not perfectly parallel to each other (fig. 121). The deviation was included into the survey (fig. 121 a, fig. 134).

Another problem was that the horizontal strings tended to sag and to get loose. Moreover, on the *kongqueling wang side*, the upper horizontal string was snatched off by mistake several times, and the attachment point on the south wall could not be reinstalled precisely enough. This caused deviances in the vertical measurements of the *kongqueling wang* side (fig. 121 b) which could not be completely cleared out because not all the measurements could be repeated.



Fig. 128 Noting measurements and correcting drawings in the temple

## Drawings and documentation of the survey

When the measurements were taken, the data were recorded in hand drawings or tables which could be made while working on the scaffold. The measurements were transferred into drawings in the scale of 1:10. The rather big drawings allowed to mark also small details precisely. The data of each measuring point was additionally listed in tables.

Altogether there are 17 drawings which are shown in small scale on the following pages:

- a. Frontal views and sections through the wall (the originals in A 2 format):
- frontal view of kongqueling wang wall
- frontal view of yaowang pusa wall
- side view of the southern insertion wall from south
- section through southern insertion wall from south
- section through southern insertion wall from north
- section through southern insertion wall from top at the upper horizontal level
- b. Sections along levels and perpendiculars (originals in A 3 format):
- two horizontal sections (upper and lower horizontal level) of each side
- three vertical sections (northern, central and southern perpendiculars) of each side
- top view of the dais of the yaowang pusa











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# Sections along perpendicular and horizontal levels

# Kongqueling wang



Kongqueling wang, upper horizontal level (height of head of tier 3 / clouds below tier 2)










Fig. 139 Kongqueling wang, central perpendicular

Fig. 140 Central perpendicular with measuring data



Fig. 141 Kongqueling wang, north perpendicular



## Sections along perpendicular and horizontal levels

Yaowang pusa















Fig. 146 Yaowang pusa, south perpendicular

Fig. 147 South perpendicular with measuring data



Fig. 148 Yaowang pusa, central perpendicular

Fig. 149 Central perpendicular with measuring data



# FRAGMENTS OF THE UPPER PART AND THE COLLAPSED CANOPY OF THE KONGQUELING WANG WALL

Above the head of the *kongqueling wang*, a large part of the relief decoration is missing today (fig. 152). The lower part (maximum 70 cm high and 60 cm wide) belonged to the nimbus formed by peacock feathers. The shape of the nimbus can be reconstructed from the preserved parts (fig. 152, white line). Above the area taken up by the nimbus, a large loss of maximum 85 cm in height and 100 cm in width exposes the top of the adobe brick wall and the support beam of the mountains. There are no clues to the original design of this area on the wall. A single rock column which fell down recently, may have been positioned on the left side of the loss. It had been remodelled in 1981-85 and was hanging upside down in 2001 (fig. 152, marked with "x").



Fig. 152

Kongqueling wang wall in 2001 [Scheder 2001]

Red line: Large loss above the head of the *kongqueling wang*. White line: Original outline of the peacock feather nimbus. In September 2010 the single rock (x) with completions of the renovation in 1981-85 had fallen down.

So far, we do not know any photographs taken before 2001 that show the part of the wall decoration which is lost today. A photograph in FAN / ZHANG 1983 proves that there were already large losses in the upper part of the nimbus at that time, but the part above the nimbus is cut-off in the picture (fig. 153).<sup>11</sup>

According to FAN Juan 1994 the upper part of the peacock feather nimbus was damaged by water penetrating through the roof, probably between 1959 and 1981.<sup>12</sup> She writes that the canopy of the *kongqueling wang* collapsed on September 2, 1990, caused by the percussion of an airplane passing by<sup>13</sup>, and that the fragments were collected and stored, but she neither describes the design nor the condition of the parts nor the place of storage.

<sup>&</sup>lt;sup>11</sup> FAN / ZHANG 1983, 4<sup>th</sup> photograph (without page numbers).

<sup>&</sup>lt;sup>12</sup> FAN Juan 1994, p. 112. Table 1: Chronology of restoration projects in the Shuilu hall. The German translation, at least, does not indicate clearly if the damage occurred between 1822 and 1959 or after an insufficient repair in 1959. The latter seems more probable.

<sup>&</sup>lt;sup>13</sup> FAN Juan 1994, p. 118.

In 2007, all the fragments in the rear part of the hall were collected and catalogued.<sup>14</sup> Only two peacock feathers, both completions of the renovation in 1981-85, were found. Thus it was clear that the parts which had fallen down in 1990 were not stored somewhere inside the hall.



### Fig. 153

*Kongqueling wang* in FAN / ZHANG 1983 (4<sup>th</sup> page of pictures without number). The picture was printed mirror-inverted and is adjusted here.

<sup>&</sup>lt;sup>14</sup> See: Annual report 2007-2009, p. 195-204.

### Rediscovering missing parts of the wall

During the work stay in 2010, two cardboard boxes were detected in the south annex of the hall. They contained fragments of clay reliefs. According to Zhao Liang the boxes were already stored in this place when he started to work at the temple in 1991.

The two boxes were standing piled up on top of each other. Below there was a wooden crate. On August 26, 2010, the boxes were taken to the courtyard and unpacked. The cardboard of the boxes was so decayed that the heavy boxes could not be lifted anymore. The upper box was shifted onto a wooden plate as temporary support (fig. 154), the lower one was moved together with the wooden crate (fig. 155). The crate did not contain clay fragments, but parts of old lamps and electrification.



Fig. 154 The upper box before unpacking



Fig. 155 The lower box before unpacking, standing on a crate

### Fig. 156

Arranging the fragments in the courtyard and sorting them



Fig. 157 Packing the fragments in

Packing the fragments into boxes for storage after numbering and photographing



### Contents of the boxes

The fragments were carefully taken from the boxes and laid out in the courtyard. They were covered with dirt and dust and had to be dusted off. They were rather damp because of the high humidity during this rainy period of the year which led to an increased tendency to break under their own weight. Bigger and heavier fragments had obviously crushed the ones below, resulting in more fragments and many broken parts.

After the boxes had been unpacked, the 166 fragments were arranged into different groups according to shape and colour. Figures 172-176 show the fragments after having been sorted and numbered. The fragments could be assigned to four groups:

- A) 123 fragments from rock background, some being completions from the intervention in 1981-85 intervention, including some small clouds
- B) 3 fragments of a red big *piaodai* (flying band) of the canopy (the other one being preserved on the wall)
- C) 28 fragments of 2 big and 8 smaller clouds
- D) 32 fragments of drapery and related decoration

The fragments were numbered and catalogued in a list.<sup>15</sup> The numbering system includes letters for the groups (K for *kongqueling wang*) and numbers for the single fragments:

- K 1-126 mountains and *piaodai*
- KC 1-10 clouds (C = cloud)
- KB 1-33 canopy (B = canopy, in German "Baldachin")

## The canopy

The fragments of group D comprise a large circle section with a bamboo core, fragments of hanging drapery in green, red and gold, and four leaf-shaped elements. The examination of these elements made it possible to identify the fragments as parts of the canopy which had been positioned over the head of the *kongqueling wang*.

An approximation to the shape and the style of the canopy can be derived from the canopy of other figures in the hall: The *puxian pusa*, the *guanyin* and the *wenshu pusa* in the rear part of the hall, the *baoshen fo* and the *yingshen fo* at the east wall in the front part of the hall possess a canopy (fig. 158). They are slightly different, but similar in the essential lines of their construction: An imitation of a short textile curtain is attached to a ring-shaped element, the larger part hanging down. Leaf-shaped elements or a small "tent" form a "ceiling" above the ring. The ring is red and always decorated with small gilded rosettes and cloud-shaped elements (except for the *baoshen fo*, where the ring is not visible). Cloud-shaped cantilevers protrude to the front, being attached either in the middle of the ring or on top of it. From these cloud cantilevers, strings of beads are hanging, forming a bead curtain. Inside the canopy two flying bands (*piaodai*) are attached to the wall. Starting from the level of the ring, they swing out to both sides, lowering in a curve underneath the canopy and then swinging upwards. At all preserved examples, the *piaodai* are painted red.

<sup>&</sup>lt;sup>15</sup> See: *List of findings 2007 to 2010* at the end of this report.



guanyin

wenshu pusa

Fig. 158 Four of the preserved canopies in the Shuilu hall.

The canopies differ in the design of the details, in size and shape. The biggest one is that of the *guanyin* (fig. 158, lower left), the smallest one that of the *baoshen fo* (fig. 158, upper left). They have the shape of a complete ellipse (*baoshen fo*) or only of a section of an ellipse (*guanyin, wenshu pusa*). The "ceiling" can be shaped like a tent (*yingshen fo*), like a crown (*puxian pusa, wenshu pusa*), an open-work construction of leaf-shaped elements (*guanyin*), or be absent (*baoshen fo*). The construction of the canopy of the *guanyin* (fig. 159) is most similar to the one that can now be reconstructed for the *kongqueling wang*, but is much bigger. It possesses five leaf-shaped elements, which form a dome, and has the shape of a semi-ellipse. The canopy of the *baoshen fo* shows the same style of a textile curtain with two levels of drapery and a row of golden cloud elements, but a different construction as a complete elliptical ring.

Fig. 159 Detail of the canopy of the *guanyin* with leafshaped elements forming the open-work ceiling



### The construction of the canopy of the kongqueling wang

The fragments of the canopy belong to different parts: a ring painted red, a drapery hanging from that ring, a smaller part of drapery sticking up above the ring, and elements forming the "ceiling" of the canopy. Table 10 gives an overview of the different parts.

Table 10. Overview of the elements of the canopy

part	height in cm	colour	sketch
- upper drapery, sticking up above the ring	2-3	pink, partly with gold on pink	
- ring with rectangular cross section	4	red decorations gold on pink	
- decoration of clouds ("eaves tile" element) on green drapery	3.5	gold on pink	Mart
- drapery below the ring: upper part	6 (from ring)	green	
- lower part	11-12 (from ring)	red, border gold on nink	
- four leave-shaped elements	not measured	not painted	KB4
- three cloud-shaped protruding arms, one still attached to the ring	not measured	gold on pink	
- two iron anchors	1x 1, L 45		

The supporting structure of the canopy was hidden inside the ring: Inside the fragment KB 5 of the ring, there is a bundle of bamboo poles. It consists of four thin bamboo poles with a diameter of maximum 0.6 cm. They were wrapped with a layer of plant fibres, maybe made of reed leaves. The wrapping was tied together with thin strings, probably made of hemp (fig. 160 and 161). Around the bamboo core the ring element was formed. The drapery then was attached to the ring element.

Four leaf-shaped elements of the "ceiling" are preserved. For reason of symmetry it can be assumed that originally there had been five. Inside each leaf-shaped element there is an iron rod of about 0.6 cm in diameter. It was wrapped with plant fibres to increase the adhesion between metal and clay. The cloud arms are also formed over an iron rod. In the case of KB 5, a cloud arm and a leaf-shaped element are attached at the same place to the bamboo ring (fig. 161).



Fig. 160

Inner structure of the canopy: ring modelled over semielliptical bamboo construction, drapery attached to ring, leaf-shaped element of the ceiling and protruding arm





Fragment KB 5 with bamboo poles, preserved parts of ring and drapery and one of the leaf-shaped elements

Two iron elements were found. They are rectangular in cross section, measuring  $1 \times 1$  cm. The longer one is complete. It is 45 cm long, bent in the middle and pointed toward the tip. The shorter one is broken, only a part is preserved. The two iron elements probably served to keep the canopy up.

When the canopy was made, as a first step, probably, these iron elements were inserted into the wall. As the next step, the bamboo ring was attached to the iron elements (fig. 162). Then the clay modelling was applied to this structure. There are two holes from constructional elements in the upper part of the peacock feather nimbus. It can be assumed that the iron elements were inserted there.

The break of one iron element could have caused the canopy to fall down, but it is also possible that the corroded iron broke when the canopy came down or when it hit the floor.

A wooden peg preserved in the wall may have been another connection of the canopy with the wall. It is inserted below the first row of adobe bricks and positioned approximately in the vertical axis of the *kongqueling wang*'s head (fig. 163, black arrow).

Fig. 162 Construction with bent iron and bamboo ring



Fig. 163

The preserved iron support inserted in one of the existing holes in the wall; black arrow: wooden peg



The canopy is broken into many fragments, and parts are missing. The green drapery was found to be complete: All the fragments can be attached to each other. The ones at the end still show marks of their connection to the wall. If opened out, the green drapery has a length of 110 cm (fig. 164).



