Shuilu'an

Final report

East wall, northern part: *baoshen fo*

BMBF Forschungsprojekt / *Research project*
01UG1001

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 01UG1001
„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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Research Institute for Conservation of Cultural Heritage of Shaanxi Province 陕西省文物保护研究院

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CONTENTS

List of abbreviations used in the text

For the identification of the walls abbreviations with letters have been introduced which are also parts of the numbering system of the figures:

EN	east wall, northern part, *baoshen fo*
ES	east wall, southern part, *yingshen fo*
GS	southern gable wall
GN	northern gable wall
PK	southern partition wall, eastern side, *kongqueling wang*
PY	southern partition wall, western side, *yaowang pusa*
W	west wall

The position of the walls and the numbering system of all walls can be seen in figure 5.

Comment on the photographical illustration

As the time for documentation was limited, photographs were only taken during the work and under the current light conditions. As different types of electric lighting were used, and photographs were taken by several persons with four different cameras, differences occurred in the colour fault, resolution and perspective. These differences are visible in the illustrations included in this report.

Fig. 1
East wall, northern part (= EN wall) [Shaanxi Institute for Conservation 2005]

Fig. 2
EN wall before treatment with wooden prop as temporary support, October 9, 2011 [Shaanxi Institute for Conservation]

Fig. 3
Wall with scaffold during conservation, November 14, 2011 [Shaanxi Institute for Conservation]

Shuilu'an, *Shuilu dian* (All saints Shuilu hall)
Report on the conservation of the east wall, northern part (*baoshen fo*)
October and November 2011 and August 2012

Preface

The conservation of the northern part of the east wall was the latest continuation of the conservation work carried out in the Shuilu hall within the German-Chinese research project. Work on-site started in 2001 and continued in the years 2002 and 2007 to 2010. The work included damage assessment and conservation of the wall, the sculptures and reliefs and their polychromy as well as conservation tests for grouting and filling and climate measuring. Practical conservation work was done on the northern part of the west wall, a thorough examination and survey on the southern insertion wall. The results of the work have been described in the research reports 2007-2009 and 2010 which also can be found online as pfd files (www.rkk.ar.tum.de > Projekte und Forschung > China-Projekt > Publications).
In October and November 2011, the work for the first time concerned the front part of the hall. The conservation of the two sides of the eastern wall and their sculptural decoration had become necessary because on both sides the mountain sceneries in the upper parts had got tilted and deformed. By this process, figures and modelled elements had come loose and were put in danger of falling down. The damage had probably been developing over centuries, but was aggravated by the earthquake in May 2008, resulting in a serious tilt of the figure of a boy at the southern wall part above the head of the *yingshen fo*. The tilt had made it necessary to support some figures in the mountain scenery by wooden props.

On the Chinese side, Mrs. Yang Qiuying 杨秋颖 and Mr. Bai Chongbin 白崇斌 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 Centre for Conservation in Xi'an 西安文物保护修复中心, are in charge of the project. The situation was described in a short report written by Mrs. Yang Qiuying in October 2011. Her report also contains a proposal for the conservation measures. It served as the basis for the funding of the conservation work, which was granted on the precondition that one of the parts of the East wall had to be conserved in 2011. During a first visit of the German-Chinese group at the Shuilu'an, a preliminary assessment of the damage was made and the possible working conditions were discussed. It became evident that the northern part of the wall had a more serious problem of tilting and probably a larger amount of damage. The treatment of damage in the mountain sceneries is only possible from behind. While on the northern part of the wall, the back of the mountains can be reached from a scaffold set up in front of the wall, it is out of reach on the southern wall part because it is much higher and almost touches the rafters. The observation that there was a greater demand for a treatment, and the fact that the damaged parts were accessible with less difficulties, resulted in the decision to treat the northern wall part in 2011 and its southern counterpart at a later time.
Ms. Gao Yan 高燕 from the Shaanxi Institute for Conservation supervised the work on-site. Mr. Cai Bo 蔡博 and Mr. Yan Min 严敏 took part in the practical work on selected days. Mr. Wang Yang 王阳 and Ms. Liang Qing 梁晴, students at the North-West University 西安西北大学, participated in the work. On the German side, Catharina Blaensdorf from the Technical University of Munich stayed in China between October 8 and November 20. Additionally two free-lanced restorers, Stefan Demeter and Maximilian Knidlberger, were involved into the work (October 13 to November 13).
The work focussed on the conservation of the endangered upper part of the EN wall (mountain scenery). After setting up the scaffold and cleaning the wall, the conservation was started from the top downwards. The fixation of the mountains was accompanied and

followed by conservation of detached or loose sculptures or parts of sculptures. An especially time-consuming step of the work was the conservation of numerous broken *piaodai* (flying bands). This work could not be finished in 2011 and was continued in 2012. The fine-cleaning and the consolidation of the paint layers were not part of agenda. It was postponed to a later time until the adjacent walls (gable walls) will be cleaned.
The presence of the scaffold offered the opportunity to see details that normally are almost invisible. Two more sculptures were discovered hidden in the north-east corner. Details of construction and modelling became evident. A particularly interesting observation is that both *feitian* (flying deities) emerged to be male and double-headed. They are a quite unusual depiction of the *feitian* which are generally regarded as representations of *apsaras*, beautiful flying and dancing female deities.
Another important observation, concerning the history of the building, is that, on the EN wall, there are clouds made in the same mould as on the *kongqueling wang* wall. On the base of our examinations in the years 2007 and 2010 it could be proved that the *kongqueling wang* wall had been decorated at the same time as the west wall. The examination of the northern part of the east wall (EN wall) in 2011 showed that the same clouds were used here and on the *kongqueling wang* wall. The conclusion of this observation is that the east wall was decorated at the same time as the *kongqueling wang* wall and thus also as the west wall. The assumption that the west wall is older than the front part of the hall could thus be disproved definitely.

In 2012, the work on the wall was continued with the aim to finish the conservation started in 2011. This comprised to finish the conservation of the *tianwang* sculptures, mainly those north of the *baoshen fo*, and to re-attach the *feitian* EN 4.5. Further aims were to lift and stabilise the statue of the bodhisattva (*pusa*) in the north-eastern corner, and to find a method for the conservation of the elements modelled over a wire core which could not be treated in 2011. Especially endangered were the fragmentarily preserved bead chain pendants made of small clay elements threaded on iron wires. Additionally, attempts were made to re-attach as many of the findings made in 2011 and 2012 as possible. The stabilisation treatment of 2011 was controlled and partly repeated where broken elements were still loose.
On the Chinese side, Mrs. Yang Qiuying 杨秋颖 was in charge of the project. Ms. Gao Yan 高燕 worked with the German team on-site. The German team consisted of Catharina Blaensdorf and the free-lanced restorers Stefan Demeter and Daniel Scherzer.

DESCRIPTION OF THE WALL

The east wall constitutes the entrance to the Shuilu hall. It has five bays (in Chinese *jian* 间). The three central bays of the east wall contain the doors leading into the hall. Only the bays next to the two corners of the hall are filled out with walls. These two wall parts were labelled as "**e**astern wall, **n**orthern part" (EN wall) and "**e**astern wall, **s**outhern part" (ES wall) (fig. 5). Both are decorated with sculptures. The general design of the two wall parts is the same (fig. 4): a large Buddha figure is surrounded by twelve small figures and surmounted by a mountain scene, while a bodhisattva attends to the Buddha on each side. The Buddha and the two bodhisattvas are positioned on top of a dais. There is a canopy over the head of the Buddha.

While at first sight the two wall parts seem to be very similar, a closer look reveals that there are numerous differences in the details of the modelling and the manufacture technique. The most important difference regarding the overall design is that the mountain scenery of the ES wall is about 50 cm higher than the one of the EN wall.

EN wall: *Baoshen fo* ES wall: *Yingshen fo*

Fig. 4
Northern (EN) and the southern (ES) part of the east wall [Zhen Gang, Shaanxi Institute for Conservation, 2005]

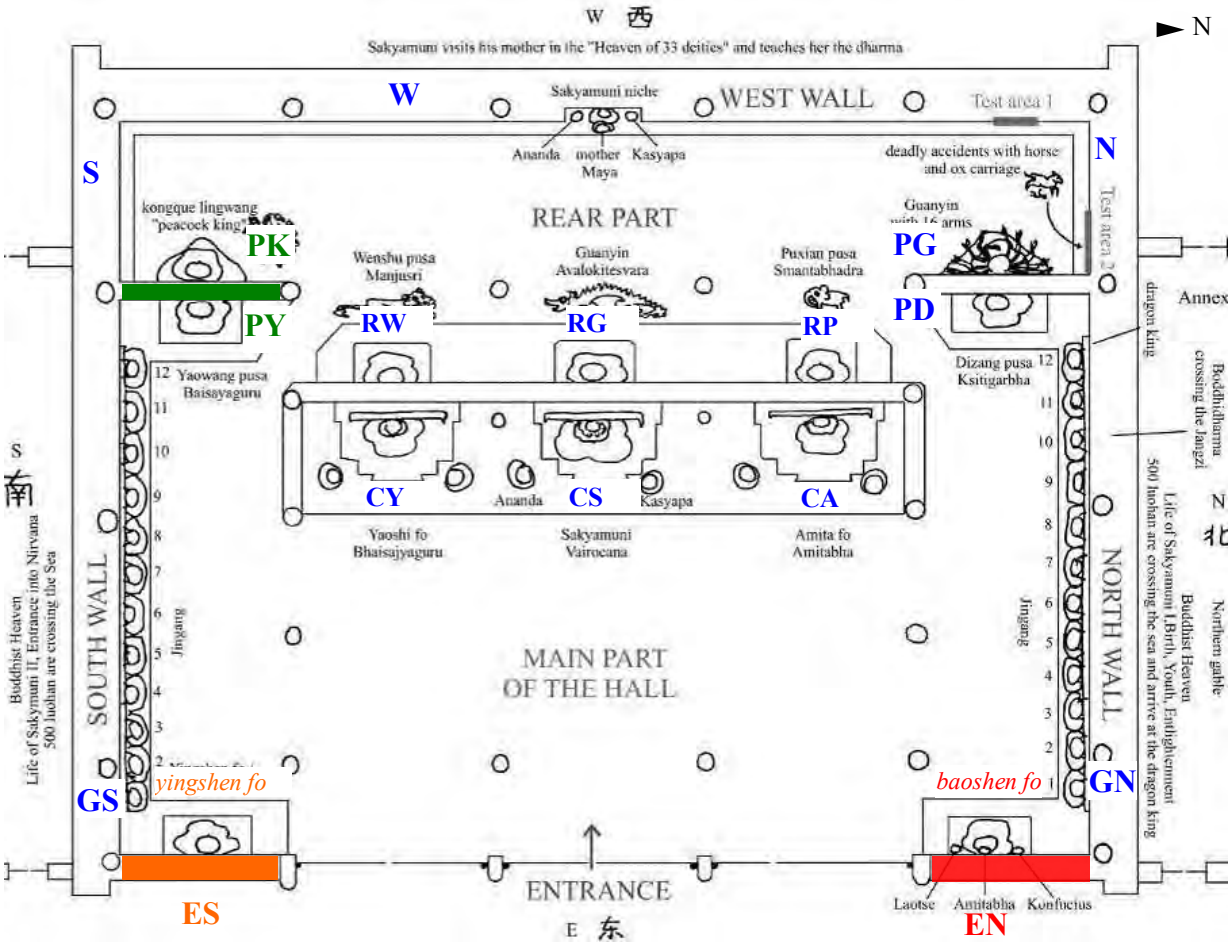


Fig. 5
Ground plan of the Shuilu hall. The letters indicate the abbreviations for the individual wall parts.