### Fig. 164

Fragments of the canopy laid out in fitting sequence

When fragment KB 30 is put on the right side of KB 5, it becomes evident that the bamboo ring, too, measured 110 cm in length (fig. 165). This means that the bamboo ring is broken off between KB 5 and KB 30 and that only the part behind KB 30 is missing today (i.e. 34 cm). Today the bamboo ring measures 73 cm in width and 33 cm in depth. The measuring of the *kongqueling wang* wall revealed that it is not possible to fit in a canopy of 73 cm width into the damaged area. The greatest possible width can be estimated to be about 60 cm. It seems probable that the bamboo ring widened up after the tension on the poles had relaxed. If we assume a width of 60 cm, the maximum depth towards the wall increases to about 43 cm (fig. 166).



Circumference, shape and size of the canopy today

Shape and size of the canopy at a width of 60 cm

There was no time for a detailed examination of this canopy and the other ones during the work stay of 2010. The construction of the canopies inside the hall can only be investigated with the aid of a scaffold which was not available in September 2010. For this reason, the reconstruction of the canopy of the *kongqueling wang* in fig. 167 is just an estimation and preliminary. The exact position of the canopy, too, could not be determined yet.



Fig. 167 Preliminary reconstruction of the canopy with a width of 60 cm

### *Piaodai* (flying bands)

Parts of two piaodai, situated above the peacock feather nimbus of the kongqueling wang, are preserved: On its northern (left) side, there is a rest of a *piaodai* hanging fragilely on a wooden peg (fig. 168: red arrow). Fragments of this piaodai were found on the floor just before the work started in August 2010. Parts of another piaodai (presumably the corresponding one) were identified among the fragments inside the two boxes (K124-126, fig. 169). Both *piaodai* were painted red, but the one on the wall appears almost white due to the loss of most of the pigment layer.

Fig. 169

Fig. 168

Fragments of northern *pioadai* preserved on the wall



### Clouds

Ten clouds of different size were found in the boxes containing the canopy.

One is flat, stretched and green (KC 8). It could have been attached to the front of a part of the canopy or to the mountain reliefs. The pink fragments no. KC 5, 6 and 9 may belong to a cloud whirl that had been situated at the right of the peacock feather nimbus, corresponding to the green one on the left side taken down in September 2010. There was no time, however, to check if the fracture edges are fitting.

There are two medium size clouds and two very big clouds:

Table 11.

Dimensions	of c	louds

cloud no.	max. dimensions of preserved parts in cm
KC 1	19.2 x 11.4
KC 2	18 x 18.5
KC 3	52 x 41
KC 4	50 x 38

The original position of the big clouds KC 3 and KC 4 could not be determined yet. The clouds are too big to insert them below the canopy, and the photograph from 1983 proves that there were no clouds in the upper part of the peacock fan nimbus<sup>16</sup>, but they also cannot be fitted in satisfyingly above the canopy.

Photographs taken before 1990 would enormously help to reconstruct the situation, but until now none is known. For further investigation, the fragments of the clouds should be assembled and glued together, so that the clouds can be handled as one part each.

### **Mountains**

No attempt was made to assemble the 123 fragments of mountains and their background. So far, it was not possible to find sufficient clues to the dimension, design or structure of the mountain parts they come from.

Some fragments show that parts of them were remodelled or completed or even reconstructed in the 1981-85 restoration of the hall. Fragments K 54 to 56 and the two clouds K 69/70 and K74/75 are replacements from 1981-85.

Among the fragments of the original modelling, some parts can be identified:

- K 48 is a mountain column of ca. 55 cm length.
- K 50, 51, 91, 92, 101, 102, 103, 104 and 105 are bigger fragments of the mountain relief.
- Fragments with rounded surface (like a small mound) come from open-work mountain areas, as well as the column-like mountain "stem" K 121.
- K 60 is a "flower"-shaped element. Two similar ones are preserved in the upper mountain area on the left side of the wall.
- K 93/94 is a cloud broken into two parts. It is of the same type as the clouds in the mountain areas preserved on the wall.

<sup>16</sup> Photograph in FAN / ZHANG 1983, see fig. 2.

### **Storing the fragments**

All the fragments were dusted off. Some fragments were so fragile that they had to be stabilised. Small broken-off parts were re-attached to big fragments to prevent the small pieces from getting lost.

After the "emergency conservation" treatment, the fragments were packed in 20 cardboard boxes (banana boxes). The small fragments were collected and stored together with the ones they belong to. The boxes were stored in the south annex, in a new shelf built for this purpose. The shelf is made of metal and painted. It possesses a dust-proof cover which can be opened using zippers (figs. 170 and 171). The shelf is 300 cm high, 210 cm wide and 55 cm deep. At the moment, it shelters 41 boxes and two big rock columns.

Fig 170 Shelf with open cover in south annex, filled with Shelf with closed dust-proof cover boxes, Sept. 21, 2010



Fig. 171



### Overview of the fragments arranged in groups

Fragments K: Mountains and background



Fig. 172: K-1 to K-20



Fig. 173: K-21 to K-45



Fig. 174: K-46 to K-56



Fig. 175: K-57 to K-83



Fig. 176: K-84 to K-124

### Fragments KC: Clouds



Fig. 177 a-j Cloud fragments arranged in 10 groups (KC 1 to KC 10)

8 8

# <image><image>

Fig. 178 Fragments of canopy laid out in the courtyard

Fragments KB: canopy

### CONSERVATION TREATMENT CARRIED OUT IN 2010

As conservation treatments were not scheduled for the work stay in 2010, treatments were restricted to those necessary for the preparation of the survey and mapping and to "emergency" measures to prevent immediate damage and losses. The conservation treatments comprised:

- dusting the wall and the findings
- consolidation of very fragile parts (partly only temporary fixation)
- re-attachment of loose and detached parts
- stabilisation of figure PY 10.25

### Dusting

Before the survey could be started, both sides of the wall were dusted off using soft paint brushes and a vacuum cleaner. Although still performed superficially, the dusting was a timeconsuming work (it took six days). Dust was stirred up again by working on the scaffold close to not cleaned walls, and it was unavoidable that the wooden construction and other areas covered in dust were touched. Thus some surfaces, especially the top sides, were dusted off again at the end of the work.

### Consolidation and reconnection of broken and detached parts

### Used materials and recipes

For stabilising and re-connecting ("gluing") broken parts, three different clay mixtures were prepared following the recipes developed since 2007.<sup>17</sup> All mixtures were based on "black earth" taken from the mountain flank next to the temple in 2009. The mixtures were designed for the following purposes:

- thin clay suspension for moistening surfaces before reconnecting them: suspension of black earth in water, addition of Tylose MH 300 (3% in water)
- mixture for reconnecting without filling: black earth with addition of sieved sand (water : clay : sand, parts of volume 10 : 10 : 2; recipe HFM 2)
- mixture for filling larger voids: mixture of black earth with micro-balloons and addition of Tylose HM 300 (water : black earth : Scotchlite  $K1^{18}$  : Tylose MH 300, 3% in water, parts of volume 4 : 6 : 15 : 2; recipe HFM 8. An additional amount of water had to be added to obtain a material suited for injection. The amount of water resulted from the alteration of the viscosity and was not measured).

<sup>&</sup>lt;sup>17</sup> For the recipes see: *Annual report* 2007-2009, p. 174-177.

<sup>&</sup>lt;sup>18</sup> Glass microspheres or micro-balloons.



### Kongqueling wang wall

Table 12 gives an overview of the stabilised and re-attached parts of the *kongqueling wang* wall.

Table 12.

Overview of loose and detached parts of the *kongqueling wang* wall conserved in 2010

Stabilised parts	treatment
fragmented flying band (piaodai) left over from the	piaodai tied to the wooden peg using cotton strings.
large loss above the head of the <i>kongqueling wang</i>	Additionally stabilised with strings attached to the
	support pole inside the mountains (see: <i>Current</i>
Re-attached parts	position
finding no. Box 20-11, part of collar of a <i>tianwang</i>	re-attached to figure PK9.49 (fig. 179)
finding no. Box 21-9, arm of a <i>tianwang</i> ,	re-attached to figure PK9.49 (fig. 180)
9 x 11 x 4.5 cm	
finding no. Box 21-10, part of flower-shaped element	re-attached to flower-shaped element below PK9.3
in the mountains, 1 x 3.5 x 1 cm	(fig. 181)
finding no. Box 21-11, part of decoration of a hat, 1 x 3 x 1 cm	re-attached to figure PK9.21, left side (fig. 182)
finding no. Box 21-12, part of decoration of a hat,	re-attached to figure PK9.10 (fig. 183)
1 x 2.5 x 1 cm	
loose peacock feather: detached and re-attached	lowest feather above lotus seat, left (northern) side
again	
lady with infant, PK 9.8, finding no. Box 6-1	inserted into mountains as PK 9.8 (fig. 188), not re-
20 cm high	attached yet
detached flower-shaped element above PK 9.7	re-attached to mountains on pole (fig. 188)

### Flying band (piaodai) of canopy

The fragmented northern *piaodai* of the canopy preserved on the wall is extremely fragile: Parts tend to break away from the wire core, as happened for the last time in August 2010 (see: *Current situation of damage*). Additionally the *piaodai* is attached to the wooden peg only by a thin hemp string partly severed. The wooden peg itself is loose. As a temporary fixation the *piaodai* was fastened to the peg with cotton strings. Strings fastened to the ends of the wire prevent further movements which would result in additional losses (see: *Current situation of damage*, fig. 99). The strings cannot be removed without endangering the *piaodai* to come down.

### *Lady with infant (box 6-1)*

In 2007, a small sculpture had been detected wedged in between the sculptures S6.3 and S6.4 of the south wall.<sup>19</sup> The headless sculpture of a lady with a nude infant on her left arm measures 20 cm from feet to shoulders and thus is too small to belong to the decoration of the south wall. It had been stored as finding with the number "Box 6-1" (fig. 184). The photograph of the *kongqueling wang* wall taken by S. Scheder in 2001 allowed identifying the lady as sculpture PK 9.8, on the left (northern) side of the mountains (fig. 185). At that time she still had a head.

<sup>&</sup>lt;sup>19</sup> The south wall could not be photographed in 2007 because it was hidden behind the two wardrobes. A photograph of the south wall showing the small figure wedged between the larger ones of the south wall can be found in 影像水陆俺 *Images of Shuilu'an* 2009, p. 45.

The sculpture can be put back to its original position at the mountain ridge, but the mountain is broken and unstable (fig. 186). It has to be stabilised and re-attached to the wall before the sculpture of the lady can be reconnected definitely. It was temporarily inserted and secured with strings which were tied around the rock column and from there to the pole behind (fig. 188). The strings must no be removed before the mountain relief is conserved properly.





Fig. 185 PK 9.8 in 2001 [from: Scheder 2001; detail blown up from overall view of the wall, resulting in rather low resolution ]

Fig. 184 Lady with infant PK 9.8 in 2007, listed as finding no. "Box 6-1"

### Flower-shaped element, part of mountain

At the same area of the mountains, two smaller parts of the landscape relief had got detached. A "flower-shaped" element (probably representing a tree) was standing endangered and completely detached on top of the pole (fig. 187). It was removed to prevent it from falling down (fig. 186). It had been detached and reconnected already in 1981-85, as traces of clay suspension prove. It was re-attached again using the mixture HFM 8 and secured with strings during the drying time (fig. 188). In the same way, a rounded part of the mountain background next to PK9.3 was treated (fig. 189). As both elements were re-attached during the last day of work on September 21<sup>st</sup>, 2010, the efficiency of the treatment could not be checked.



Mountains without PK 9.8 and "flower-shaped" element, situation in September 2010



Fig. 187 PK 9.8 and "flower-shaped" element inserted temporarily, September 8, 2010

Fig. 188 PK 9.8 held in place with strings; "flower-shaped" element re-attached and secured with strings



### Fig. 189 Detached part of

Detached part of mountain re-attached and secured with strings during drying





Fig. 194

Fig. 190 Re-assembling KB 4

Fig. 191 Reconnecting KB 15, in the foreground KB 16 and 24



Fig. 192 Stabilising fragment KB 23 of the canopy in an improvised workshop situation inside the Shuilu hall

Fig. 193 Fragment KB 23 after dusting





Table 13.

### Canopy of kongqueling wang (findings KB)

Only the parts of the canopy (finding with the numbers "KB") have been treated. The fragile and endangered clouds were just stored. The table 13 gives an overview of treated parts of the canopy.

The fragments of the canopy were dusted off without touching the surface. They were laid out in the courtyard on a warm sunny day, allowing them to dry. After storing them into boxes at the evening of the same day, the boxes were left open. The boxes with the big clouds were exposed to the drier air of the courtyard on the following day again.

Many of the 166 fragments of the canopy of the *kongqueling wang* were extremely fragile. They had suffered from inadequate storage conditions over the last 20 years. Several fragments were broken or had lost their strength under the weight of a heavy fragment lying on top; some of them were breaking completely when they were lifted from the decayed boxes. The fracture edges were very sensible. In addition, the situation was negatively influenced by the high humidity during the working period, resulting in even more sensitive fracture edges and surfaces. For this reason, the fragments had to be handled with extreme care.

The fragments of the hanging drapery were especially fragile and endangered: Broken into several parts, they were too fragile to lift them again. Thin flat and long parts had broken many times. Some of them had broken into separated fragments. Others were structurally weakened: they were still joined together, but only with extreme fragility. They had to be consolidated prior to storage.

Stabilised parts	Treatment	
KB 2	stabilised along cracks and between clay and iron core;	
leaf-shaped ceiling element	detached "leaf" reconnected	
KB 3	stabilised along cracks; detached "leaf" reconnected	
leaf-shaped ceiling element		
KB 4	stabilised along cracks; detached "leaf" reconnected	
leaf-shaped ceiling element		
KB 15	three parts reconnected	
pink upper textile rim		
KB 18	parts reconnected, stabilised along cracks	
pink upper textile rim		
KB 19	reconnected at break in the centre	
part of red ring		
KB 20	parts reconnected	
fragment of red ring		
KB 22	broken and almost detached parts reconnected; structurally	
fragment of hanging drapery	weakened areas stabilised	
KB 24	stabilised along cracks;	
fragment of hanging drapery	structurally weakened areas stabilised	
Parts assembled to form a larger fragment	Position	
KB 23, KB 27	parts reconnected and stabilised (figs. 192, 193, 194), then	
fragments of hanging drapery	reconnected to each other	
KB 25, KB 26	reconnected with each other	
fragments of hanging drapery		
KB 12, KB 13 to KB 29: cloud-shaped arm	two small fragments re-attached to the bottom end of arm KB 9	
KB 8 to KB 28	small fragments re-attached to bottom end of the arm KB 8	
KB 16 to KB 5	small fragment KB 16 of pink upper textile reconnected to KB 5	

Parts of canopy which were stabilised by aligning broken parts or parts assembled from single findings



Fig. 195 Area 2 after cleaning

Fig. 196 Area 2 after re-attaching "fish lady" (September 21, 2010)



### Yaowang pusa wall

Numerous fragments were found on the terraces or behind sculptures during the cleaning. On the yaowang pusa side, most fragments were found on top or in front of the southern end of the dais (i.e. between the south gable wall and the yaowang pusa wall). At the request of the Shaanxi Institute for Conservation detached parts which could be assigned to their original positions were re-attached to the wall. Some of the fragments had to be stabilised or reassembled before they could be fixed to the wall. Table 14 gives an overview of stabilised and re-attached parts.

Table 14.

Stabilised and re-attached parts on the yaowang pusa wall

Stabilised parts	treatment
box 18-1, fish lady	head reconnected to body (fig. 204 and 205)
PY10.15 "pharmacy counter" (finding box 14-16, additionally 14-14 and 14-4)	vertical arm of balance stabilised, detached horizontal beam reconnected; right hand of man, lower part of body (box 14- 4) and foot of counter (box 14-14) reconnected
box 16-16, thin long band (part of stole ?)	attempt to realign it failed; temporarily fastened with strings, stored
box 14-5, hairpin of yaowang pusa	two loose petals reconnected by injection of clay suspension, stored
box 15-1, mule	head re-attached to neck, missing part completed with clay mixture HFM 8. Both legs stabilised by injection (HFM 2 with addition of Tylose MH300), stored
Re-attached parts	position
box 18-1, "fish lady"	re-attached to pond in area 2 (fig. 195 and 196)
box 14-1, part of green lintel of main pavilion, found in area 4	re-attached to lintel in area 4; stabilised on backside with bamboo stick (fig. 201)
box 14-8, small fragment of pilaster	attached to box 14-1 (fig. 198)
box 14-17 and 14-8 glued together	re-attached to left pilaster of main pavilion in area 3 (fig. 200)
box 14-4, legs of a standing person	re-attached to "pharmacy counter" (fig. 206)
box 14-14, pinnacle	re-attached as leg of "pharmacy counter" (fig. 208)
"pharmacy counter" PY10.15, together with box 14-4, box 14-14	re-attached to wall (fig. 213)
south gable wall, parapet element from 1981-85; detached after a nail for supporting the string of the horizontal level had been inserted into the terrace	broken pinnacle re-attached to main part; after drying re- attached to the wall 3 (fig. 197)

### Fig. 197

Terrace on south gable wall next to area 3, before and after inserting the detached element of the parapet









Fig. 198 Pilaster decoration, fragment 14-17 (large piece) and 14-8 (small piece)



Fig. 201 Fragment 14-1 after finding



Fig. 199 Pilaster behind left pillar of central pavilion in area 3, before treatment

Fig. 200 Pilaster after re-attaching the decoration element



Fig. 202 Bamboo stick on the backside fixed with strings during drying

Fig. 203 After fitting in the fragment, small clamps (hair clips) were used to stabilise the lintel during drying



### Area 2, "fish lady", finding no. box 18-1

During dusting the yaowang pusa side, a small figure with the body of a fish and the head of a young woman was found lying at the lower edge of the pond. There is another figure with fish body and human head in the same pond: a man with a wu liang guan-cap (high cap with five ridges). The "fish lady" was broken at the neck where the mould-made fish body had been attached to the head (fig. 204 and 205). There is a recessing lacuna in the middle of the body, probably from a lost part (a second fin). There are three positions inside the pond where parts (fish?, turtles?) got lost. Comparing the imprints left by the lost elements, the "fish lady" could be assigned to the position in the centre (fig. 195) and could be reattached there (fig. 196).



Fig. 204 "Fish lady", box 18-1, after finding

Fig. 205 After dusting and realigning the head

### Areas 3 and 4

On the terraces of areas 3 and 4, numerous detached fragments were found when the dusting was started. Especially the terrace of area 4 was full of detached figures, objects and fragments (fig. 215). Some of the fragments belonged to area 4, like a part of the broken lintel (box 14-1, fig. 201) and two fragments of a pilaster decoration (box 14-8 and 14-17, fig. 198), or to areas close to it (parts of the whiskers of the dragon next to area 4, box 14-10 and 11, and hairpin of the *yaowang pusa*, box 14-5). Others could not be assigned to any position and probably do not belong to the *yaowang pusa* wall at all, as for example a headless lady (box 14-2) and a hand (box 14-6), both probably from the southern gable wall. The cloud (box 14-12) and tassel (box 16b-15) hanging on the parapet (fig. 116) do not belong to area 3, maybe not even to the *yaowang pusa* wall. This means that the fragments lying on the terraces did not necessarily come from a nearby place, but to a large amount were placed there by somebody who picked up detached fragments.

### Lintel and pilaster of pavilion in area 4

Two fragments of the pilaster decoration behind the left pillar (fig. 198) were reconnected and attached to the pavilion (fig. 200).

A fragment (box 14-1, fig. 201) was recognised to belong to the lintel of the pavilion of area 4. It could not be fitted in perfectly because the part next to it was also loose and deformed. During an attempt to fit the fragment (box 14-1, fig. 201) in, the fragment broke into two pieces along an existing crack. The fracture edges of the fragment no. box 14-1 had to be cut off slightly to insert the part without pressure. As a connection on the tiny fracture edges would not have been sufficient, a bamboo stick bridging the damaged part was attached on the back of the lintel (fig. 202). During the time of drying, the bamboo stick was fixed with strings and small clamps (hair clips; fig. 203).



Fig. 206 Fragment box 14-4, found in area 4



Fig. 208 Fragment box 14-14, found in area 3



Fig. 209 Fragment box 14-3, found in area 4



Fig. 207 "Pharmacy counter" PY10.15 (box 14-16), found in area 4, with reconnected leg (box 14-14)









### Fig. 210

PY10.15 in the sand bed after re-attaching the left leg and stabilising it with an imbedded bamboo stick

### Fig. 211

Back of PY.15 after re-attaching the lower part of the man (box 14-4); joint secured with hemp paper strip under clay suspension

### fig. 212

PY10.25 prepared to be attached to the wall with a blob of clay (HFM 8)

➡ Fig. 213
Final situation in area 3. Underneath the counter, the two adobe blocks used as base are visible.

### PY 10.15, "pharmacy counter" - from area 3 to area 4

In the central pavilion of area 4, a sculpture of a man behind a table was found and listed as finding "box 14-16"; it had been numbered as PY 10.15 in 2001 (fig. 207). The headless man is holding an instrument which could be a balance. The sculpture was provisionally called "pharmacy counter". The sculpture was loose, leaning lopsided against the background. The figure of the man was broken off at the level of the hip, a support underneath was missing. If put upright, the "pharmacy counter" could touch the ground only with the right front leg, unable to stand on its own. The imprints on the back of the central pavilion in area 4 showed that PY 10.15 did not belong there: the outlines of two sculptures are recognisable, and the ledge at the background is too low to stabilise PY 10.15. Margins of the priming layer showed that PY 10.15 belongs into the pavilion of area 3. There are also identical traces of a run-down priming layer on the back of the pavilion and the backside of the man behind the counter (fig. 212). The second leg of the counter was found on the terrace of area 3 (fig. 208).

There are no traces of clay material in the area behind the counter, what means that the counter had had no fixation to the floor or the back of the pavilion. Some time later, an unpainted fragment of a figure found in area 4 was recognised to be the lower part of the man (box 14-4, fig. 206). It could be attached fittingly, but it is too short to support the counter (fig. 212): Another piece was necessary as a base for the man to stand on. As this was missing, a base was made of two blocks cut from broken adobe bricks which were adjusted in height and shape. The work was time-consuming as the floor of the terrace is not straight and slopes forward, and the adjustment had to be managed without inserting the counter with its fragile leg and "balance" too often. The correct position and height were deduced from the marks of the priming layer. After the counter had been reinserted, another fragment was noticed which could have been the (original ?) support: a small square object in the shape of a basin and made of terracotta, looking like a small dish to insert incense sticks (box 14-3, measuring 8 x 8.5 x 4 cm), which was found in area 4 (fig. 209, fig. 215: lying in the centre, in front of PY 10.15). It has approximately the right dimensions and was never connected to something with clay. Maybe it was used as a "ready-made" support when the artisans realised that the counter needed a support.

The broken-off leg was reconnected to the counter. A thin bamboo stick was attached to the back, imbedded into a layer of clay suspension to increase the stability (fig. 212). The lower part of the man's body was reconnected to the counter with clay suspension. A layer of hemp paper imbedded in clay suspension was placed over the joint to prevent a new fracture during the insertion into the pavilion of area 3 (fig. 211). The clay modelling around the wire of the balance was re-attached with clay suspension. The broken right hand was joined to the wrist. Although originally PY 10.15 was not mounted to the back or the floor with clay, it was decided to do both to guarantee the stability: The two blocks of the base were attached to the floor of the terrace with clay (HFM 8, fig. 213). A blob of the same mixture was applied on the man's back (fig. 212) and on top of the base blocks before PY 10.15 was put into its position. Afterwards the balance and the right hand had to be stabilised again. PY 10.15 was left unsupported for drying as it was impossible to insert a prop as temporary fixation.



Fig. 214 Area 3 before dusting

Fig. 215 Area 4 before dusting




Fig. 216 Area 3 after treatment with "pharmacy counter"

Fig. 217 Area 4 after treatment





Fig. 219 PY10.25 after removing the powdered material from underneath the feet



Fig. 218 Filling the cavity and stabilising the pegs



Fig 220 After the treatment

#### Fig. 221

View on the cavity underneath the feet after removing the debris of clay. Imprints of the original positions of the poles (white lines) show that the sculpture had been shifted 3 cm to the right.



# Stabilising PY10.25 (assistance figure to the left)

The two assistance figures of the *yaowang pusa* (PY 10.24 and PY 10.25) were standing instable. A thin wire had been attached to a nail in the cloud ledge below the "doctors" in area 6 and affixed around the belt. This was suited to suppress a slight wobbling (when someone touched the figure), but the wire construction would not have prevented the figure with an estimated weight of 40 to 55 kg from tilting or falling down. It was the wish of Zhao Liang to improve the situation for reasons of safety.

In front of the feet of the sculpture, the surface of the dais had cracked. The top layer consists of a thin lime-containing and very hard plaster covered with a white wash. The plaster had been applied when the brick revetment had been built or even later. Underneath the repair plaster there is a clay plaster with traces of white paint. It could be the original surface of the dais. As the repair plaster is several millimetres thick, it had covered the lowest part of the shoes. Next to the sculpture, the clay plaster was missing. Underneath the sculpture, there was only powdered clay material without recognisable structure. When it was removed, pieces of broken adobe bricks became visible on the sides of the cavity (fig. 221). This indicates that the surface of the dais was originally covered with adobe bricks in at least two layers, but it is not clear what kind of structure is underneath these layers. There are rather large voids, thus it can be assumed that the dais was not made as a solid building of adobe bricks, but contains some kind of substructure.