Numbering of figures and parts of relief

The numbering is based on the system set up by Siegfried Scheder and the restorers of the Center for Conservation, Zhang Xiaorong 张孝绒, Liu Linxi 刘琳西, Yang Qiuying 杨秋颖, and Dang Xiaojuan 党小娟 in July 2002. As the big Buddha sculpture was numbered as BU 4, the smaller figures are numbered as 4.1 to 4.23.

In 2011, the numbering system was slightly expanded: Placed in front of the individual numbers, the prefix "**EN**" was added as abbreviation for "**E**ast wall, **n**orthern part" in order to distinguish it clearly from the other walls. "**GN**", already introduced in 2007, indicates the **g**able wall, **n**orthern side. Three figures did not have numbers yet, all of them hardly visible from below and omitted in the numbering system of 2002 probably for that reason: a small white corpse lying on the southern end mountains (EN 4.23) and two monks hidden in the corner between east wall and northern gable wall (GN 7.19a and GN 7.19b). In order to facilitate the orientation also the mountains, clouds and pagodas were numbered as well. The numbering system can be seen in fig. 6 and 7. Table 1 gives an overview on the abbreviations used. Table 2 gives the names of the figures which can be identified.

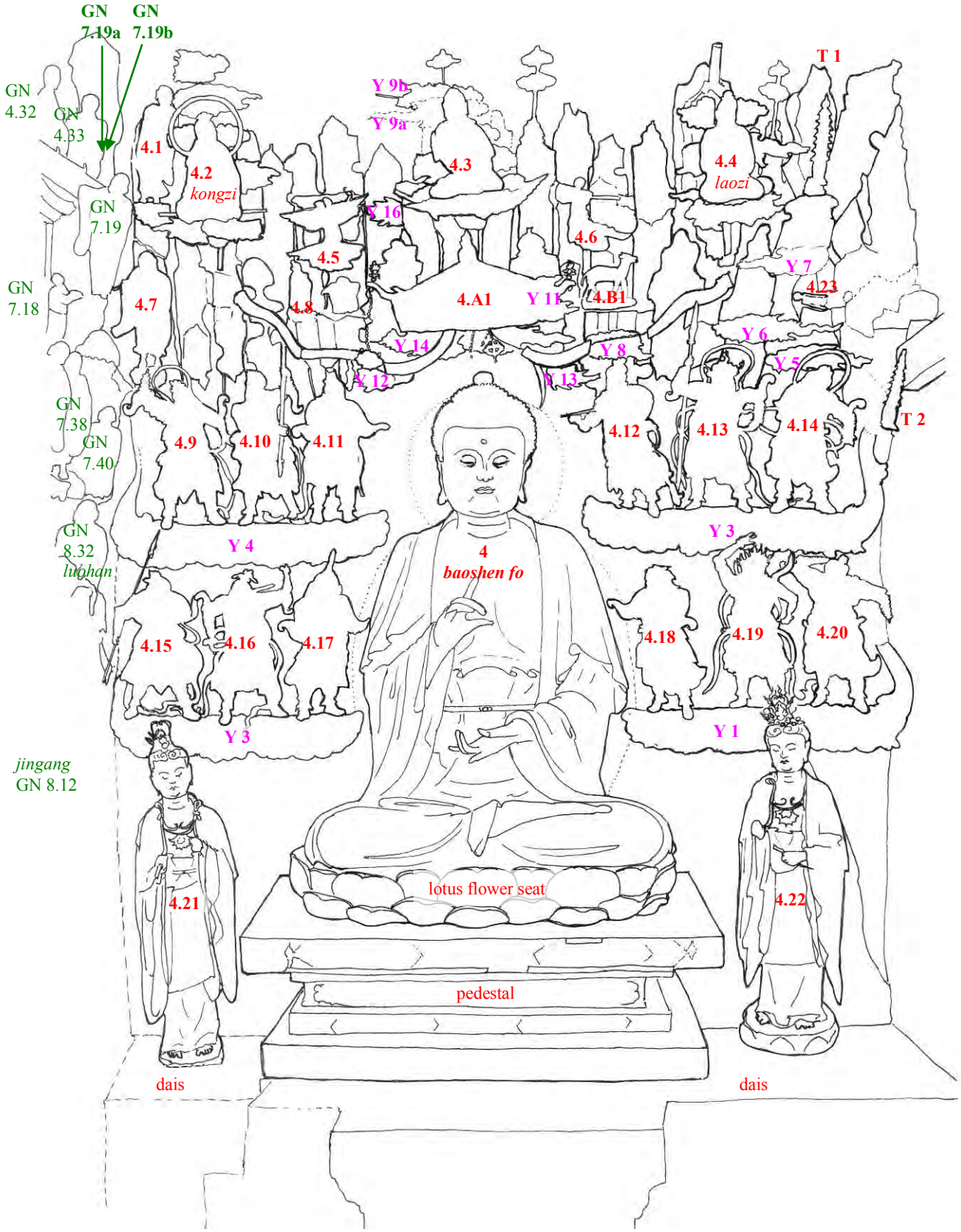


Fig. 6
East wall, northern part: Numbering of figures and parts of reliefs
Red: EN wall, figures, pink: EN wall, clouds, green: GN wall figures

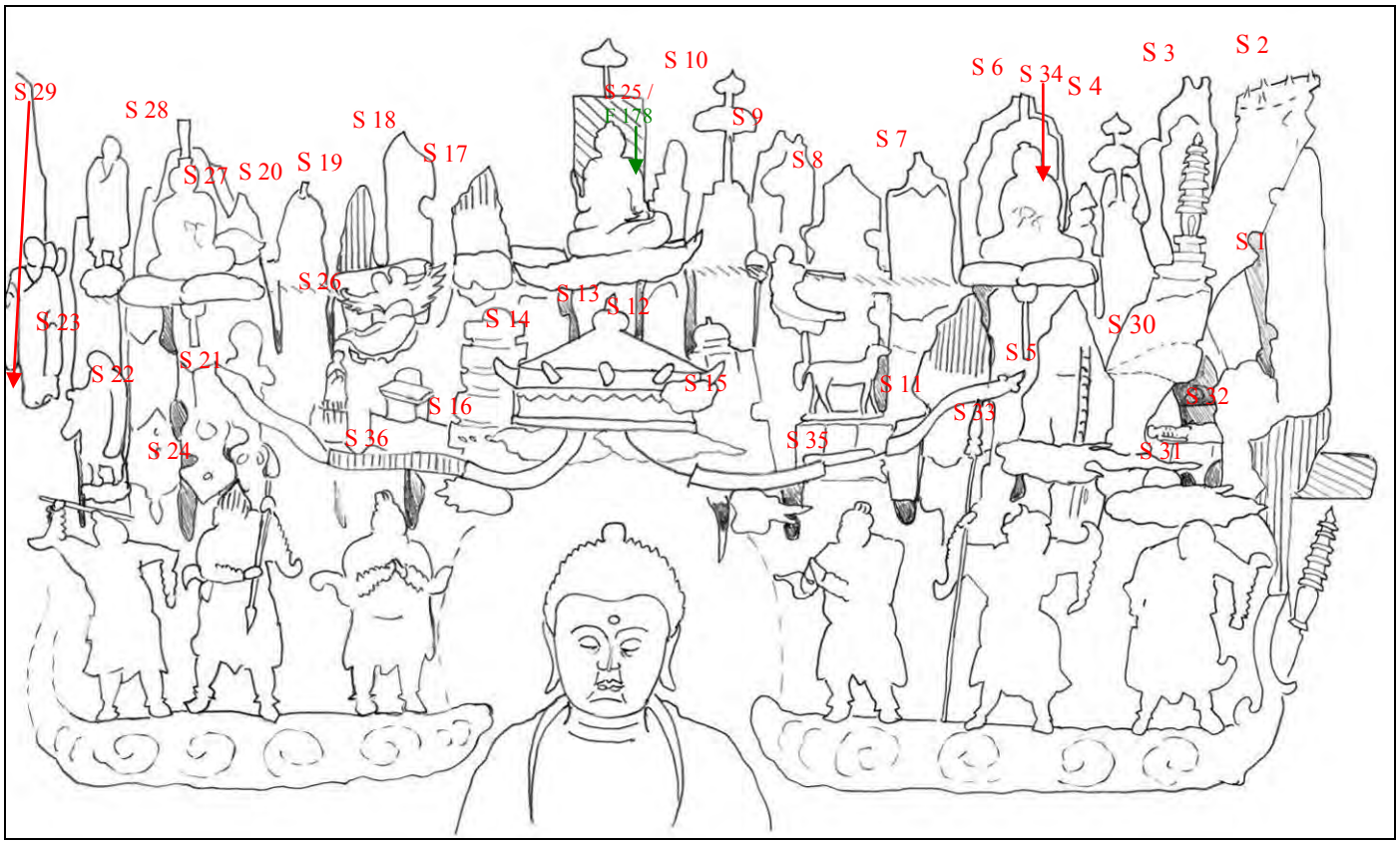


Fig. 7
Numbering of mountains (**S** = *shan* 山) by the Chinese restorers; numbers S 24 to 36 added in Munich

Table 1
Identification codes for numbering of figures and relief parts on EN wall

ID code	*abbreviation for*	*indicating*
GN	gable, north	northern gable wall
1.-8.	figures in areas 1 to 8 of gable wall	human figures on GN wall
GN 8.1-8.12		big jin*gang*
EN	east, north	east wall, northern part
4	BU 4	large Buddha in front of EN wall
4.1 – 4.23		human figures of EN wall
A	"architecture" (2002)	canopy on EN wall
B	"beast" (animal, 2002)	deer on EN wall
S	"*shan*" 山 (2011)	mountains on EN wall
T	"*ta*" 塔 (2011)	pagodas on EN wall
Y	"*yun*" 云 (2011)	clouds on EN wall

Table 2
Identification codes of figures

ID code	*position*	*representing:*
BU 4	big Buddha in front of EN wall	*baoshen fo*
4.1, 4.7	mountain S 23, left side	monks
4.2	mountains, left side, top	*kongzi* (Confucius)
4.3	mountains, centre, top	*shijiamouni* (Sakyamuni)
4.4	mountains, left side, right	*laozi* (Laotse)
4.5 and 4.6	mountains, centre, flanking 4.3	double-headed, male flying deity *feitian*
4.9-4.20	left and right of *baoshen fo*, two tiers	*tianwang* (twelve figures)
4.21 and 4.22	on dais, flanking the *baoshen fo*	*pusa* (bodhisattva), in monks' garment (kashaya), with jewels and crown
4.23	cave between S30 und S 32	corpse (?)