From the soles of the shoes of PY10.25, two wooden poles protrude downwards for approximately 15 cm. By the removal of the powdered clay underneath the figure, it became visible that the poles ended above the solid part of the dais and thus were not fixed anymore

(fig. 222 a). This explains why the sculpture had become instable. Three additional pegs of 12 to 15 cm length were found loosely imbedded in the powdered clay material, one close to the right foot, one between the feet and a third one behind the left foot (fig. 222 a). They had obviously ended underneath the shoe soles and had probably been used as wedges to stabilise the poles. From imprints inside the hole and the fracture edge at the hem of the robe on the back of the figure, it was possible to reconstruct the original position of the sculpture: 2 to 3 cm more to the centre and slightly turned towards the yaowang pusa. With its position until September 2010, the left shoe touched the fired-brick rim of the dais (fig. 222 b).

For stabilising the sculpture, the powdered clay material was removed at first by hand, then with a vacuum-cleaner. The three pegs became completely loose during this operation. The sculpture was temporarily supported with wooden props (fig. 219). Then it was moved back to its original position. The wooden pole inside the right foot is now right next to the peg again and touches it (fig. 222 c). The two pegs underneath the left foot were reinserted and temporarily tied to the wooden pole with a string in order to fasten them in the correct position (fig. 222 d). It was difficult to correct the position of the pegs and poles because the openings into the cavity were too small to insert a hand.

Pieces of adobe bricks (original pieces from the west wall) were put into the cavity and placed as close as possible to the wooden parts in order to supply a mechanical locking (fig. 222 d). The interspaces were filled with clay suspension (HFM 8, fig. 218). After the filling had dried overnight, a second layer of adobe pieces were inserted. Because the work on-site had to be ended in a hurry on September 21, there was no time to continue the filling of the cavity at this slow pace. The hole was completely filled up to the level of the clay plaster (fig. 220). The wooden props inserted to support the sculpture were left until the clay suspension would be completely dry.

Due to this quicker procedure, the layers of the filling material could not dry in between. Therefore it has to be expected that the figure will become loose again due to the shrinkage of the material during drying. Nevertheless, the relatively solid filling of the hole provides at least some stability for the figure: Otherwise it would have fallen down to the dais as soon as one prop would have been shifted, an incident which could not be excluded as the visitors can touch the figure over the glass pane. It will probably be necessary to fill cracks or voids, caused by the shrinkage of the material, by injection.\*

<sup>\*</sup>Annotation after the work stay in 2011:

The situation around the feet was not visible because the dais behind the glass panes was covered with a thick layer of donated money. The figure is still slightly unstable, but stands stable enough to remove the temporary support props. This was done in October 2011. For a better fixation of the figure, the glass panes have to be removed again.

# ASSESSMENT OF THE CURRENT SITUATION AND SUGGESTIONS FOR THE FUTURE

### Summary

The aim of the work visit in 2010 was to investigate the southern insertion wall and to record the amount of damage. A survey gave information on deformation and other kinds of damage. As far as possible, the constructional aspects were included, too, although the building technique of the wall and of the large sculptures could not be examined comprehensively. Occurrences of damage were recorded in a mapping. The technique of modelling and painting the sculptures was only studied as a sideline. Damage to small parts and the paint layers was investigated summarily. The work on-site took four and a half weeks.

Although practical work was not part of the agenda, conservation treatment was done if it was essential: Both wall sides were dusted-off. Some fragile parts had to be stabilised. It was the wish of the Chinese side that detached fragments should be reconnected with the wall as far as their original position could be ascertained. Fragments which could not be assigned to their correct places were stored, partly after a treatment for stabilising fragile parts.

# Assessment of damage

The occurrences of damage can be divided into damage to the structural system and damage to small parts and details. Damage to the structural system endangers the stability of the wall or larger parts of its decoration. Damage to small parts and surfaces affects single elements without having any influence on the stability in general.

I. Damage to the structural system: There are slight displacements in the wooden post construction which occurred over time. They probably did not affect the stability of the clay wall. The clay wall consists of a lower part built of rammed earth and an upper part of adobe bricks. The structure inside the *yaowang pusa* and his dais is unclear. Behind the *kongqueling wang* two large pegs are visible (in the upper part of the back and between the sculpture and the lotus seat) which seem to be the main connection of the sculpture to the wall. There are two main cases of damage: the sagging of the support beams inside the mountain sceneries which on both sides protrude over the crest of the clay wall, and the tilt of the *kongqueling wang*. The deformation of the support beams resulted in the sag of the rock columns and in breaks and losses of large parts of the modelling. The rather thin support beams may be too weak to carry the weight and may have deformed over a long period, but the main cause of damage is the penetration of water. It increased the weight of the mountain area and softened up the clay layer, and maybe it caused the collapse of the canopy in September 1990, too.

The *kongqueling wang* has tilted forward and is completely separated from the wall. The gap measures 6 cm at the neck. The lotus seat is tilting together with the sculpture to which it is connected and starts to separate from the wall. The damage had already been existent in the early 1980's, for then four iron rods were inserted to stabilise the sculpture. The cracks in the new plaster layers which had been applied at that time do not seem to have widened recently. The earthquake in May 2008 did not result in noticeable damage. Nevertheless the situation appears alarmingly fragile. The effect and stability of the iron rods could not be verified.

With regard to the *yaowang pusa*, no structural problems could be observed. The dais, however, needs monitoring. The type of its substructure is unknown, and its stability is dubious underneath the two assistance figures. The wall in the niche behind the head of the *yaowang pusa* is damaged, resulting in the loss of the nimbus around his head. The damage may be related to the sagging of the mountain scenery above.

II. Damage to small parts and details: The stability of the small sculptures and of details of the modelling is endangered. On the *kongqueling wang* side, four parts came down since 2001;

one detached sculpture and a cloud had to be taken down for reasons of safeguarding. The comparison to a photograph taken in 1983 proves that the big losses of the feather nimbus had already happened in 1983, but smaller elements were damaged afterwards, including the breaks in the fingers of the right hand of the *kongqueling wang*. Especially around the big lacuna caused by the collapse of the canopy, the wall decoration is fragile and in the process of separating from the wall. The mountain area next to the big lacuna above the head of the *kongqueling wang*, too, is instable and becomes detached from the wall. The partly preserved northern flying band (*piaodai*) is on the verge of breaking apart, and it is separating from the wooden peg which also is loose. It is necessary to monitor the situation carefully.

On the *yaowang pusa* side, the situation seems more stable. There are less loose or detached parts. Nevertheless many fragments found on the terraces, the dais and around the *yaowang pusa*, prove that the damage is progressing here as well.

Breaks, detached parts and losses are caused by the decrease and loss of adhesion, but to a certain degree also by persons moving close to the wall (bent and broken-off elements, scratches, and detached elements deposited on wrong places). On the *kongqueling wang* side, almost all the heads (23 heads in total) of the smaller sculptures are missing up to a height of 230 cm. It can be assumed that they had been stolen before the protective railing was installed. The parts of the wall which can be reached by visitors show the traces of extensive touching like one sculpture which is polished glossy from being "stroked". Visitors touching the sculpture have been observed until this day.

III. Condition of the paint layer: The paint layers show damage caused by water running down, flaking off of leaf-gilded areas, reduced layers from dusting or wiping-off, and partly they are darkened from soot. There are many spots of clay and red paint coming from the clay suspensions used during the renovation in 1981-85 and from repeated repainting of beams and rafters, executed rather carelessly.

All surfaces were covered in a thick layer of dust. In addition to the accumulations of airborne particles and residues from the renovation in 1981-85, countless coins and bills were found. The habit of throwing coins and bills at the sculptures is still continuing although offertory boxes have been placed in front of each sculpture.

IV. Detached fragments: Many fragments were found on or near the walls. Some of them fell down to the place where they were found, but at least half of the fragments belong to areas far away or even to other walls. They were obviously picked up and stored by laying or hanging them somewhere. This means that it is not helpful to leave detached fragments lying around where they just get dirty, can come down or be stolen.

# **Treatments**

Systematic conservation work was not on the programme in 2010, but a number of treatments were carried out nevertheless. Before the survey could be started, both sides of the wall were dusted off. The result was that thick accumulations of dirt were cleared away. Adhering clay or dust, however, were not removed.

The position of some fragments found on or next to the southern insertion wall could be located. They were re-attached to the wall. The work could not be finished due to lack of time. Most of the smaller fragments could not be assigned to a position and were stored in eleven cardboard boxes.

The stabilisation of the assistance figure PY 10.25 (figure to the left of the *yaowang pusa*) was finished under pressure of time and thus probably was not (completely) successful.

166 fragments of the canopy of the *kongqueling wang* were discovered in two cardboard boxes in the south annex building. They were dusted off roughly, examined, and stored in 20 stable cardboard boxes. Broken and structurally weakened parts were stabilised using clay suspension.

A list with the description of all the findings, including photographs and numbering according to the boxes, was prepared. There are 46 cardboard boxes filled with fragments meanwhile. A stable shelf was built to store them in the south annex. The shelf is made of metal and enclosed in a dust-proof textile cover. The costs were borne by the German side of the project.

# Suggestions for the future

# I. Urgent steps of work

The most important point is the stabilisation of the *kongqueling wang*. A plan for the work should be developed as soon as possible. The distribution of weights and forces should be discussed with an architectural historian and a stress analyst (structural engineer).

The area above the *kongqueling wang* should be conserved as soon as possible because fragments come down repeatedly and several parts are loose. A comprehensive conservation is necessary at the fragile mountain area left of the big loss above the head of the *kongqueling wang*. To prevent further losses and keep endangered elements in place, two parts were secured with strings (lady with infant PK 9.8 and *piaodai*) which must not be removed. This applies all the more to the *piaodai* as it is so fragile that it can detach and fall down at any time. Many small elements, especially protruding parts, have broken into pieces and should be stabilised before further losses occur.

# II. Further suggestions

The mountain scenery above the *yaowang pusa* seems to be stable at present. The stabilisation was done in 1981-85 mainly by the insertion of an additional beam which is thicker than the original poles (diameter about 20 cm) and to which the relief was attached with numerous wires. The stability of this solution should be checked. The mountains that had been remodelled rather roughly and shapeless in 1981-85, are aesthetically disturbing and could be improved by smoothing the surfaces; maybe they should partly be remodelled.

In principle, the sagged central part of the mountain area above the *yaowang pusa* can be lifted back to its original height. This would offer the opportunity to readjust the compressed and displaced rock columns. But an intervention of that kind would also imply a new and improved fixation of the rock columns and requires well-considered planning.

All the surfaces have to be dusted again. Afterwards further cleaning is possible, which is a necessary precondition for the consolidation of the paint layers. It would be reasonable to clean the adjacent wall sections as well, i.e. the south wall (next to the *kongqueling wang*) and the part of the southern gable wall next to the *yaowang pusa*, because this is the only way to avoid an immediate resettlement of dust already during the work. The splashes of clay suspension, mortars and paint should be removed as far as possible. Tests for removing the soot should be done.

The fragments gathered from various places should be examined with the aim of finding their original position. This work will be rather time-consuming. As it includes trying out if a part fits, elements which are too fragile to handle them have to be stabilised in advance.

The canopy can be reassembled as its main elements are preserved. Some structural supports have to be inserted to guarantee the stability (e.g. a stabilisation of the broken bamboo ring and a new connection of the canopy with the wall). Before reassembling the fragments the exact width of the canopy has to be defined. The bamboo core of the ring has relaxed (and deformed), so the original shape and width are not clear. The first step should be to search for the position of the two large clouds. Before the clouds can be handled, they have to be assembled, and probably they need an additional stabilisation. When the correct location of the large clouds will have been discovered, the position and size of the canopy can probably

be determined, because the remaining lacuna should correspond rather exactly to the dimensions of the canopy.

For the narrow passage way between the insertion wall and the middle wall, a new protective barrier could be designed. The existing solution, i.e. glass panes on the *yaowang pusa* side, is aesthetically not satisfying and constantly encourages visitors to throw money behind the glass. On the *kongqueling wang* side, visitors still reach out their hands through the bars of the metal railing to touch reliefs and sculptures within range. Besides built-in solutions, a better control by a temple employee would be desirable because mostly visitors wander around in the hall unguarded.

The reduction of dust entry and accumulation is a problem which concerns the complete hall. To improve the situation, all the surfaces, including the wooden construction, could be cleaned with paint brushes and vacuum cleaner. A small improvement could be attained by closing the gaps at the doors and below the rafters in order to reduce the air draught. A considerable reduction of new dust coming in through the opened doors and on shoes and clothes of visitors, however, can only be achieved with further-reaching changes of the entrance situation.