Depicted figures and scenes

Baoshen fo with attending pusa

The three largest figures form the lowest part of the wall. They are standing on the dais:

Baoshen fo (EN 4)

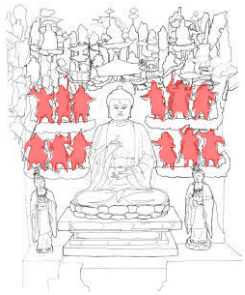
The big figure of a Buddha (about 178 cm in height including lotus pedestal), was identified as *baoshen fo*. He is sitting in *ardhapadmāsana* ("lotus position", the legs crossed, only the right foot visible, the sole of the foot pointing upwards). His right hand is raised to the level of his chest while his left hand, the palm pointing upwards, is lower (in front of the abdomen). There is no evidence that he was holding an attribute in his hands. His skin is golden; the robe is leaf-gilded with red lining. His hair shows the bluish grey paint that is used as underpainting for blue and green in other parts of the hall. He is sitting on a flat lotus flower seat (oval in ground view) showing two rows of petals. The lotus flower seat is resting on a square pedestal which has five steps. The steps originally were decorated with mould-made ornaments which are almost completely lost. Above his head there is a canopy with two *piaodai* and a 'curtain' of beaded chain pendants.

Pusa (EN 4.21 and EN 4.22)

Two standing *pusa* (bodhisattvas) flanking the *baoshen fo*, EN 4.21 and EN 4.22 measure 117 and 115 cm.[1] They are robed in monks' garments (a kashaya over a floor-length skirt), but wear necklaces and richly decorated crowns. Their skin is white, the feet are bare. They are standing on small lotus flower bases (round in ground view). *Pusa* EN 4.21 was holding an elongated attribute. Fragments of leaves and pointed, fruits or blossoms with red paint found at the foot of the figure indicate that he was holding a twig with fruits of blossoms. *Pusa* EN 4.22 may have held a twig as well, as a wire in his left hand is preserved.

Smaller figures attached to the wall

Twelve tianwang *(EN 4.9 to EN 4.20)*



Above the heads of the *pusa*, up to the level of the head of the *baoshen fo*, there are twelve smaller figures (about 55 cm high, including raised hair or headgear 58-59 cm). They wear suits of armour and weapons and thus have been interpreted as *tianwang* 天王 (kings of heaven) or *jingang* 金刚 (vajra deities)[2]. Four of them (EN 4.11, 4.13, 4.16 and 4.18) have friendly white faces, while the others have a dark, reddish-brown skin and fierce faces with bulging eyes. The figures are arranged in two tiers interrupted by the *baoshen fo*, forming four groups of three figures. Each group is standing on a cloud ledge (Y1 to Y 4). The figures of the lower tier next to the *baoshen fo* wear caps shaped like animal heads or made of their hide: EN 4.17, on the northern side, wears a cap made of a boar or elephant head, EN 4.18, on the southern side, one made of a lion (or tiger) head.

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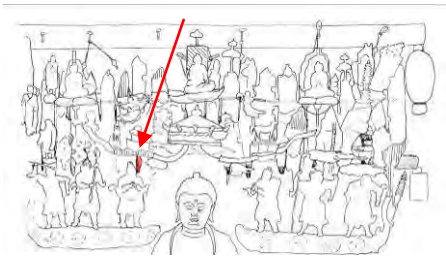
1 Measured including pedestal, but excluding the crown. At EN 4.22 the lowest part of the pedestal is covered by a later plaster.

2 The interpretation as *jingang* is given in the report by Yang Qiuying 2011.

Mountain scenery

Above the heads of *tianwang* and *baoshen fo*, the solid wall ends and is replaced by a mountain scenery, formed by rock columns interspersed with clouds and figures. There are 23 vertical rock columns and some smaller rock blocks attached in front of them.

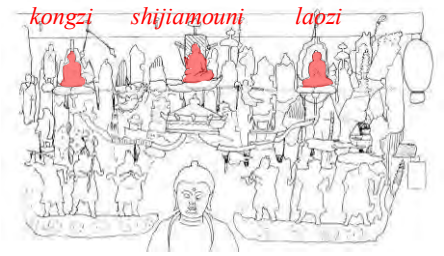


The rock columns are partly connected with each other, but also separated by openings through which the wooden construction of the wall behind is visible. The lowest openings can be found just above the top of the wall, behind the necks of the upper tier of *tianwang* and thus at the very feet of the mountains. Behind the opening slightly to the south of figure EN 4.11 (see red arrow in sketch to the right of the text) four small porcelain dishes were found (three identical dishes, round with blue pattern showing three peaches, and a square dish), maybe dating from the Ming Dynasty. Zhao Liang and Ma Xifeng assume that they were used as oil lamps. There are traces of a transparent material on the outside of two dishes.[3]

Figures in the mountain scenery

There are ten figures and two pagodas positioned in front of the mountains:

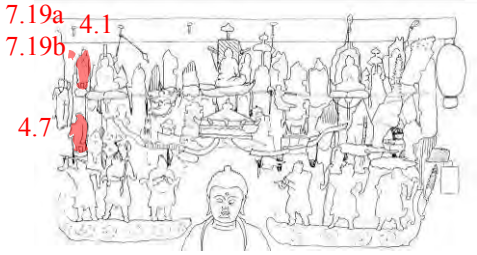
The three teachers, kongzi, shijiamouni and laozi (EN 4.2 to 4.4)



In the upper part of the mountains, there are three figures, identified as *kongzi* (Confucius, EN 4.2) on the northern end (left side) of the wall, *shijiamouni* (Sakyamuni, EN 4.3) in the centre and *laozi* (Laotse, EN 4.4) on the southern end (right side) of the wall. The three figures show the founders of the two philosophies (Confucianism and Daoism) and the religion (Buddhism) important in China. The figure of *shijia-mouni* was identified elsewhere as Amitabha (*amitou fo*).[4]

The three figures may represent a syncretistic aspect that is immanent of the Shuilu rite. *Kongzi* is holding a long, pole-shaped attribute painted black in his left hand. The thin twig-shaped attribute in the right hand of *laozi* probably was the stem of a mushroom.

Monks (EN 4.1 and 4.7, GN 7.19a and 7.19b)



Towards the northern end of the wall next to the northern gable wall (GN wall), there are two figures of standing monks (EN 4.1 and 4.7) attached to the mountain furthermost to the north (S 23). The two sculptures are placed one above the other, the upper one (EN 4.1) is standing to the left of *kongzi* (EN 4.2). EN 4.1 and EN 4.7 are holding a flat rectangular object in their right hand, maybe a book.

Two more monks are hidden behind S 23. They are standing on a mountain ledge which is part of the northern gable wall (GN wall). As they had not detected and thus not numbered in 2002, they were numbered as GN 7.19a and GN 7.19b in 2011. GN 7.19a is an old monk with

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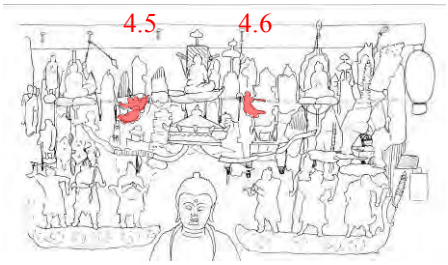
[3] The dishes have been stored in the south annex by Mr. Zhao Liang in 2011.

[4] The interpretation was given by Angelika Borchert in her descriptions of the temple in 2000 (unpublished notes).

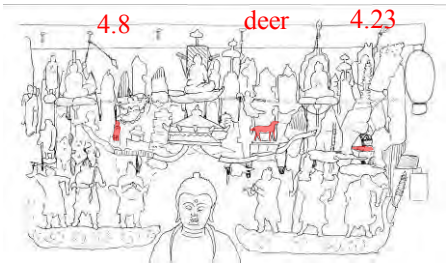
white skin. He is presenting a flat rectangular object (scripture scroll?) on the palm of his left hand. GN 7.19b has a reddish brown skin and fierce face with bulging eyes. He is holding a golden *vajra* in his left hand. GN 7.19b is leaning towards GN 7.19a as if they were having an animated discussion. Next to the right shoulder of GN 7.19b there is a mountain. It serves to support figure GN 7.19, a preaching (?) monk[5] mounted in front of the wall. Behind the heads of GN7.19a and 7.19b there is a terrace with a parapet. On top of the terrace three monks are sitting (GN 4.31 to 4.33).

Feitian (EN 4.5 and 4.6)



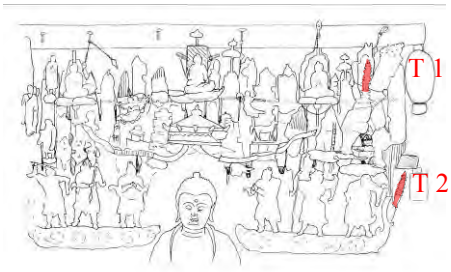
Between the figures of the three teachers, but positioned slightly lower there are two flying deities, *feitian* 飞天, EN 4.5 and 4.6. Usually *feitian* is used for the deities called *apsaras* in Sanskrit, beautiful young ladies depicted dancing or flying and making music. The *feitian* of the EN wall, however, are male and double-headed. The heads appear to be shaven in a monkish habit, though tufts of hair are left at the temples. Jewellery is placed on the bare chest; the long floating skirt covers the feat. They have large wings of fine golden feathers, most of which are lost today.

Figures in small niches (EN 4.8, EN 4.B1, EN 4.23)



Below the skirts of the *feitian*, two smaller figures can be found. They are standing in niches formed by the mountains. On the northern (left) side, below *feitian* EN 4.5, there is a man (EN 4.8, ca. 23 cm high), standing next to a table or pedestal on which a lost object was resting. The counterpart is a white animal (EN 4.B1) which has been identified by the Chinese colleagues as a deer (*lu*).[6] Two thin wires indicate that it was holding something in his mouth. In a rock niche at the southern (right) end of the wall, and slightly lower than the man and the deer, a white emaciated and naked body is lying, probably a corpse (EN 4.23).

Pagodas



There are two pagodas integrated into the mountain scenery, both situated towards the southern (right) end of the wall. The upper one (EN 4.T1) is standing on a mountain, the lower one (EN 4.T2) is attached to the side of the wall next to the cloud tail flowing down into the cloud ledge at the feet of the *tianwang* EN 4.18 to 4.20.