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# Work visit in the Shuilu'an, August 5 to Oct. 6, 2010

Day-by-day record of the work process

#### **Participants**

C. Blaensdorf, TUM, Aug. 5 to Oct. 6, 2010 Sina Setzer, Milena Huber, Students at the TUM, Aug. 20 to Sept. 25, 2010 Kao Chingmei, student at the Tainan University of Arts, Taiwan, Aug. 20 to Sept. 28, 2010 Ji Juan, Dong Xiaojuan, Shaanxi Institute for Conservation

#### **Preparation work**

#### Thu, Aug. 5

Preparation of room 406 in the Shaanxi Institute for Conservation to work there. Cleaning all tables and floors.

#### Fri, Aug. 6

Welcome by Mrs. Yang and discussion with Mr. Bai Chongbin who just returned from a trip in Tibet where he spent ten days in Guge together with "Bei Qi" (Balz Baechi). Mr. Bai promises to support the preparations of the work in Shuilu'an.

C. Blaensdorf asks for the data of the digital documentation made by H. Wallach from the Northwestern University (USA) in 2005 as a base of the documentation and writes to H. Wallach. According to Qi Yang the Chinese side not get the data, but photographed the pictures from the computer display for printing the book (sounds strange). Mr. Bai suggests photographing the pages from the book. C. Blaensdorf does not agree because the quality will be too low.

Yan Min finds the architecture drawings of the Shuilu hall from 1993. The drawings only exist as very dark blue prints, bound into a book, so they can neither be unfolded completely nor copied (besides this problem, there is no copy machine in the Center). C. Blaensdorf transfers the measured dimensions into another ground plan which is not in scale and prepares a new drawing.

#### Mon, Aug. 9

Shaanxi Institute for Conservation: C. Blaensdorf prepares information in English for the Chinese colleagues, including a table with the results of the pigment analyses of the samples from Shuilu'an.

#### Tue, Aug. 10

Shaanxi Institute for Conservation: C. Blaensdorf prepares ground plans and side views of the southern insertion walls and calculates the dimensions on the base of the architects' plans from 1993. H. Wallach has answered the email, but without any information regarding the digital photographs from Shuilu'an.

#### Wed, Aug. 11

Participants: Mrs. Liu Linxi, Ms. Gao Yan, Mr. Liu Dongbo, C. Blaensdorf. Working time: 11:00-12:30; 13:00-14:45

Shuilu'an: Measuring of *kongqueling wang* wall, using a folding ruler and a wooden stick of 2.50 m length. On the floor, pieces of painted background are found which came down from the fragmented northern *piaodai* of the canopy. The fragments are stored in a box.

After lunch, height and distance to walls and bars are measured on the *yaowang pusa* side for the calculation of the scaffolding.

Liu Dongbo photographs the 1000-armed guanyin in three sections (i.e. levels of height).

# Thu, Aug. 12

Shaanxi Institute for Conservation: C. Blaensdorf prepares drawings of southern insertion wall based on the architects' drawings from 1993 and the measurements taken on the day before. There are considerable differences between the new measurements and the drawings from 1993 (up to 60 cm). Gao Yan and Liu Dongbo leave abound noon. They go to Beijing for two months for a class on textile conservation. Mrs. Liu who is the contact person for Shuilu'an is sick. C. Blaensdorf corrects the view of the thousand-armed *guanyin* made by Liu Dongbo in the computer. In the evening it gets too hot to work in the Center.

# Fri, Aug. 13

Shaanxi Institute for Conservation: There is nobody in the Conservation Department, so any further preparation for the work on-site has to be postponed. C. Blaensdorf prepares preliminary drawings of the *kongqueling wang* wall and the *yaowang pusa* wall. Still very hot.

# Mon, Aug. 16

C. Blaensdorf: Calculation of the scaffolding using the drawings based on the measurements of Wed, Aug. 11.

At 16:00 arrival of Liu Ming and Xu Yi from the university of Heidelberg and discussion of their work programme with Qi Yang. The two ladies will accompany the restorers to Shuilu'an for some days and then travel to Shanxi.

# Tue, Aug. 17

C. Blaensdorf: Planning of scaffolding finished after discussion with Yan Min. Yan Min copies photographs by Zhen Gang of the walls of the *yaowang pusa*, *dizang pusa* and *kongqueling wang* for C. Blaensdorf as base for the mapping.

### Thu, Aug. 19

Evening: Arrival of Sina Setzer and Milena Huber from TUM and of Kao Chingmei from Tainan University of Arts in Xi'an, Taiwan. The three students will participate in the work until September 25.

#### Fri, Aug. 20

C. Blaensdorf, Yan Min, S. Setzer, M. Huber and Kao Chingmei visit the Shuilu'an. Discussion with Zhao Liang and Mr. Ma Xifeng, provider of the scaffold, about the dimensions of the scaffolding and the number of required bars.

# Work on-site, week 1

#### Mon, Aug. 23

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei, Liu Ming, Xu Yi. Working time 11:30 - 17:30. Heavy rain. As exemption drive on the highway to Shuilu'an to save time (duration 45 minutes). The other days the route goes over the normal road (duration 90 minutes).

Photographing the *yaowang pusa* and the *kongqueling wang* wall. The *yaowang pusa* can be photographed in one picture, but the *kongqueling wang* has to be photographed in three levels which are stitched together later on.

Mr. Ma and another farmer set up the scaffold. Zhao Liang is organizing and helping. The glass protection in front of the *yaowang pusa* is removed. Money and dirt on the dais behind the glass are removed.

At the west wall the wooden prop supporting figure W4.30 has been bent and is now pointing downwards supporting the figure no more. The figure is loose and tilting forward, but not severely endangered to fall down. The prop is removed. S. Setzer and M. Huber measure the heights of tiers and windows at the west wall.

# Tue, Aug. 24

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei, Liu Ming, Xu Yi. Working time 11:15 – 17:30

The scaffold is finished, except for some additional bars allowing to climbing the highest levels. Wooden planks are delivered for working on the scaffolding. The scaffolding is very stable and comfortable.

#### Yaowang pusa

Photographing the wall in sections and numbering the sections in areas.

Preliminary rough cleaning of mountains, area 1 and 2: The thickest layers of dust are removed by brush and accumulations of dirt are removed by hand or using spoons. The dirt accumulations contain numerous bills and coins, but also fragments from the reliefs. Detached figurines and fragments are taken down, photographed, numbered and stored in cardboard boxes (see list of findings, boxes 14, 15, 16).

The "pharmacy counter" situated in the center of the pavilion of area 4 is found to belong in the center of the pavilion of area 3. This proves that loose fragments at least partly are not stored close to their original position. The center of area 4 had contained a bench with two (sitting?) figures which are lost (or not identified yet).

#### Kongqueling wang

The wall is divided in sections according to the tiers of the figures (tier 1 to 6). Photographing the topmost section. Preliminary rough cleaning with paint brushes and by hand. Detached fragments, bills and coins are removed from the wall. The fragments are photographed, numbered and stored in cardboard boxes (see list of findings, boxes 20, 21, 22).

In principle, loose or detached parts which clearly can be assigned to a position will be stabilised or reattached in place. The fixation can be temporary, but has to be stable enough to prevent the loss of a broken piece in near future (i.e. the coming years).

#### Wed, Aug. 25

Participants: Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei, Liu Ming, Xu Yi. Working time: 10:30 – 17:30

#### Yaowang pusa

Finishing photographing the situation before dusting off. Preliminary dusting with paint brushes. Removing thick layers of dirt. Loose original fragments collected from dirt. Many fragments are found behind the assistance figure to the right (PY 10.24), and behind the feet of the first *jingang* of the south wall next to the *yaowang pusa*. Collected fragments are photographed, catalogued and stored in cardboard boxes.

The assistance figure to the left (PY 10.25) is loosened. Rubble and sand removed from the hole underneath the figure, as well as one original peg which is holding nothing. Underneath the visible gypsum (?) plaster on the surface of the dais, the original clay surface with traces of white paint of priming is preserved. - Some broken fragments are re-assembled by re-attaching broken parts with clay suspension (see list of glued fragments).

#### Kongqueling wang

Cleaning with paint brushes and vacuum cleaner started, beginning from top.

# Thu, Aug. 26

Participants: Mrs. Dang Xiaojuan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei, Liu Ming, Xu Yi. Working time: 10:15 - ca. 18:00

#### Yaowang pusa

S. Setzer starts to draw the construction of the crown. Photographing collected fragments finished.

#### Kongqueling wang

Cleaning with paint brushes and vacuum cleaner.

#### Canopy of Kongqueling wang

Afternoon: From the south annex building two cardboard boxes are brought to the courtyard. According to Zhao Liang the boxes were already stored in the annex when he started to work at the Shuilu'an in 1991. The cardboard is humid and decayed; the fragments are covered with dust and dirt and broken due to their own weight. The fragments in the boxes proof to come from the *kongqueling wang*. From about 200 fragments several complexes can be reconstructed: the canopy, ten clouds of different size, and rocks from the mountain background. The fragments are sorted into groups, photographed and packed into boxes (15 boxes without canopy and one large part of the rocks).

#### Fri, Aug. 27

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei, Liu Ming, Xu Yi. Working time: 10:20-17:00

#### Yaowang pusa

Cleaning with paint brushes and vacuum cleaner started from top downwards.

#### Kongqueling wang

Re-attaching some small broken parts with clay suspension (see list of glued and re-attached parts). Photographing and cataloguing peacock feathers found behind the feather halo (behind the right shoulder of the *kongqueling wang*)

#### Fragments of canopy and findings

Stabilising some of the broken parts of the canopy and some other fragments found on the wall of the *yaowang pusa* (see list of glued and re-attached parts).

Discussion with Mrs. Dang, Mrs. Ji and Zhao Liang about a shelf for the about 20 boxes with fragments of canopy and architecture which have to be stored in the south annex building. A place is selected on the middle of the gable wall of the hall (inner wall). The dimensions are calculated with a width of 210 cm and at least 6 boards, allowing the storage of 36 boxes. The rack will be covered with fabric to keep boxes and fragments clean of dust.

Dimensions of the existing cardboard boxes:

W	L	Н	
2007	33	49	23
2010	30	42	30

# Work on-site, week 2

#### Mon, Aug. 30

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time 11:00 – 18:00

While installing the extension wires, it becomes obvious that the cable reel is conducting electricity to the metal reel. Nevertheless it is taken into use. During the discussion about the work, the cable reel touches the scaffold, conducting the electric current into the scaffold bars. Mrs. Dang touches the scaffold and receives an electric shock. She returns home.

#### Yaowang pusa

Continuation of vacuum cleaning

#### Fragments of canopy and findings

Continuation of gluing broken fragments from the canopy of the *kongqueling wang* and from the *yaowang pusa* terraces.

Discussion with Zhao Liang on the value of the photographs taken in the 1980's after the renovation and published in the small booklet on the Shuilu'an in 1983. The photograph of the 1000-armed *guanyin* shows that five small sculptures from the pavilion and mountain scenes have disappeared since that time. The photograph of the *guanyin* on the middle wall clearly shows the large damaged area on the belly.

The photograph of the *konqueling wang* is a close-up showing only the sculpture itself, not the surrounding wall or the canopy. There is no photograph of the *yaowang pusa* in the booklet.

Zhao Liang promises to try to contact the photographer and ask for the negatives of the black-andwhite photographs.

The craftsmen for building the shelf are announced for 2 pm, but they do not come.

#### Tue, Aug. 31

Participants: Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time 10:15 – 18:00

#### Yaowang pusa

Vacuum cleaning finished. Some more small fragments are found behind the pedestal.

#### Kongqueling wang

Photographing all sculptures one by one, with numbers, and the kongqueling wang in details.

#### Fragments of canopy and findings

Continuation of gluing broken fragments from the canopy of the kongqueling wang.

#### Wed, Sep. 1

Participants: Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei, Liu Ming, Xu Yi. Working time: 9:30 – ca. 19:50

Day of work in the Center for Restoration: Preparation for detail drawings of the areas 1 to 4 of the *yaowang pusa* and new drawing of the *kongqueling wang*. At lunch invitation of the guests from Heidelberg and Munich by Director Zhang, Vice-director Zhang Jianwu and Vice-director Mrs. Zhao. Qi Yang is also present. It is also the fare-well lunch for Liu Ming and Xu Yi who are departing.

In the afternoon Liu Ming and Xu Yi can go to visit the Qin terracotta army. Qi Yang arranges for S. Setzer and M. Huber to join them. Kao Chingmei and C. Blaensdorf finish the drawings. Though the drawings of the single areas of the *yaowang pusa* side are much more detailed than the preceding overall drawings made before, there are still inaccuracies in the details because the printed-out photographs used for making the drawings are neither detailed enough nor sufficiently brought into focus. (For the final version of the documentation better drawings are necessary).

# Thu, Sep. 2

Participants: Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time: 10:30 - ca. 18:00

*Yaowang pusa* Photographing all areas and the *yaowang pusa* itself in detail (Ji Juan).

*Survey of the wall* Installation of the strings for measuring the *yaowang pusa* wall started.