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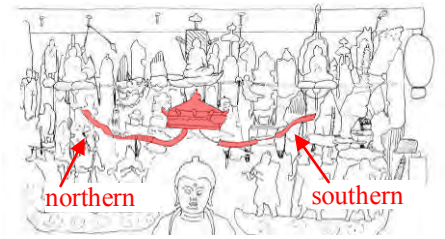
5 GN 7.19 (see fig. 6) is a monk standing in front of a hut-like building; he is talking or preaching to a boy, his right hand raised, the left holding a twig with fruits, maybe peaches.

6 The deer has no antlers, so it could be a doe. Imprints on top of the head, however, can be interpreted as positions of antlers. They have been lost even before the deer was painted or have never been executed properly.

Canopy (EN 4.A1) with flying bands (piaodai)



Above the head of the *baoshen fo* there is a canopy (EN 4.A 1). A short drapery is hanging from an oval red ring. Above the ring, a tent-like cover rises to a central pole. Five radial arms, their head shaped like clouds protrude from the ring. Originally a complicated system of beaded chain pendants was attached to the arms. They are now reduced to short fragments still hanging from two of the arms. Numerous broken beads, decorative elements and short fragments of chains were found next to the *pusa* EN 4.21 (*for the fragments: see Findings, p. 185-190*). From underneath the canopy, two long red flying bands, *piaodai*, are floating to both sides. Clouds are attached inside and below the canopy and on both sides (north and south) of the ring.

Dimensions of figures and wall parts

Some parts of the wall were measured. Table 3 and 4 give the measures taken during the conservation work.

Table 3.
Height of wall elements measured from the tile floor[7]

position	*height above floor [cm]*
dais, brick revetment	77 (measured at left and right side)
top of pedestal of *baoshen fo*	132
top of lower cloud ledge (Y1 and Y2)	195
openings through wall, lower edge	306
beam of 1981-85 behind top of mountain scenery	429
openings through wall, lower edge	306

Table 4.
Height of figures

position	*height of figures [cm]*
baoshen fo including lotus seat	ca. 178 (calculated)
pusa (EN 4.21 and 4.22, including crown and lotus pedestal)	117 and 115 cm (with pedestal, without crown)
tianwang (EN 4.9 – 4.20, including headgear or hair)	58-59 (measured on northern side of wall)
small sculpture EN 4.8, including remodelling of legs	23 (measured)

[7] The evenness of the floor level was not checked and may differ as much as several centimetres: Differences in the floor level were measured in other parts of the hall in 2010 (*see: Annual report 2010*).

TECHNIQUE OF CONSTRUCTION OF WALL AND MODELLING OF SCULPTURES

The construction of the wall can be subdivided into the wooden pole construction and the clay wall. Reliefs and sculptures are attached to the clay wall, but the mountain scenery surmounts the clay wall and is modelled in front of the wooden construction.

Wall construction

Wooden construction

The wooden elements are part of the pole construction of the hall: Wooden columns are connected to each other by a system of lintel, ties, beams and thinner panels. The types of joint connections were only partly visible. The construction system is demonstrated in figs. 8 to 14. Measurements are given in fig. 14a and table 5. The parts of the wooden construction have been numbered to facilitate the description and recognition of the single parts.[8] The numbers can be found in the construction sketches fig. 8 to 11 and 14 to 15; they are given in brackets () in the following description.

The two uprights between the doors are not wooden columns, but pillars made of stone with octagonal cross section. They are up to maximum of 42 cm wide. The column in the corner to the northern gable wall consists of wood.[9]

Along the entrance wall (i.e. in north-south direction), the columns are connected to each other by lintels (8) and a set of five rectangular ties and panels, (2), (8), (9), (10), (11) and (15). On top of the set the purlin (12) is resting (diameter 43 cm). Each lintel (8) is mortised into the columns. It is positioned above the door frames (lower edge at a height of 306 cm above the floor).

In the middle of each of the five bays (*jian* 间, i.e. the spacing between two columns), there is an intermediate corbel bracket (*dougong* 斗拱, fig. 11-13). The *huagong* 华拱 ("flower arm", 6 and 7) protrudes to the outside and to the inside. A tie with rectangular cross section, in Chinese 枋木 *fangmu* or 井口枋 *jingkoufang* (=*fangmu* on the inside), is inserted into a groove of the "flower arm" (fig. 9 and 11: (2), height 8 cm). The *fangmu* is preserved behind the mountains of the EN wall, but missing, inside and outside, in all the other bays. The upper panel of the north-south connecting construction (10) is inserted between two decorated "arms" (16 and 17) at the corbel bracket and at the column. Two panels (fig. 10: (13) and (14)) concealing the purlin from underneath. They were keyed into a slot at the corbel brackets and above the columns. While the panels at the outside (14) are still existing, those on the inside (13) are mostly missing. Only the ones between corbel bracket and northern corner of the EN wall and the two parts behind the ES wall are preserved.

The columns are connected in east-west direction to the columns inside the hall with two wooden beams (traverse). The lower one, rectangular in cross section (fig. 8: (A)), is mortised into the stone pillar. The upper one (fig. 8: (B)) is round and connected with the construction in north-east direction by mortising the tie (11) into the beam (B). Thin panels (fig. 14: (13), inside and (14), outside), inserted into a groove of the upper beam (B) and into the corbel bracket in an inclined angle were hiding the purlin. These panels are still existent on the outside (panels renewed), but they are missing on the inside except for the part between corbel bracket and corner of the EN wall and the two panels behind the ES wall.

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[8] The numbering was done by Gao Yan and M. Knidlberger. Parts omitted in this first numbering were numbered later by C. Blaensdorf (numbers 15-18).

[9] The column is visible inside the wide crack that has opened between the northern gable wall (GN wall) and the EN wall.

Fig. 8
Wooden construction of EN wall with stone pillar, schematic drawing (not in scale). Numbering of wooden elements by Gao Yan and M. Knidlberger 2011.

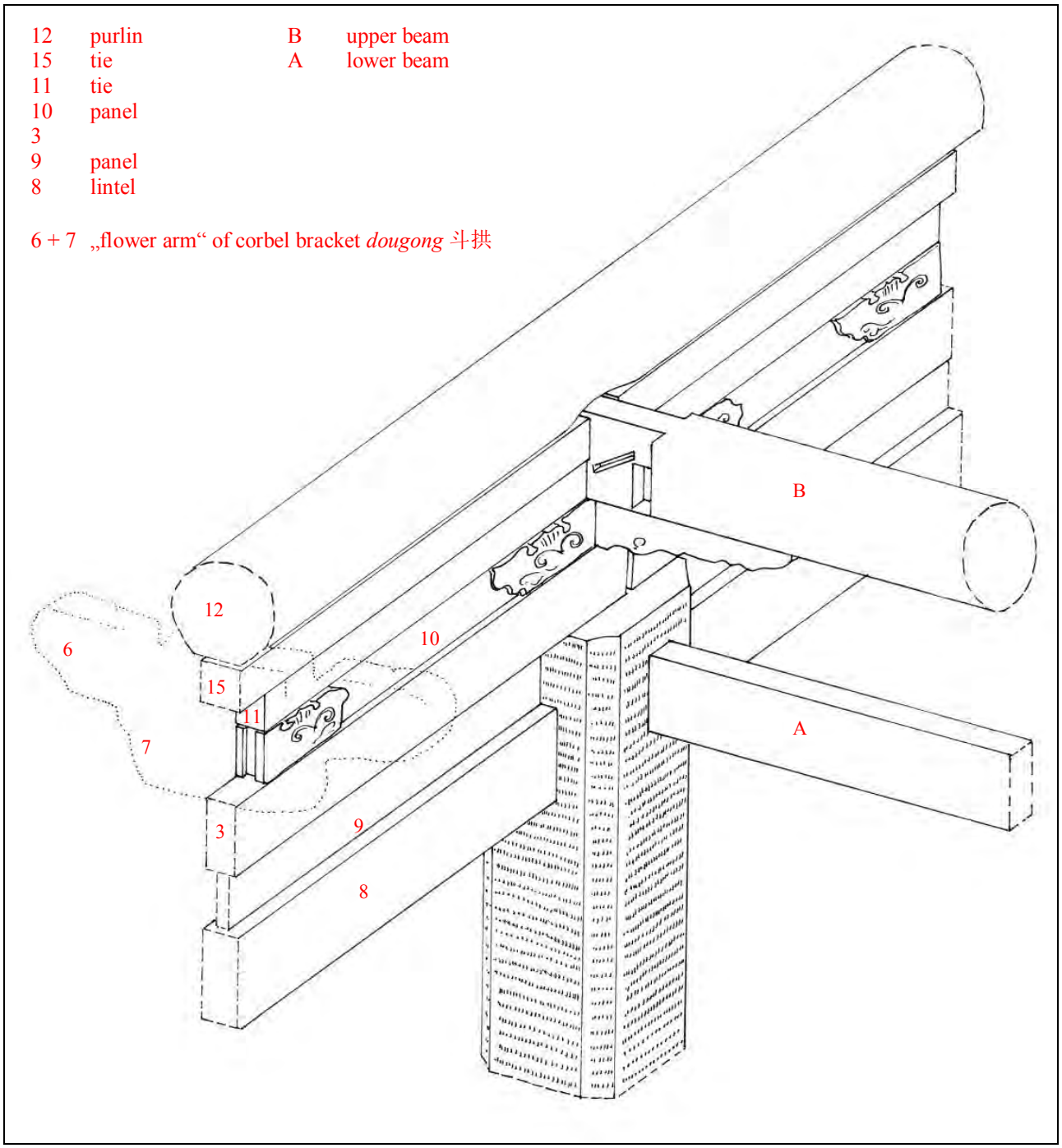
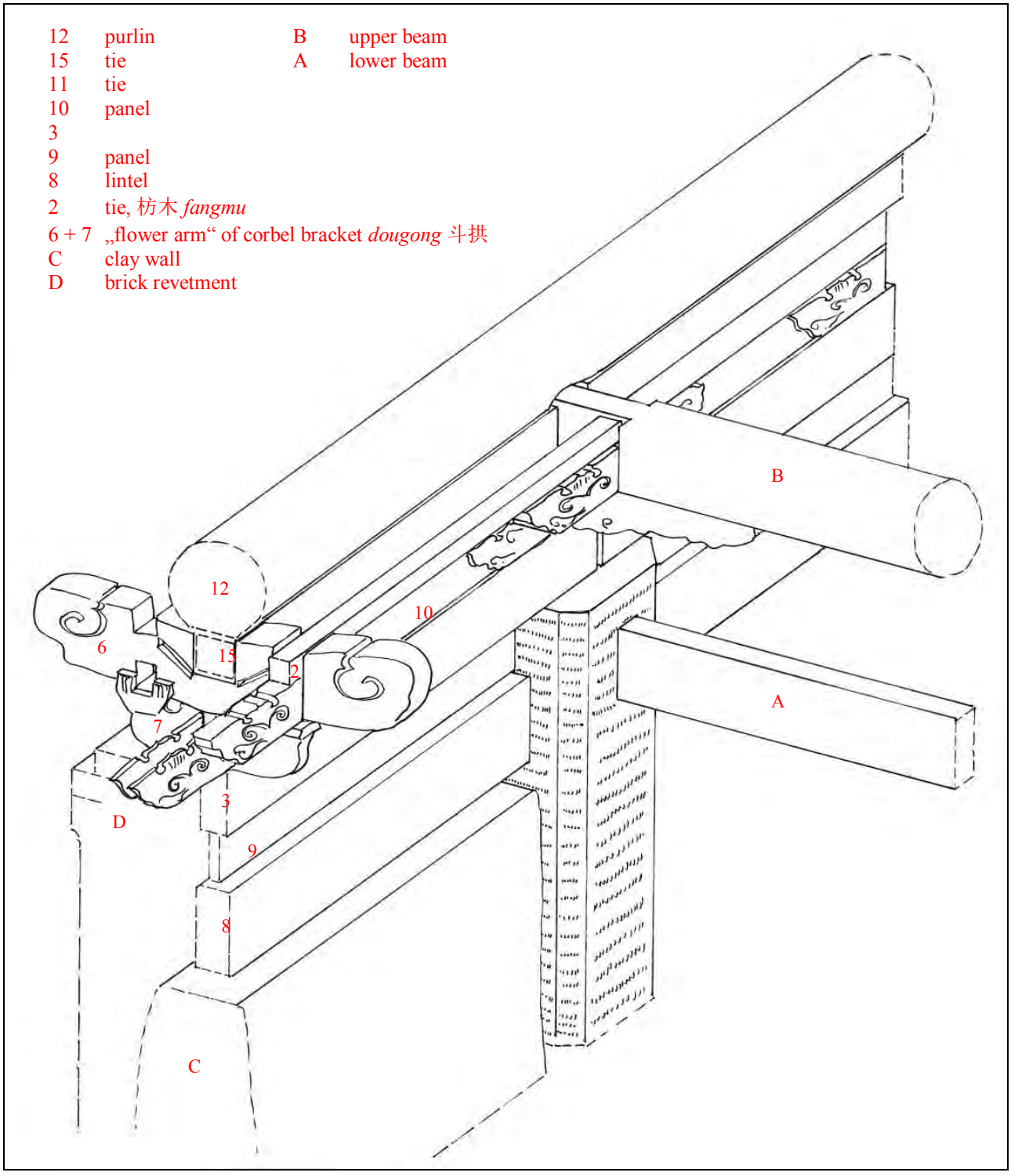


Fig. 9
Wooden construction of EN wall, with *fangmu* (2), intermediate corbel bracket, clay wall and edge of modern brick revetment of the outside



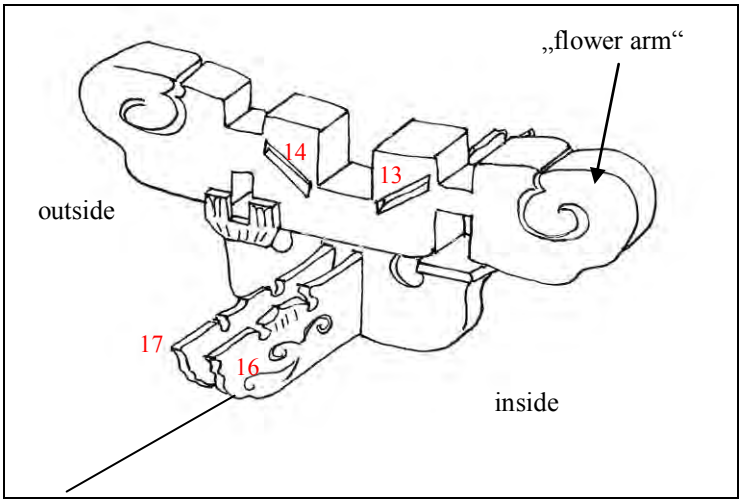


Fig. 10
Corbel bracket behind *shijiamouni* EN 4.3, schematic drawing
13 + 14: panels hiding the purlin
16 + 17: arms in wall direction

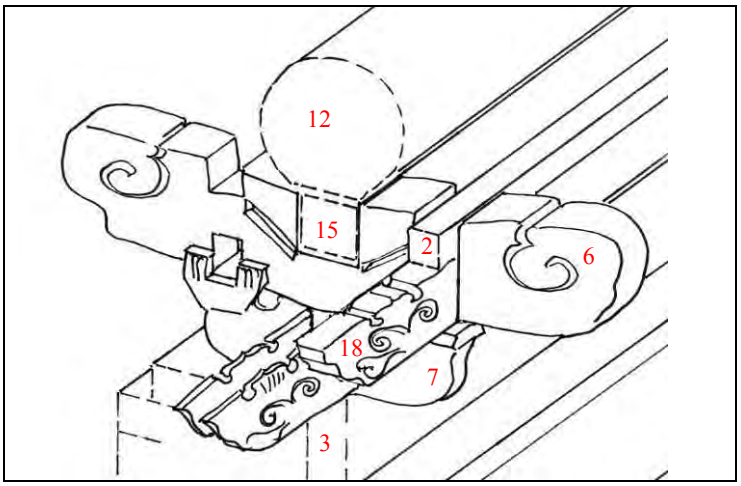
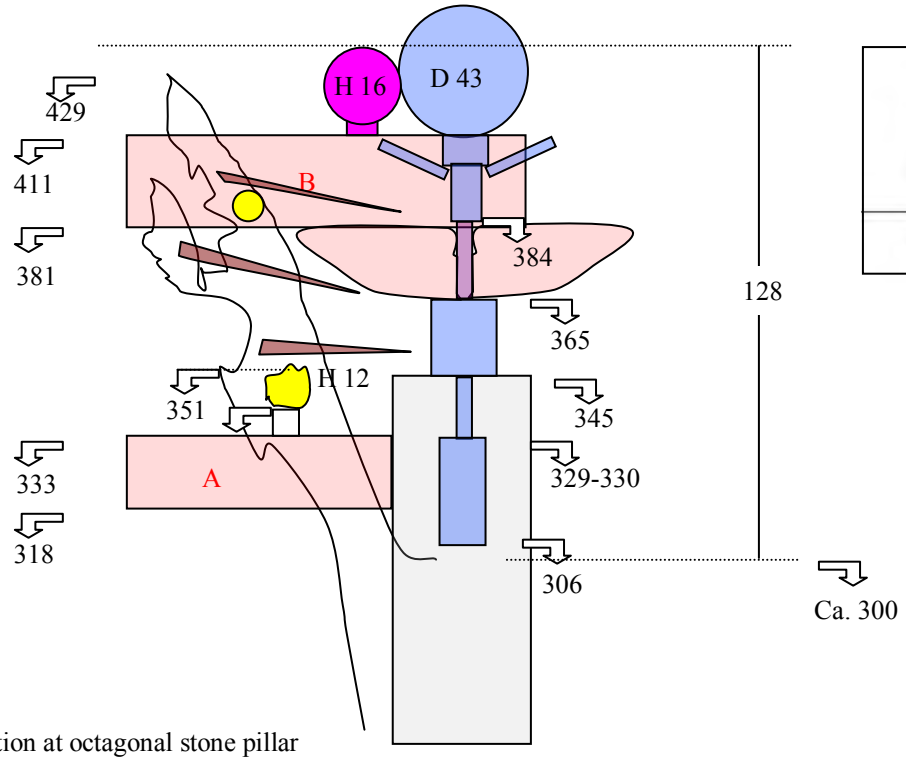
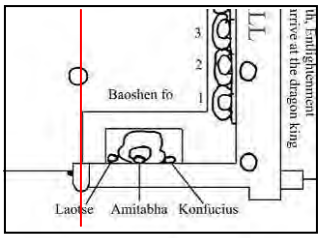


Fig. 11
Corbel bracket with *fangmu*.
2: *fangmu*
3: constructive element (rectangular beam)
6 + 7: “flower arm” of corbel bracket
12: purlin
15: tie

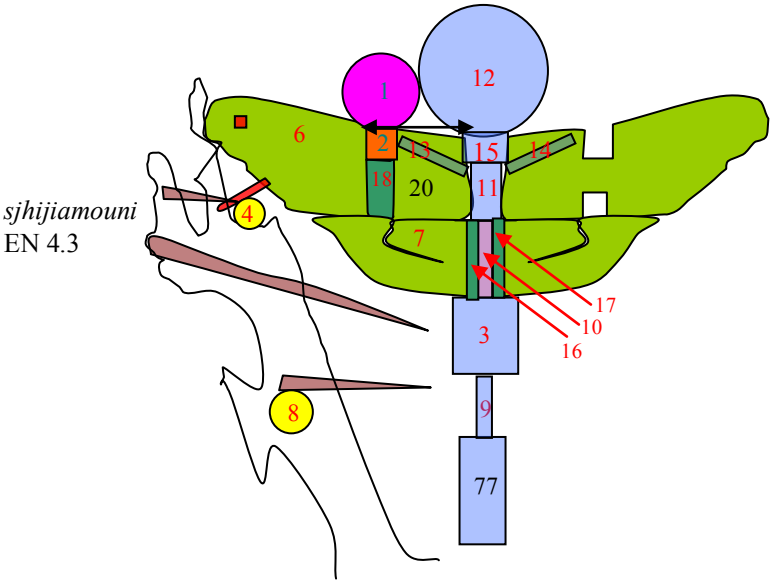
Fig. 12
Corbel bracket, right side, seen from inside; to the right: *fangmu* (2) and supporting bracket

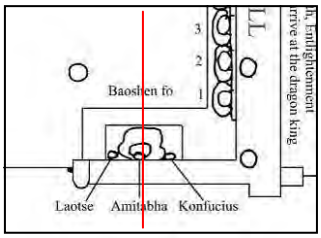
Fig. 13
Corbel bracket, left side, seen from outside, after removal of panel (10)





a: Section at octagonal stone pillar
Grey: Octagonal stone pillar,
Light red: crossbeams in west-east direction (A, B). Measures taken from floor.





b: Section at corbel bracket
Red numbers: Numbering of wooden parts:
Blue: elements in north-south direction, with purlin (12); orange: *fangmu* (2)
Green: corbel bracket with "flower arm" *huagong*, (light green: 6, 7) and arms in wall direction: dark green
Pink: Beam inserted in 1981-85 (1).
Yellow: poles inside mountains (4, 5),
Brown: wooden pegs
Red: iron pins.

Fig. 14 a and b
Wooden construction behind the mountain scenery (not in scale).