*Fragments of canopy and findings* Continuation of consolidation and gluing.

# Fri, Sep. 3

Participants: Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time: 10:50-18:00

*Fragments of canopy and findings* Continuation of consolidation and gluing.

*Yaowang pusa* Failed photographs from the day before are repeated.

Survey of the wall

Control measurement to assure if the floor is straight, with tube balance. Setting up the horizontal string on the *kongqueling wang* wall continued.

# Work on-site, week 3

# Mon, Sep. 6

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf. Working time 11:00 – 17:45 S. Setzer and M. Huber are sick and stay in the hotel. Heavy rain.

#### Kongqueling wang

Morning: Packing the fragments of the canopy and other fragments which have been glued into the boxes. Afternoon: Measurements for the survey started.

# Tue, Sep. 7

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf, Kao Chingmei. S. Setzer and M. Huber are still sick and stay in the hotel. Working time 10:30 - 18:00

#### Yaowang pusa

Green beam in architecture of area 4 assembled and glued together. A bamboo stick behind the beam is stabilizing the fragile broken part.

#### Kongqueling wang

Measuring the wall continued: Lower part and top part.. Setting in a perpendicular in front of the *kongqueling wang* to measure the sculpture itself. The plumb bob is pointing to the neck of the peacock. An installation further away from the sculpture is prevented by the planks of the scaffold.

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# Wed, Sep. 8

Participants: Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time: 10:30 - 17:30

#### Yaowang pusa

The measures are taken at 10 cm distance for vertical sections along the perpendiculars. Sketch of top view of the four terraces including missing parts and holes from lost bamboo or wooden sticks to insert a figure or another element.

#### Kongqueling wang

Installation of another perpendicular in front of the *kongqueling wang* to measure the sculpture itself. The two wooden planks of the scaffold close to the wall are removed and the perpendicular is installed in front of the beak of the bird. The measures for a vertical section at the northern perpendicular are taken with steps of 10 cm.

#### Fragments

Lady box 6-1

A small sculpture was found in 2007, wedged in between two sculptures of the south wall (tier 6, between S 6.3 and S 6.4, see *Images of Shuilu'an* 2009, p. 45). It shows a lady without head holding an infant on her left arm, and measures 20 cm in height. In 2001 she still had a head (maybe a completion made in 1981-85) which is missing today. She was stored as finding with the number Box 6-1. The photograph of the *kongqueling wang* taken by S. Scheder in 2001, allows indentifying the figure as PK 9.8, on the left part of the mountain scenery above the head of the *kongqueling wang*. The sculpture can be inserted to the mountain ridge, but the mountain is broken and unstable.

A stick remembering a flower (maybe originally carrying a cloud on the tip) is found on the beam next to the mountain peak above PK 9.8. The flower is detached and at risk of falling down. It is taken down and stored temporarily.

#### Thu, Sep. 9

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time: 10:40 - ca. 17:45

#### Yaowang pusa

The measures are taken at 10 cm distance for horizontal sections along the two strings.

#### Kongqueling wang

Measuring for the survey finished, including two horizontal sections, two vertical wall sections and one vertical section through the sculpture.

#### Yaowang pusa

The measures are taken at 10 cm distance for horizontal sections along the two strings.

#### Fragments of canopy and findings

The order to build a shelf for the boxes is given to a craftsman.

#### Fri, Sep. 10

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time: 10:20-17:50

#### Yaowang pusa

Measuring of the front view of the wall started.

#### Survey

A control of the distances shows that the horizontal strings on the two sides are not perfectly parallel. The distance is 113.5 cm at the southern perpendicular and 109 cm at the northern perpendicular.

# Work on-site, week 4

# Mon, Sep. 13 - Center

Participants: C. Blaensdorf, Kao Chingmei, S. Setzer, M. Huber. Working time 9:00 - 18:00The car has to be repaired, so there is no possibility to go to Shuilu'an. The team works in the Shaanxi Institute for Conservation instead.

Survey

Dawing the horizontal and vertical sections in the scale of 1:10. Five section views finished, four others started.

# Tue, Sep. 14

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf, Kao Chingmei, S. Setzer, M. Huber. Working time 10:50 - 17:20

# Yaowang pusa

Survey of the wall; taking the measurements.

*Kongqueling wang* Control measurements for survey.

# Wed, Sep. 15

Participants: Mrs. Ji Juan, S. Setzer, M. Huber, Kao Chingmei. Working time: 10:10 - 17:50 C. Blaensdorf stays in Xi'an to apply for the extension of her visa with the help of Yan Min.

*Yaowang pusa* Survey of the wall; taking the measurements.

*Kongqueling wang* Mapping of condition and state of damage.

# Fragments of canopy and findings

In the south annex the craftsman sets up the shelf. - Labelling boxes for storage in the shelf started.

Survey

After returning from the visa application C. Blaensdorf finishes the drawing of the wall sections in the Shaanxi Institute for Conservation.

# Thu, Sep. 16

Participants: Ji Juan, C. Blaensdorf, M. Huber, S. Setzer, Kao Chingmei. Working time: 10:30 - ca. 18:15

*Yaowang pusa* Continuation of the survey.

Kongqueling wang

Control of mapping. Taking notes on wall construction and damage.

# Fragments of canopy and findings

The shelf is finished. It is made of metal, the surfaces are painted. The shelf is covered with a textile which can be opened at the front with a zipper. The boxes of the canopy are photographed and stored into the shelf (boxes 31 to 50). In the upper part, the boxes from 2007 and 2009 are stored (boxes 1-14).

The wardrobes are checked for their contents and possible space to store KB5, the large fragment with the bamboo semicircle of the canopy.

# Fri, Sep. 17 - Center

Participants: C. Blaensdorf, Kao Chingmei, S. Setzer, M. Huber. Working time 9:00 – 19:45 There is no driver, so the team stays in the Shaanxi Institute for Conservation.

#### Survey

Drawings of the vertical surveys finished. Drawing of a horizontal section through the wall started.

#### Mapping

Clean drawing of the mapping. Text about wall construction and damage started.

### Sat, Sep. 18

Participants: C. Blaensdorf, Kao Chingmei, S. Setzer, M. Huber.

The Shaanxi Institute for Conservation has offered a car and free entrance for a visiting day to the German team. Visit of HanYangling and Xianyang Museum. (The visit in Maoling is cancelled because of lack of time).

#### Work on-site, week 5

#### Sun, Sep. 19

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time: 10:15-18:15

#### Yaowang pusa

Mapping of damage to the wall. Cleaning the part towards the south gable wall again with vacuum cleaner.

#### PY10.25 (assistance figure to the left)

The loose clay powder is removed from the hole underneath the feet.

Underneath the new lime-plaster of the surface of the dais, there is white-wash on top of a clay plaster which could be the original surface. The hole underneath the sculpture is rather big and full of powdered clay. It remains unclear what the interior of the dais is made of. There are no clearly recognizable parts of adobe bricks. Underneath the hole, there seems to be a larger void which cannot be explored.

There are two wooden poles which are part of the figure's inner structure. When the figure was made, these were driven into the dais. There are additional wooden pegs, about 12 to 15 cm long, ending underneath the feet (two at the left foot, one at the right foot). These were probably used as wedges to stabilise the wooden poles.

At present, the pegs are loose and the wooden sticks end in the powdered clay. Peg-shaped holes in the dais prove that the figure had slightly been shifted und displaced compared to the original position. The wooden sticks now end above the more solid part of the dais. The sculpture has no support anymore. Temporarily it is supported with wooden props underneath the arms, the book and the hem of the robe on the backside.

#### Kongqueling wang

Investigation of the situation behind the figure of the *kongqueling wang*: The plaster filling between figure and wall from 1981-85 is removed partially. The area between lotus seat and elbow is opened. A number of feathers from 1981-85 is removed for this purpose. Behind the plaster filling, the original surface of the figure and the wall is discovered. The wall still shows the marks of the lost peacock feathers. A part of one original feather is found. Behind the filling there are bills and coins from the money people are throwing at the figures. It causes some astonishment that the money shows dates from 1990 and later, when the renovation of the temple was already finished. There are small holes at the neck of the *kongqueling wang*, and obviously the money fell through these holes and behind the filling of 1981 (although this requires throwing). Behind the *kongqueling wang* there is a big hole. A big wooden peg is visible behind the lotus pedestal, pointing downward inside the wall. The hole above the peg is measured to be at least 22 cm deep. There is a deep recession in the wall in the back of the *kongqueling wang*. Probably it was made to improve the connection between sculpture and wall.

The respective part on the back of the *kongqueling wang* consists of mud-straw and thus definitely is not part of the wall. It is not clear if the wall behind the *kongqueling wang* is made of rammed earth or adobe bricks: A straight line is visible in the upper part of the recession, but there are no clearly visible joints as in the upper part of the wall.

Cleaning the mountains on the left side again, where the sculpture PK9.8 and the "flower"-shaped element have to be attached.

On the way back to Xi'an it becomes clear that the car has to be repaired and that for the next day there will be only a small car for four persons. The Chinese colleagues suggest that one of the Germans should stay in Xi'an. To bring all the participants to the Shuilu'an for the last days, another car is rented for the next two days, paid by the German side (C. Blaensdorf).

# Mon, Sep. 20

Participants: Mrs. Dang Xiaojuan, Mrs. Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time 11:00 - 12:30

The traffic situation in Xi'an is terrible. It takes very long to reach the south border of the city.

#### Yaowang pusa

Finishing the mapping.

#### PY10.25 (assistance figure to the left)

The position of the figure is readjusted taking into account the holes of pegs, visible underneath the feet, and the connection between the hem of the robe and the original (or older) surface of the dais on the back of the figure. The figure is much too heavy to be lifted by two persons, but it can be turned and moved slightly. After adjusting the position, the hole underneath the feet is cleaned again. The pegs are tied to the wooden sticks in the original position. The space underneath the tips of wooden sticks and pegs is filled using a mixture of black earth, micro-balloons and Tylose MH300 (HFM 8). According to the original recipe, the mixture is much too viscous to inject it, so it has to be diluted with water.

#### Kongqueling wang

Investigation of the wall structure and the damage behind the figure of the *kongqueling wang* continued. Drawing and measuring the constructive parts on the top of the wall.





Wuzhensi

Clay figure in the courtyard

#### Wuzhensi

During lunch break, the power fails and does not return in the next hour. The work has to be stopped after the started filling layer underneath the feet of PY10.25 has been finished in complete darkness using torchlight.

As the power does not come back until 2 pm, one car returns to Xi'an with Mrs. Dang and Ji Juan. The German team starts a tour to the Wuzhensi. The sky is blue and the sun is shining, a perfect afternoon for the mountains. At the Wuzhensi there is a couple who just came to fetch the monk whom they invited for some days. The man shows them the temple and the newly renovated hall (in 2007 it was a hay barn), now harbouring some ugly new sculptures and scrolls with calligraphy, ordered and paid by that man. We have little time as the monk is about to leave, but we can see a remaining fragment of a large clay sculpture standing in the courtyard (and falling apart), which according to the man is from the Tang Dynasty. They do not have money for the restoration, so they leave it in the courtyard, not even inside.

#### Tue, Sep. 21

Participants: Ji Juan, C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time 10:30 - 20:00

At 16:00 Yan Min calls to tell that C. Blaensdorf's visa has not been extended yet, and therefore they cannot go to Ziyang on the  $26^{th}$  as planned before. He also tells that there is a new regulation that from the following day on, no foreigners are allowed to go the Shuilu'an.

The work planned for one or two more days cannot be finished within few hours. The driver insists that he has to go back not too late, because he has to start for Shanxi the following morning at 8 am. In this situation, it is only possible to clean up and store the fragments. In the last hour (18:30 to 19:45), the hole around the feet of PY 10.25 is filled and a few elements are re-attached to the wall.

#### Yaowang pusa

- Control of the mapping of damage (superficially)

- PY10.25: The hole at his feet is filled with parts of broken adobe bricks and shapeless completions from 1981-85 found on the top of the wall. These pieces are surrounded by layers of HFM 8. Regarding the usual standards, the hole is filled too quickly (within only two days) and without proper drying-time between the layers of filling material. Regarding the circumstances, it nevertheless seems better to fill the hole.

- The mule (box 15-1) is identified to belong to the southern gable wall, where it was walking up a staircase-shaped path, a man with a whip (the muleteer) urging it to go on. (The hole from the peg was used to attach the string of the upper horizontal string). Legs stabilized, head glued to neck.

- "Pharmacy counter" PY10.15: In the morning, after a support for the counter has been adjusted, a fragment found on area 4, too (box 14-4), is discovered to be the lower part of the "pharmacist" and thus the stand of the counter. It can perfectly be attached to the counter, but surprisingly it is too short to function as base. Fitting in the counter is difficult because of the broken leg, the broken "balance" and right hand of the man. A support is made of small blocks of completion material from 1981-85. After one try-out, the counter is re-installed at its original position. Originally the counter was not connected to the wall, but considering its state of damage, it is now attached to the wall using HFM 8 and black earth with Tylose MH 300. The support is glued to the terrace floor and to PY10.15. The hand of the man and the "balance" are glued to their correct positions once more after re-attaching the counter to area 3.

- The "fish lady" (box 18-1) is re-attached at her original position in the center of the pond of area 2. She is supported with a wooden prop for drying.

#### Kongqueling wang

- In the upper left (northern) part of the mountains the female figure with child (P 9.8), the "flower"-shaped element and a rounded mountain rock are re-attached and secured with strings. The ones around PK9.8 must not be removed because the mountain behind is broken and not attached to the wall anymore. Before the strings can be taken off, the wall and the connection of the mountains to the wall have to be consolidated on this whole side of the mountain area. The strings around the "flower" and the mountain head can be removed after the gluing material will have dried (HFM 8 and black earth with Tylose).

- Finding box 21-9 can be identified as the right arm of PK9.49 and is reconnected to the sculpture.

# Week 5 - Work in the Shaanxi Institute for Conservation

# Wed, Sep. 22 – Moon festival

Participants: C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time 10:30 - 20:00

### Survey

Drawing of the yaowang pusa frontal view started. Drawing a horizontal section through both walls.

# Mapping

Clean version of the mapping of the *yaowang pusa* started.

# Thu, Sep. 23

Participants: C. Blaensdorf, S. Setzer, M. Huber, Kao Chingmei. Working time 10:00 – 20:00

Survey

Drawing of the *yaowang pusa* frontal view finished. Attempt to draw the brick pedestal (some measuring problems).

Mapping

Clean version of the mapping of the yaowang pusa finished.

# Fri, Sep. 24

Free day. In the evening farewell invitation by the Bureau of cultural relics (*wenwuju*) and the Shaanxi Institute for Conservation.

# Sat, Sep. 25

Participants: C. Blaensdorf, Kao Chingmei. Working time: 10:00-21:45 S. Setzer and M. Huber leave in the morning to return to Germany via Beijing. C. Blaensdorf and Kao Chingmei continue the drawings of the survey: frontal view of *kongqueling wang* wall started.

# Sun, Sep. 26

Participants: C. Blaensdorf, Kao Chingmei. Working time: 13:30-19:00 C. Blaensdorf and Kao Chingmei continue the drawings of the survey.

# Week 6 - Work in the Shaanxi Institute for Conservation

### Mon, Sep. 27

Participants: C. Blaensdorf, Kao Chingmei. Working time (C. Blaensdorf): 15:00-21:00

10:00: Yan Min has arranged a possibility to visit the wall painting storage room at the Shaanxi History Museum (*lishi bowuguan*). Ji Juan, Kao Chingmei and C. Blaensdorf are received by Mrs. Wen Jun who takes them to the wall painting storage room. Here they are joined by Liu Peng, Vice-director of the Cultural Heritage Promotion Center of the museum.

They show them a stone coffin which was stolen in 2004 and now returned after being traced in the United States. It comes from the tomb of the wife (or consort?) of a Tang dynasty emperor from the middle of the 8<sup>th</sup> century (Yang Guifei, consort of Xuanzong?). The stone coffin has the shape of a house and is made of lime stone and partially painted. The depictions are exquisite, with scenes incised in fine lines like drawings, showing landscapes, mandarin ducks, bamboo etc. on the side and back and heavenly beings in whirls of clouds and flowers on the front. Four small scenes on the lowest part of the front show Western influence; they seem to resemble Greek or Greco-Buddhist depiction.

The storage room is still the old storage room, but air-conditioned and cleaned up. The group has a lot of time to see the wall paintings in detail and ask questions. Afterwards they can visit the small restoration workshop and talk with the restorer, Mr. Lu. He has to treat all kind of objects. At present, he is working on a detached wall painting and on a large Tang Dynasty terracotta sculpture which had been assembled and completed by the archaeologists and which he has to take apart now because neither gluing nor filling are fitting. The workshop is surprisingly small and basically equipped for such a big museum. The part of the building which once had been used by the Shaanxi Institute for Conservation is still under construction and Wen Jun tells us that the western wing will contain the new workshops.

Afterwards the group is invited for lunch by members of the administration department of the museum, presenting themselves as siblings (two brothers and a sister).

15:00 in Center: Discussion with Mr. Bai Chongbin about the possibility to go to Ziyang. Zhang Feng will try to buy train tickets now and is ready to accompany C. Blaensdorf, but because of the National Day vacation the lines in front of the ticket office are endless.

#### Survey

Drawing the frontal view of the kongqueling wang wall continued.

#### Tue, Sep. 28

Participants: C. Blaensdorf. Working time: 12:00-20:00. Kao Chingmei leaves at noon to return to Taiwan.

Discussion with Mr. Bai Chongbin about the possibility to go to Ziyang. In the afternoon it becomes obvious that there is no possibility.

#### Survey

Drawing the frontal view of the kongqueling wang wall continued.

#### Wed, Sep. 29

Participants: C. Blaensdorf. Working time 10:30 – 20:00

Cleaning the room for the visit of a ministry delegation the next day (which is canceled the next morning). Re-organising all material in the plastic boxes and new list for contents.

#### Survey

Attempt to finish the drawing of the kongqueling wang wall, frontal view.

# Thu, Sep. 30

Participants: C. Blaensdorf. Working time 10:30 - 20:00

At noon invitation for a farewell lunch for C. Blaensdorf with Bai Chongbin, Mrs. Dang Xiaojuan, Ji Juan and Yan Min.

Survey

Drawing of the kongqueling wang wall, frontal view, continued.

Fri, Oct. 1

# National Day (rain)

C. Blaensdorf finishes the drawings of the kongqueling wang. List of findings continued.

Sat, Oct. 2 List of findings finished except for the last boxes. Half day free.

Sun, Oct. 3 Day-by day record finished.

Mon, Oct. 4 Free day

#### **Tue, Oct. 5** Free day

Wed, Oct. 6 6:30 C. Blaensdorf departs from the hotel to fly back to Germany.

# List of findings 2010

# **Overview on boxes**

Box 14 (2009)	West wall, section 5
Box 14 (2010)	yaowang pusa
Box 15	yaowang pusa
Box 16a and b	yaowang pusa
Box 17	yaowang pusa
Box 18	yaowang pusa
Box 20	kongqueling wang
Box 21	kongqueling wang
Box 22	kongqueling wang

# **Contents of boxes**

# Yaowang pusa

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 14 (2010)	1	yaowang pusa area 4, floor of terrace	2010- 08-24	green panel connecting the pillars, central area	pavilion architec- ture > re- attached	6 x 2	
Box 14 (2010)	2	yaowang pusa area 4, floor of terrace	2010- 08-24	torso of lady without head and feet	cannot be assigned	15 x 5	B0X /4 - 2
Box 14 (2010)	3	<i>yaowang</i> <i>pusa</i> area 4, floor of terrace	2010- 08-24	rectangular basin?	cannot be assigned	8 x 8.5 x 4	
Box 14 (2010)	4	yaowang pusa area 4, floor of terrace	2010- 08-24	lower part of lady, not painted	> re- attached with box 14-16	14.5 x 7 x 4.5	Box /4 - 4
Box 14 (2010)	5	yaowang pusa behind right shoulder of pusa, next to area 4	2010- 08-24	hairpin made of bamboo pole with gilded flower at the end	head of <i>yaowang</i> <i>pusa</i> , left side	33 x 6	DOM #-2

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 14 (2010)	6	<i>yaowang</i> <i>pusa</i> area 4, floor of terrace	2010- 08-24	left hand, white flesh tone	cannot be assigned	7.5 x 3	(
Box 14 (2010)	7	<i>yaowang</i> <i>pusa</i> area 4, floor of terrace	2010- 08-24	dark piece, from robe?	cannot be assigned	5 x 2	
Box 14 (2010)	8	<i>yaowang</i> <i>pusa</i> area 4, floor of terrace	2010- 08-24	part of decoration behind pillar of pavilion	left side of central area ?	2.5 x 3	
Box 14 (2010)	9	<i>yaowang</i> <i>pusa</i> area 4, floor of terrace	2010- 08-24	three small pieces of clay	cannot be assigned	ca. 4 long	400
Box 14 (2010)	10	<i>yaowang</i> <i>pusa</i> area 4, floor of terrace	2010- 08-24	three pieces of feelers one thin curved piece	dragon next to pavilion ?	ca. 2.5 – 4 long	plist
Box 14 (2010)	11	<i>yaowang</i> <i>pusa</i> on the brick pedestal, left side	2010- 08-24	small red fragment	cannot be assigned	5.5 long	
Box 14 (2010)	12	yaowang pusa area 3, floor of terrace	2010- 08-24	small white cloud	cannot be assigned	8 x 4.5	
Box 14 (2010)	13	<i>yaowang</i> <i>pusa</i> area 3, floor of terrace	2010- 08-24	torso of person	cannot be assigned	14.5 x 7	
Box 14 (2010)	14	<i>yaowang</i> <i>pusa</i> area 3, floor of terrace	2010- 08-24	flower-shaped end	"pharmac y counter" PY 10.15, left leg	5 x 2.5	3
Box 14 (2010)	15	<i>yaowang</i> <i>pusa</i> area 3, floor of terrace	2010- 08-24	two small fragments one flower- shaped fragment	cannot be assigned	ca. 3 long	

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storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 14	16	yaowang pusa area 4, center	2010- 08-24	"pharmacy counter" with man weighing (?) with scales and red box	area 3, center, re- attached to wall		
Box 14	17	yaowang pusa, area 4, pilaster behind pillar, left side of central scene	2010- 08-24	decoration of architecture	> joined with Box 14-8 and re- attached to wall		no photograph
Box 15	1	yaowang pusa pedestal behind PY10.24	2010- 08-25	saddled horse, head unstable, long peg in the back	cannot be assigned	28 x 23 x 24	
Box 15	2	yaowang pusa pedestal behind PY10.24	2010- 08-25	fragment of a cloud	cannot be assigned	10 x 7	
Box 15	3	yaowang pusa pedestal behind PY10.24	2010- 08-25	part of eave tiles below terrace	cannot be assigned	9 x 7	
Box 15	4	yaowang pusa pedestal behind PY10.24	2010- 08-25	part of eave tiles below terrace	cannot be assigned	7 x 6	Çõ
Box 15	5	yaowang pusa pedestal behind PY10.24	2010- 08-25	part of eave tiles below terrace	cannot be assigned	6.5 x 5.5	
Box 15	6	yaowang pusa pedestal behind PY10.24	2010- 08-25	fragment of a roof	cannot be assigned	8 x 3.5	
Box 15	7	yaowang pusa pedestal behind PY10.24	2010- 08-25	fragment of a beam of pavilion	cannot be assigned	16 x 3.5	
Box 15	8	yaowang pusa pedestal behind PY10.24	2010- 08-25	?	cannot be assigned	12 x 2.5	

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 15	9	yaowang pusa pedestal behind PY10.24	2010- 08-25	fragment of a figure?	cannot be assigned	17.5 x 4	
Box 15	10	yaowang pusa pedestal behind PY10.24	2010- 08-25	fragment of long bent element (dragon moustache ?)	cannot be assigned	21 x 3	
Box 15	11	yaowang pusa pedestal behind PY10.24	2010- 08-25	fragment of bent element (dragon moustache ?)	cannot be assigned	6.5 x 2.5	
Box 15	12	yaowang pusa pedestal behind PY10.24	2010- 08-25	fragment with red paint layer	cannot be assigned	7 x 4	
Box 15	13	yaowang pusa pedestal behind PY10.24	2010- 08-25	six fragments of robes, roof etc.	cannot be assigned	3.5 x 2	
Box 16	1	yaowang pusa pedestal behind PY10.24	2010- 08-25	fragment of a rock	cannot be assigned	14 x 8 x 5	
Box 16	2	yaowang pusa pedestal behind PY10.24	2010- 08-25	fragment of a rock	cannot be assigned	6.5 x 5	
Box 16	3	yaowang pusa pedestal behind PY10.24	2010- 08-25	fragment with red paint layer	cannot be assigned	8.5 x 4.5 x 2	
Box 16	4	yaowang pusa pedestal behind PY10.24	2010- 08-25	three fragments with paint layer	cannot be assigned	5 x 2.5	216