Table 5
Sequence of horizontal wooden elements connecting the columns (from top to bottom).

part	*number*	*connection*	*height or diameter*
north-south direction			
purlin	12	lying on top	d: 43
two rectangular ties	15 11	?	h (11+ 15): 30
panel	10	inserted between corbel bracket brackets	h: 18
rectangular timber	3	?	h: 20
panel	9	?	h: 16
rectangular lintel	8	mortised into column (tenon on lintel)	h: 14
fangmu	2	inserted into groove of W-E beam	h: 8, w: ca. 8
east-west direction			
upper beam	B	connected to tie 11	h: 30
lower beam	A	mortised into column (tenon on beam)	h: 25

Clay wall (lower part of the wall)

The structure and the material of the clay wall are not visible at any place. It can be assumed that the structure corresponds to the walls investigated before (west wall, rear part of the north wall, southern insertion wall): the lower part probably consists of rammed earth, while the upper is made of adobe bricks. The adjustment of the adobe bricks is unknown. Joints visible from above may indicate that the adobe bricks at the top of the wall are arranged lying and as stretcher bricks (fig. 23).

The dimensions of the wall can be estimated from the measurements taken during the work. The width of the wall was stated by Yang Qiuying's report to measure 310 cm. The height of the wall crest can be estimated to be about 300 cm; this means that the wall crest is about 6 cm below the lintel (8).[10] The lowest openings inside the wall are situated at a height of about 306 cm: No clay wall is visible behind them, but the lintel and other parts of the wooden construction are visible, and a layer of dust and clay modelling covering the wall crest.

The thickness of the wall can be estimated according the dimensions of the stone pillar next to the wall which is 42 cm wide and probably have the same thickness. As the wall (including plaster and modelling) protrudes slightly in the lower part, but recedes about 6 cm in the upper part, the thickness can be calculated to be 30 to maximum 42 cm. A similar result was obtained by measuring the pillar and the brick revetment on the outside.[11]

The moderate thickness of the wall may seem a surprise, but comparable dimensions were measured at the *kongqueling wang* / *yaowang pusa* wall: It is 310 cm wide and 360 cm high, but only 28 to 33 cm thick.

[10] The lowest point behind the mountains to be reached from above is at 200 cm above the floor.

[11] The estimation was based on the following measurements: thickness of pillar including wooden revetment on the outside: 55 cm, brick wall protruding about 4 cm more than the pillar, but receding about 5 cm in the central area. Brick size, probably as measured on other places: 24 x 12x 5 cm, thickness of wall at least 16 cm. Estimation: 55 + 5 – 4 – 16 (thickness of brick revetment) = 38 cm.

Upper part of wall: Support of mountain scenery

Figure 15 shows a schematic view of the construction. Up to the height of 300 cm, the figures and clay modelling are attached to the clay wall. Behind the upper part of the mountain scenery, ca. 306 to 430 cm above the floor, however, there is no clay wall, but the wooden construction. The mountains are modelled over a substructure consisting of reed bundles tied together, and attached by hemp strings to two wooden poles installed horizontally.

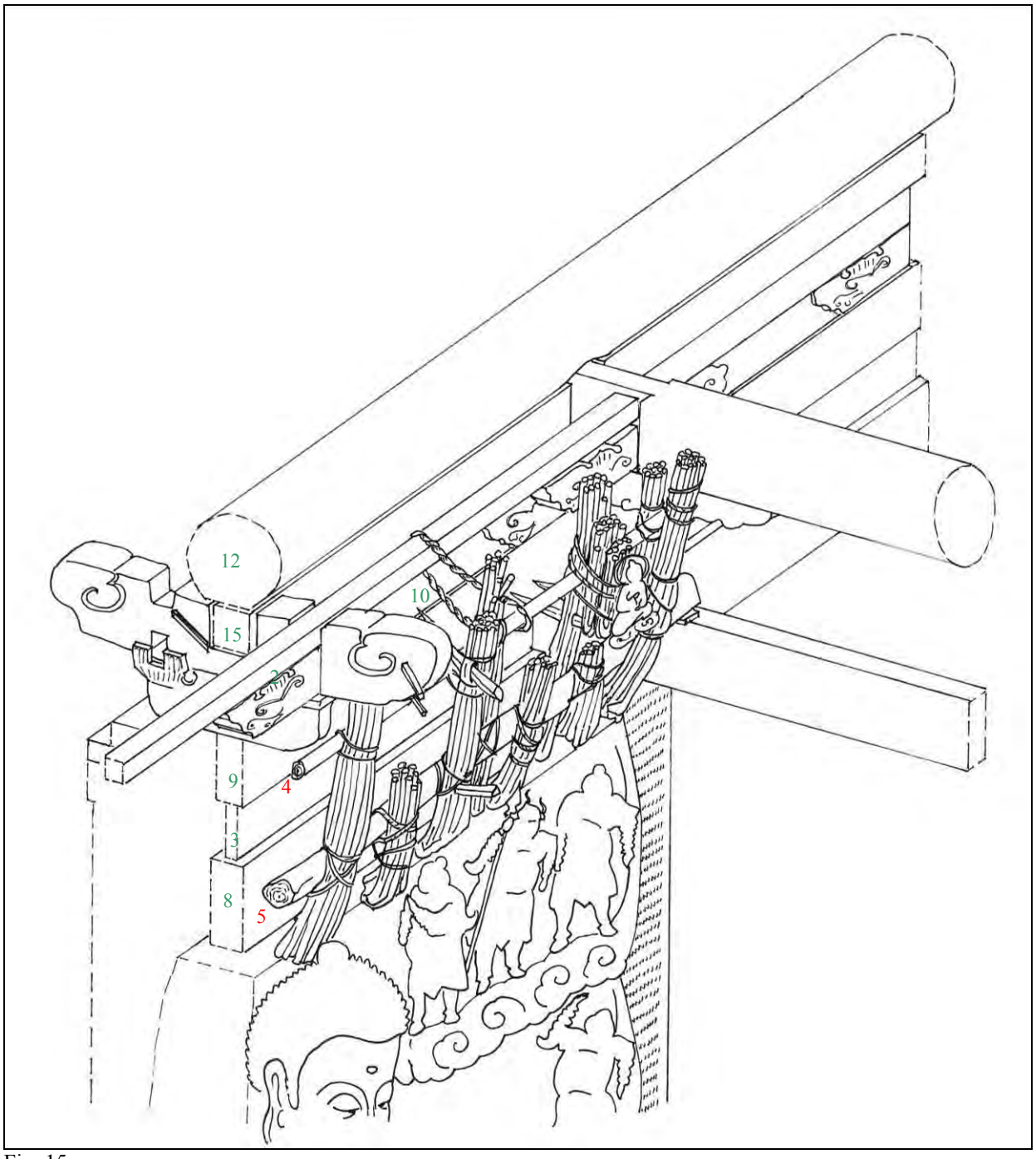


Fig. 15
Schematic drawing of the wall construction with poles (4) and (5) and straw or reed bundles as substructure of the mountain scenery

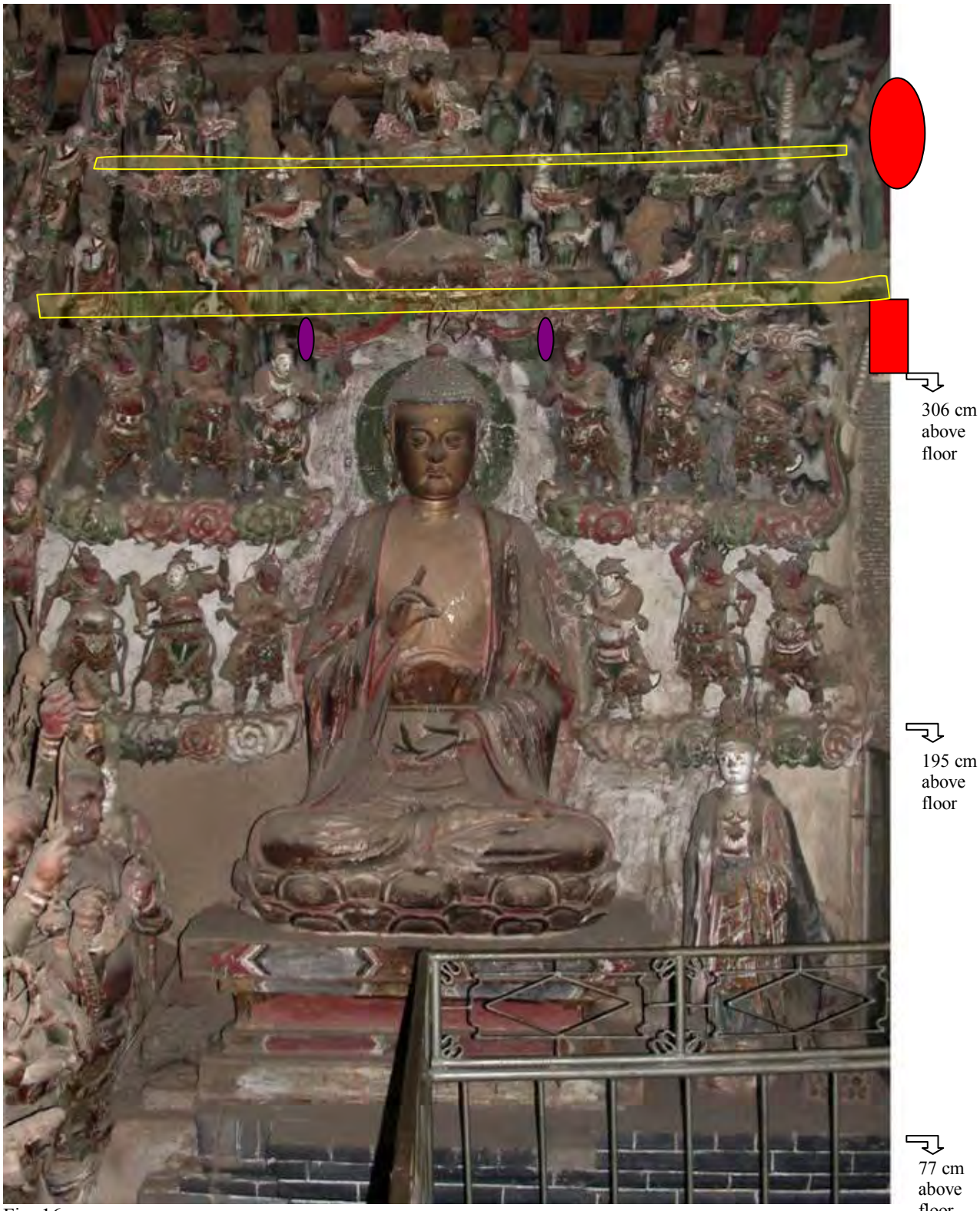


Fig. 16
Yellow: Position of the horizontal poles inside the mountain area (distortion of photograph not corrected; bending of poles not measured). The northern end of the lower pole is hidden inside the northern gable wall.
Red: position of wooden elements in east-west direction
Purple: position of openings in the wall above wall crest
[Photograph by S. Scheder 2001]

Lower and upper pole

The lower pole (5) has the irregular cross section of a thin tree trunk. Its southern end is thicker (12 to 16 cm in diameter) than the northern end where a slightly distorted trunk and cut-off branches are recognisable (fig. 22). The southern end is resting on the lower beam (A) (fig. 21). The northern end disappears out of view in a repaired area of the north gable wall.