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 16	5	yaowang pusa pedestal behind PY10.24	2010- 08-25	five fragments with paint layer	cannot be assigned	4 x 2.5	• • •
Box 16	6	yaowang pusa pedestal behind PY10.24	2010- 08-25	two fragments of clay plaster	cannot be assigned	3 x 3 x 2	• •
Box 16	7	yaowang pusa pedestal behind PY10.24	2010- 08-25	four fragments of plaster	cannot be assigned	2.5 x 2.5	- 0 -
Box 16	8	yaowang pusa pedestal behind PY10.24	2010- 08-25	three fragments of wooden part with paint layer	cannot be assigned	3 x 2 x 1.5	0000
Box 16	9	yaowang pusa pedestal behind PY10.24	2010- 08-25	three beads with paint layer	cannot be assigned	1.5 x 0.8	3 <b>3</b>
Box 16	10	yaowang pusa hole below PY10.25 (?)	2010- 08-25	<ul> <li>fragment of plaster with lime wash (maybe 1985)</li> <li>fragment with grey paint layer</li> <li>piece of wood</li> </ul>	cannot be assigned	3.7 x 1.5 x 1.2	000
Box 16	11	<i>yaowang</i> <i>pusa</i> behind right shoulder	2010- 08-25	band adornment of <i>pusa</i>	cannot be assigned	21 x 1.5 x 1	
Box 16	12	<i>yaowang pusa</i> on the lap	2010- 08-25	fragment with pointed tip and paint layer	cannot be assigned	5.5 x 1 x 1	2
Box 16b	13	<i>yaowang</i> <i>pusa</i> behind right shoulder	2010- 08-25	wall plaster with paint layer	cannot be assigned	6 x 3 x 1.5	

# Southern insertion wall

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 16b	14	yaowang pusa on the crown	2010- 08-25	wire with rosette ornament, beads and pendant (pink, not gilded)	from canopy of <i>kongque</i> <i>ling</i> <i>wang</i> ? cannot be assigned	24.5 x 4 x 1	Bartland
Box 16b	15	yaowang pusa area 1, hanging on balustrade of the terrace	2010- 08-25	pendant in the shape of tassel, with big wire loop on top end	cannot be assigned	16.5 x 3 x 3.5	
Box 16b	16	<i>yaowang</i> <i>pusa</i> behind left shoulder	2010- 08-25	band adornment of <i>pusa</i>	cannot be assigned	35 x 1.5 x 1.5	no photograph
Box 17	1	behind right foot of <i>jingang</i> GS8.12, next to <i>yaowang</i> <i>pusa</i> pedestal	2010- 08-25	wrist part of a <i>jingang</i> ?, not painted	cannot be assigned	23 x 10 x 7	Box I7-I
Box 17	2	behind right foot of <i>jingang</i> GS8.12, next to <i>yaowang</i> <i>pusa</i> pedestal	2010- 08-25	wave froth from scene of "500 <i>luohan</i> crossing the sea"	cannot be assigned	11 5 x 1	

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 17	3	behind right foot of <i>jingang</i> GS8.12, next to <i>yaowang</i> <i>pusa</i> pedestal	2010- 08-25	pendant decoration from <i>jingang</i> armour (skirt part), not painted	maybe GS8.12 ? cannot be assigned	6 x 3.5 x 1	
Box 17	4	behind right foot of <i>jingang</i> GS8.12, next to <i>yaowang</i> <i>pusa</i> pedestal	2010- 08-25	pendant ? or decoration of armour ?	cannot be assigned	4.5 x 2.5 x 0.5	no photograph
Box 17	5	behind right foot of <i>jingang</i> GS8.12, next to <i>yaowang</i> <i>pusa</i> pedestal	2010- 08-25	plate and bowl (attribute hold by a figure)	cannot be assigned	2.5 x 2.5 x 2.5	
Box 17	6	behind right foot of <i>jingang</i> GS8.12, next to <i>yaowang</i> <i>pusa</i> pedestal	2010- 08-25	part of robe (red)	red band near head of yaowang pusa	4.5 x 3.1	
Box 17	7	behind right foot of <i>jingang</i> GS8.12, next to <i>yaowang</i> <i>pusa</i> pedestal	2010- 08-25	piece of clay without paint layer	cannot be assigned	4 x 2 x 1.5	
Box 17	8	behind right foot of <i>jingang</i> GS8.12, next to <i>yaowang</i> <i>pusa</i> pedestal	2010- 08-25	four small pieces of clay wall ? with paint layer	cannot be assigned	3 x 2.5 x 1	0
Box 17	9	behind right foot of jingang GS8.12, next to yaowang pusa pedestal	2010- 08-25	male standing figure without head	cannot be assigned	20 x 7 x 6	

 storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 18	1	behind right shoulder of <i>yaowang</i> <i>pusa</i>		fish with head of a girl	from fish pond in area 2 > re- attached	16 x 4 x 2	B
Box 18	2	behind right shoulder of <i>yaowang</i> <i>pusa</i>		part of background with paint layer	cannot be assigned	11 x 5 x 7	CONTRAC
Box 18	3	behind right shoulder of yaowang pusa		part of background with paint layer	cannot be assigned	12 x 8 x 6.5	
Box 18	4	behind right shoulder of yaowang pusa		part of background with paint layer	cannot be assigned	8 x 9 x 4	
Box 18	5	behind right shoulder of yaowang pusa		part of background with paint layer	cannot be assigned	5 x 3 x 1	
Box 18	6	behind right shoulder of yaowang pusa		part of background with paint layer	cannot be assigned	4.5 x 3.5 x2	
Box 18	7	behind right shoulder of yaowang pusa		part of background with paint layer	cannot be assigned	5 x 4 x 2	
 Box 18	8	behind right shoulder of <i>yaowang</i> <i>pusa</i>		part of figure ?, hair ?	cannot be assigned	1.5 x 0.5 x 0.5	

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 18	9	behind right shoulder of yaowang pusa		fragment with paint layer	cannot be assigned	2.5 x 1 x 0.5	
Box 18	10	behind right shoulder of yaowang pusa		small round object (bead or attribute ?)	cannot be assigned	1 x 1 x 0.5	
Box 18	11	behind lap of <i>yaowang</i> <i>pusa</i> , right side		part of figure ?, hair ?	cannot be assigned	2.5 x 1 x 0.5	
Box 18	12	behind lap of <i>yaowang</i> <i>pusa</i> , right side		part of background with paint layer	cannot be assigned	1.5 x 1 x 0.5	6
Box 18	13	behind lap of <i>yaowang</i> <i>pusa</i> , right side		part of background with paint layer	cannot be assigned	4 x 2 x 2.5	
Box 18	14	behind lap of <i>yaowang</i> <i>pusa</i> , right side		fragment with gilding	cannot be assigned	2 x 1.5 x 0.5	

# Kongqueling wang

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 20	1	<i>kongqueling</i> <i>wang</i> tier 1, right side, behind feather halo	2010- 08-24	three fragments of wall plaster with paint layer	cannot be assigned	6.5 x 3	
Box 20	2	<i>kongqueling</i> <i>wang</i> tier 1, right side	2010- 08-24	part of the wall	cannot be assigned	6 x 8 x 4	
Box 20	3	<i>kongqueling</i> <i>wang</i> tier 2, right side	2010- 08-24	three fragments of wall plaster with paint layer	cannot be assigned	5.5 x 2.5	
Box 20	4	<i>kongqueling</i> <i>wang</i> tier 2, right side	2010- 08-24	lower part of peacock feather	cannot be assigned	7 x 4.5	
Box 20	5	<i>kongqueling</i> <i>wang</i> tier 2, left side	2010- 08-24	part of cloud (?) on a stick	cannot be assigned	2 x 1	~
Box 20	6	<i>kongqueling</i> <i>wang</i> tier 1, left side	2010- 08-24	fragment of a blue coving	cannot be assigned	4.5 x 4	
Box 20	7	<i>kongqueling</i> <i>wang</i> tier 1, left side	2010- 08-24	fragment of a white cloud	cannot be assigned	5 x 3 x 2	
Box 20	8	<i>kongqueling</i> <i>wang</i> tier 5, left side	2010- 08-24	two top parts of peacock feathers	cannot be assigned	9 x 6 x 2	
Box 20	9	<i>kongqueling</i> <i>wang</i> tier 5, right side	2010- 08-24	part of cloud (1985 ?)	cannot be assigned	8 x 7 x 1.5	8

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 20	10	<i>kongqueling</i> <i>wang</i> tier 6, right side	2010- 08-24	<ul> <li>necklace ? with beads</li> <li>part of necklace ? with beads on wire</li> </ul>	cannot be assigned	21 x 17	Box 20- 10
Box 20	11	<i>kongqueling</i> <i>wang</i> tier 7, right side	2010- 08-24	part of collar from PK9.52	cannot be assigned	6 x 2 x 1.2	
Box 20	12	<i>kongqueling</i> <i>wang</i> tier 1, left side	2010- 08-24	part of rock background	cannot be assigned	5.5 x 3 x 2	
Box 21	1	<i>kongqueling</i> <i>wang</i> tier 5, left side	2010- 08-24	top part of peacock feather	cannot be assigned	5.8 x 12 x 1.5	
Box 21	2	<i>kongqueling</i> <i>wang</i> tier 7, left side	2010- 08-24	stupa-shaped decoration of beads on wire	cannot be assigned	2 to 4 x 7.4 x 1.3	8
Box 21	3	<i>kongqueling</i> <i>wang</i> tier 7, left side	2010- 08-24	rosette ornament, gilded	cannot be assigned	2 x 2 x 1	
Box 21	4	<i>kongqueling</i> <i>wang</i> tier 4, left side	2010- 08-24	three top parts of peacock feathers	cannot be assigned	5 x 10 x 1.5	
Box 21	5	<i>kongqueling</i> <i>wang</i> tier 4, left side	2010- 08-24	ornament: pendant ?	cannot be assigned	4 x 6.5 x 0.8	

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 21	6	<i>kongqueling</i> <i>wang</i> tier 4, left side	2010- 08-24	part of robe	cannot be assigned	3 x 4 x 1.5	
Box 21	7	<i>kongqueling</i> <i>wang</i> tier 4, left side	2010- 08-24	small sticks (incense ?)	cannot be assigned	0.8 x 8 0.2	
Box 21	8	<i>kongqueling</i> <i>wang</i> tier 4, left side	2010- 08-24	<ul> <li>parts of the wall with paint layer</li> <li>wire</li> </ul>	cannot be assigned	7 x 9 x 3	Kated Constraints of the second seco
Box 21	9	<i>kongqueling wang</i> tier 7, left side	2010- 08-24	arm of a <i>tianwang</i>	cannot be assigned	9 x 11 x 4.5	
Box 21	10	<i>kongqueling</i> <i>wang</i> tier 1, left side	2010- 08-24	part of cloud tail	cannot be assigned	1 x 3.5 x 1	
Box 21	11	<i>kongqueling</i> <i>wang</i> tier 3, left side	2010- 08-24	strand of hair of figure	РК	1 x 3 x 1	
Box 21	12	<i>kongqueling</i> <i>wang</i> tier 2, left side	2010- 08-24	part of helmet of headgear of figure PK	РК	1 x 2.5 x 1	
Box 22	1	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	peacock feather	cannot be assigned	16.5 x 7 x 3	
Box 22	2	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	peacock feather	cannot be assigned	18.5 x 6.5 x 1.5	Exv.22
Box 22	3	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	top part of peacock feather	cannot be assigned	9 x 6.5 x 2	Box 22-5
storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
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Box 22	4	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	middle part of peacock feather	cannot be assigned	9 x 5 x 1	Bak 22-4
Box 22	5	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	middle part of peacock feather	cannot be assigned	8 x 4 x 1	
Box 22	6	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	lower part of peacock feather	cannot be assigned	6.5 x 4.5 x 1.5	
Box 22	7	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	fragment of peacock feather	cannot be assigned	4 x 3 x 0.5	
Box 22	8	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	fragment of peacock feather	cannot be assigned	3 x 2.5 x 1.5	
Box 22	9	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	fragment of peacock feather	cannot be assigned	3 x 1.5 x 0.5	····
Box 22	10	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	middle part of peacock feather	cannot be assigned	9 x 6 x 1.5	
Box 22	11	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	part of the wall plaster	cannot be assigned	6 x 5 x 0.5	
Box 22	12	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	part of the wall plaster	cannot be assigned	5 x 3.5 x 0.5	
Box 22	13	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	part of the wall plaster	cannot be assigned	3.5 x 3 x 0.5	

storage place	sub- divi- sion	place of finding	day of finding	description	original position	max. dimen. (cm) l x w (x d)	photograph
Box 22	14	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	part of the wall plaster	cannot be assigned	6.5 x 4.5x 0.5	80x72-14
Box 22	15	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	part of the wall plaster	cannot be assigned	5 x 2 x 0.5	Box 22:5
Box 22	16	<i>kongqueling</i> <i>wang</i> behind the feather halo, his right side	2010- 08-26	part of the wall plaster	cannot be assigned	5 x 4 x 0.5	Box 22-16
Box 22	17	kongqueling wang removed from wall because detached and very unstable	2010- 08-26	head of cloud whirl	cloud on left side, above the peacock feather halo	20 x 14 x 7	