The upper pole (4), in cross section is round at its northern end and almost square in the middle (with rounded edges) and rather thin (about 2.5 cm high and 4.5 cm wide). It is without any support. It was a surprising result of the investigation that this situation, apparently rather instable or provisional, is not due to later changes, but belongs to the original construction: The northern end of the pole is sticking inside a mountain (fig. 19) and thus can never have rested on a support; the southern end of the pole crosses the last mountain (S 1 / S 2, fig. 18), but is too short to reach the upper beam in East-West direction (beam B). Furthermore, the pole ends at the side of beam (B), and there is no trace of a support structure connecting it to the beam. Although the pole probably lowered as a result of the tilt of the wall, it cannot have rested on the top side of beam (B) as the beam is located about 20 cm higher. Three hemp ropes, hanging loosely between *fangmu* and parts of the mountains at present, may have belonged to the original fixation of the upper pole to the wall during the modelling of the mountain scenery.[12] Short mountain elements superimposed on the long mountain rocks increase the thickness of the modelling attached to the poles. Figure 16 shows the approximate position of the poles.[13]

The rather instable fixation of the upper pole can be regarded as one of the causes of damage to this wall, for it had the effect that the mountain area tilted and the pole sagged. At the ES wall, both poles are resting on the wooden elements spanning in East-West direction (beams A and B), and their diameter is greater (upper pole: 10 cm, lower pole 15 cm). In addition, iron pins secure them against sliding forward. This may explain why tilting and sagging is by far less noticeable at the ES wall than at the EN wall.

Inner structure of the mountains

Fig. 17
Mountain behind *kongzi*, bundle of reed underneath lost modelling

The mountains are modelled over 21 long bundles of reed (fig. 17), rising vertically and in even distribution from the end of the wall to the top of the mountain area. Only two mountains at the southern end of the wall are arranged in oblique angles (S 2, continuing in S 30 and S 3). Smaller rock elements and shorter mountains are attached to the front side of the long mountains. Some mountains are made of several reed bundles connected with each other in staggered levels (see fig. 24). The reed bundles of the long mountains probably start at the level of the lower pole (in front or behind it). They are affixed in front of the upper pole. Mountains to which figures are attached, are reinforced by an additional reed bundle placed behind the pole:

this can be seen at mountain S 28 behind *kongzi* EN 4.2 (see fig. 29), mountain S 19 and S 20 behind *feitian* EN 4.6, mountain S 9 behind *feitian* EN 4.6 (see fig. 20) and mountain S 6 behind *laozi* EN 4.4. Wooden pegs were used to attach figures or other elements to the

[12] As the ropes are not imbedded into the modeling, it is not sure if they are original or a later addition. Position of the three ropes: at the northern end, around the upper pole and the *fangmu* (see fig. 19); between northern end and corbel bracket, around *fangmu* and a peg; towards the southern edge, around the *fangmu* and torn off below it.

[13] The distortion caused by the photograph could not be corrected. The observed bending of the poles was not measured exactly.

Fig. 18
End of upper pole sticking out of the flank of mountain S 1

Fig. 19
Northern end of upper pole inside the straw bundle of mountain S 23, seen from outside (situation during conservation). S 28 is the mountain behind *kongzi* EN 4.2.

Fig. 20
Upper pole in front of corbel bracket, seen from above. The reed bundles of the mountains are affixed to the pole from the front (S 12, S 10). Mountains to which figures were attached were reinforced by a second bundle of reed affixed behind the pole as mountain S 9 to which the *feitian* EN 4.6 is attached (red arrow = lath of *feitian*).

Fig. 21
Lower pole, southern end. A = beam (A), W = wooden block from 1981-85, P = stone pillar

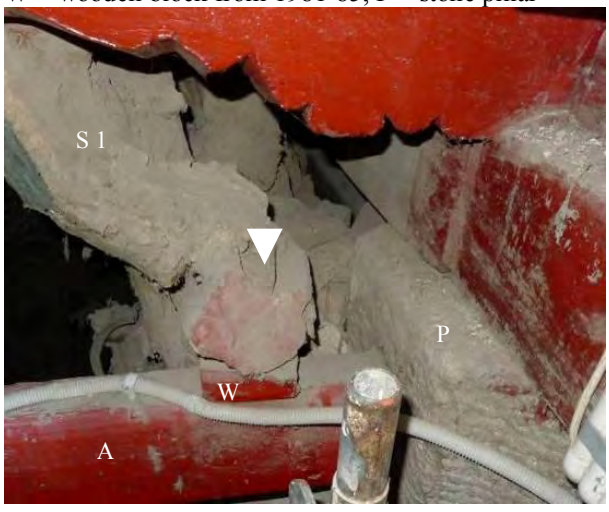
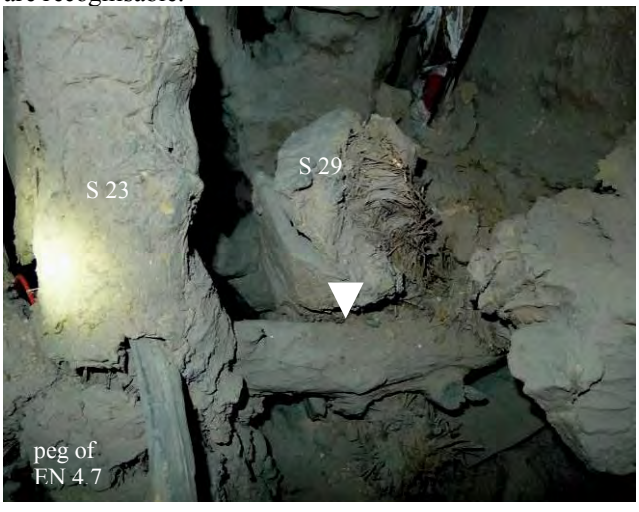
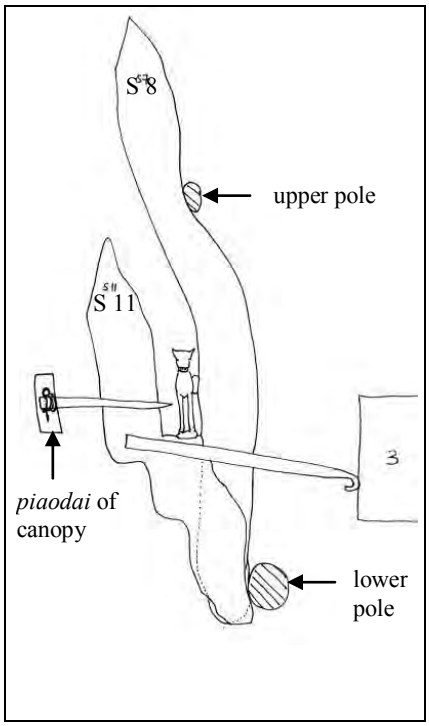


Fig. 22
Lower pole, northern end. The stubs of cut off branches are recognisable.



mountains, and to connect smaller mountains to larger ones. Mountain S 11 is pierced by a wooden peg onto which the right *piaodai* of the canopy is affixed. The peg is short, its tip is visible next to the deer EN 4.B1, on the front side of the mountains. A longer peg which is not visible from the front connects S 11 to S 7 behind. It was so long that the tip was bent when hitting the wooden construction behind (figs. 23 to 25).
There was a wall or some solid material into which they were inserted und which is missing now. The visible traces of modelling, i.e. the clay modelling on the backside of the rock columns and the absence of clay on all wooden parts, however, prove that there never was a wall between mountains and wooden architecture and that the current situation corresponds to the original one.

Fig. 23
View from above behind the mountains. The peg with the bent tip connects mountain S 11 to S 7. Below the mountains straight edges and joints are visible (arrow), maybe from the top layer of adobe bricks.



◀ Fig. 24
Schematic view of S 11 in front of S 7 and fixation with two pegs

▼ Fig. 25
S 11, view from above, arrow: tip of peg

Modelling of the figures

Figures and relief are modelled over a substructure of poles, reed bundles and wire. The substructure was not investigated thoroughly in 2011 except for the mountain scenery, but observations were recorded during the work.
Most figures were modelled on the wall. For this, wooden pegs were driven into the wall to which wooden sticks or bamboo poles were tied by hemp strings. Some figures in the mountain scenery were modelled apart from the wall and attached to it later on. They can be recognised by their flat backside; there is no string connection between peg and bamboo pole.
The orientation of the poles corresponds to the longitudinal direction of the part to be modelled, such as the length axis of a human body, a cloud or a pagoda. Thin, bent elements were modelled over iron wires, such as the flying bands (*piaodai*), strands of hair, decorations on helmets and caps, parts of weapons and attributes. It can be assumed that the cloud ledges possess a substructure maybe made of reed or straw.
The core of the figures was modelled with a straw-clay mixture (*cu ni*). A mixture of clay, hemp fibres and sand was used (*xi ni*) for the surfaces of the figures and the wall. A mixture containing hemp fibres and a low amount of fine sand was used for the mould-made parts. The *baoshen fo* has glass eyes while all other figures have painted eyes. The gilded head of a dragon with a glass eye was found behind *pusa* EN 4.21 (*see: Findings, p. 185-190*). Observations on individual figures and wall parts are described in the following.

Probably the gable wall (GN wall) was decorated first, and then the EN wall was modelled. This assumption is based on the observation that in the corner to the EN wall, the mountains and terraces of the GN wall are modelled up to the edge of the wall, although at least 20 cm were later hidden behind the mountains of the EN wall. This discovery was made when the overlapping of the wall plaster in the corner was investigated.

Figures on the lower part of the wall

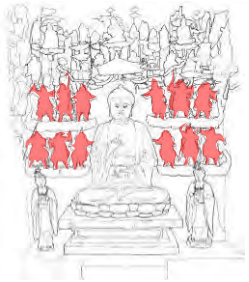
Baoshen fo (EN 4)

The substructures are not visible. It can be assumed that there is a vertical pole (from pedestal or dais up into the head). There probably also is at least one large peg in the back of the sculpture connecting to the wall. The substructure inside each finger probably consisted of thick wire as the broken fingers were slightly flexible.

Pusa (EN 4.21 and EN 4.22)

Inside each figure there is one vertical pole (dais to head). *Pusa* EN 4.22 additionally possesses a large peg that it inserted into his back in an inclined angle and connects the figure to the wall. The peg is concealed inside a mountain modelled behind the figure. An adobe brick and a vertical wooden stick are visible as substructure of the mountain.
Pusa EN 4.21 does not possess this connection to the wall; there also is no mountain. The artisans probably omitted them it because it was difficult to work in the enclosed space of the corner.
The thick vertical pole which became visible below the feet when the statue was lifted in 2012, originally it may have been supported by a stand modelled in clay (F 260) which was found in the debris below the *pusa* though not directly below the pole. The decoration of the crowns was modelled over iron wire (mostly lost today). The attributes in their hands, presumably a twig with leaves and blossoms or fruits, were modelled over a thicker iron wire.

Tianwang (EN 4.9 to EN 4.20)



The substructure is not visible. It can be assumed that two bamboo poles are hidden inside the bodies (feet to body, one continuing into the head). Behind the back of the sculptures, there is a wooden peg connecting the sculptures to the wall. Behind EN 4.13 the peg is visible because around the peg the wall was damaged and the figure has tilted forward. Small wooden sticks are hidden inside the arms. Iron wire was used at the wrists and inside the sleeve tips at the elbows. *Piaodai* around the heads, from shoulder to hip, hanging down from both sides of the hip and in front of the
abdomen, as well as ties and bands were modelled over iron wire. For the decorations of caps (EN 4.9, 4.11, 4.12, 4.14, 4.15, 4.16, 4.18, 4.20), a helmet (EN 4.13), hair strands (EN 4.10 and 4.19) and the sleeve tips of the tunics at the elbows, iron wire was used as well. Loops of iron wire sticking out at bodies and legs indicate elements meanwhile lost. The blades of the swords of EN 4.12 and 4.16 are cut from bamboo slips. The shaft of the spears or halberds of EN 4.10, 4.13 and 4.15 consists of a bamboo pole.

Fig. 26
EN 4.16: Sword cut of bamboo slip and secured to figure with iron wire

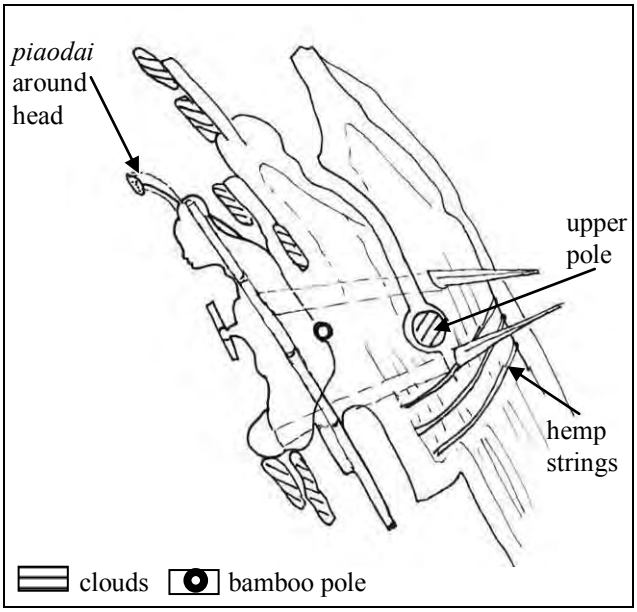


Fig. 27
Kongzi EN 4.2 with double-layered mountain and imbedded clouds

Fig. 28

Fig. 29
Three pegs at the backside of *kongzi* EN 4.2 (before conservation)

Fig. 30
Laozi EN 4.4: Hemp strings connecting three layers of mountain (red arrows); white arrow: wire from 1981-85

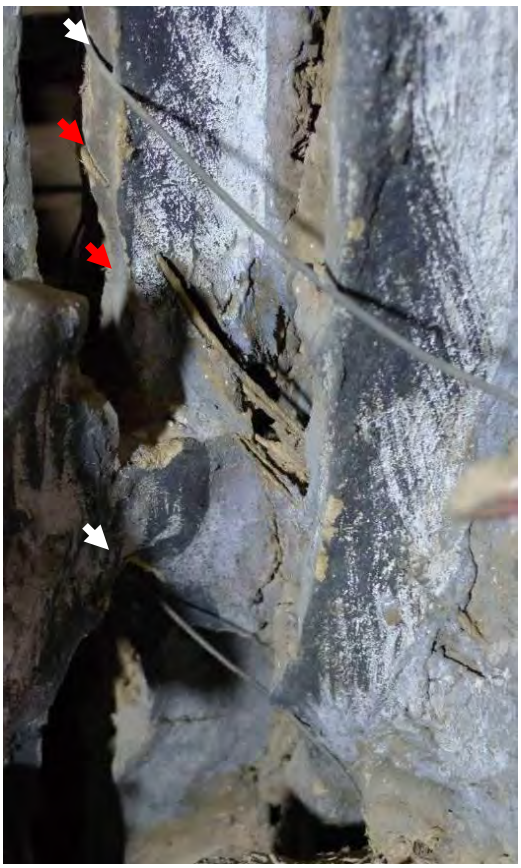
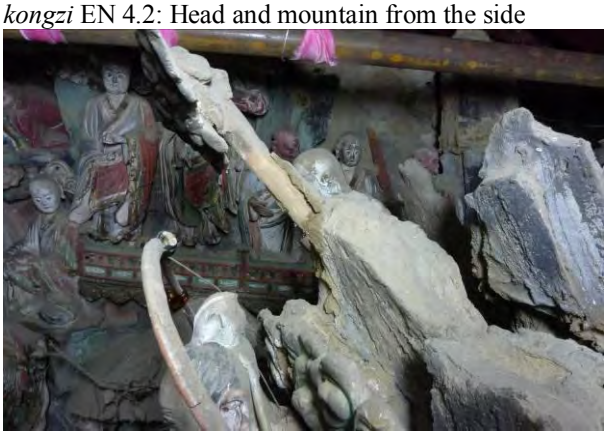
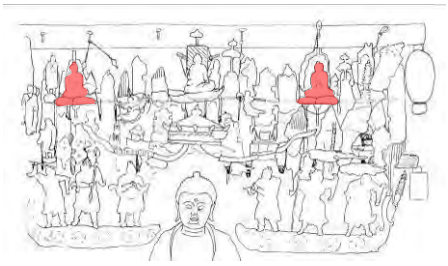


Fig. 31
kongzi EN 4.2: Head and mountain from the side



Figures and elements in the mountain scenery in the upper part of the wall

Kongzi (EN 4.2) and *laozi* (EN 4.4)



The two figures of philosophers, sitting in "lotus position" (*ardhapadmāsana*), are placed in front of mountains. Behind *kongzi* EN 4.2, there are two layers of mountains, one superimposed on the other; behind *laozi* EN 4.4, there are three layers. Clouds are placed at five levels: behind and above the heads, next to the shoulders, at the level of the thighs and below the legs.

The substructure consists of a vertical bamboo pole in the centre of the figures (from between the legs to the head). It juts out below both figures and is visible today. Behind *kongzi* EN 4.2, three pegs protrude from the back of the mountain, two below and one above the upper pole (fig. 29). It can be assumed that the pegs connect the figure to the mountain, the lower pegs probably ending inside the knees, the upper one probably in the back of the figure.

The manufacture process can be reconstructed tentatively. The schematic structure is shown in fig. 27. A long reed bundle was placed behind the upper pole to form the rear part of the double mountain. A shorter reed bundle was placed in front of it and in front of the upper pole. The two reed bundles were connected and stabilised by tying them together by hemp strings. The hemp strings are still visible on the sides of the mountains behind *laozi* EN 4.4 (fig. 30). As support for the figure, three pegs were driven through the reed bundles. A vertical bamboo pole was tied to the pegs; it served as axis inside the body. A horizontal bamboo pole was inserted between mountain and figure as support for the clouds; it is sticking out at the level of the thighs. A wooden stick was inserted into the front mountain to attach the two clouds above the heads of the figures. The clouds were made in moulds. The clouds next to the body were cut off in order to adjust them to the outline of the figure (fig. 33).

Piaodai were modelled over iron wires. The ring-shaped *piaodai* around the head of *kongzi* (EN 4.2) is supported by an additional wire sticking up from the head of the figure. The shape of the *piaodai* hanging down at the sides of the figures cannot be reconstructed because the only elements preserved are fragments of wire. The mould-made hands of the figures are attached to the arms (inserted into the sleeves) by wire.

Fig. 32
Kongzi, *piaodai* around head, substructure with iron wire and original support wire in the middle (during conservation)

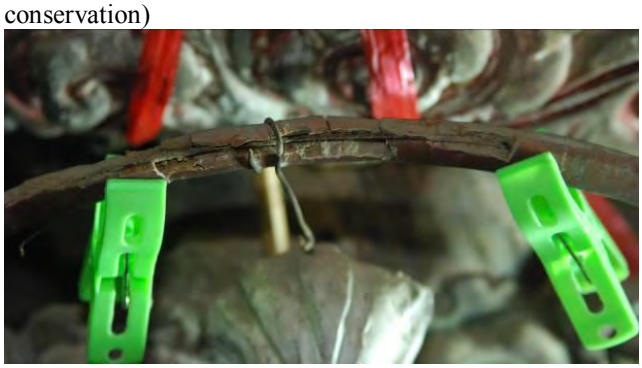


Fig. 33
Laozi EN 4.4: Cut-off cloud behind the head

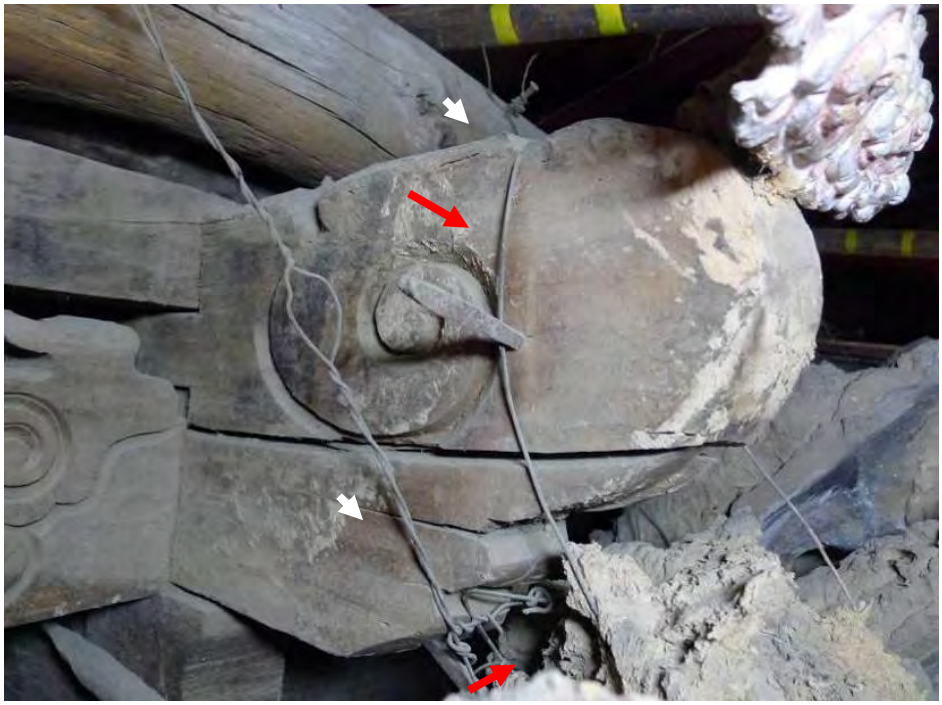
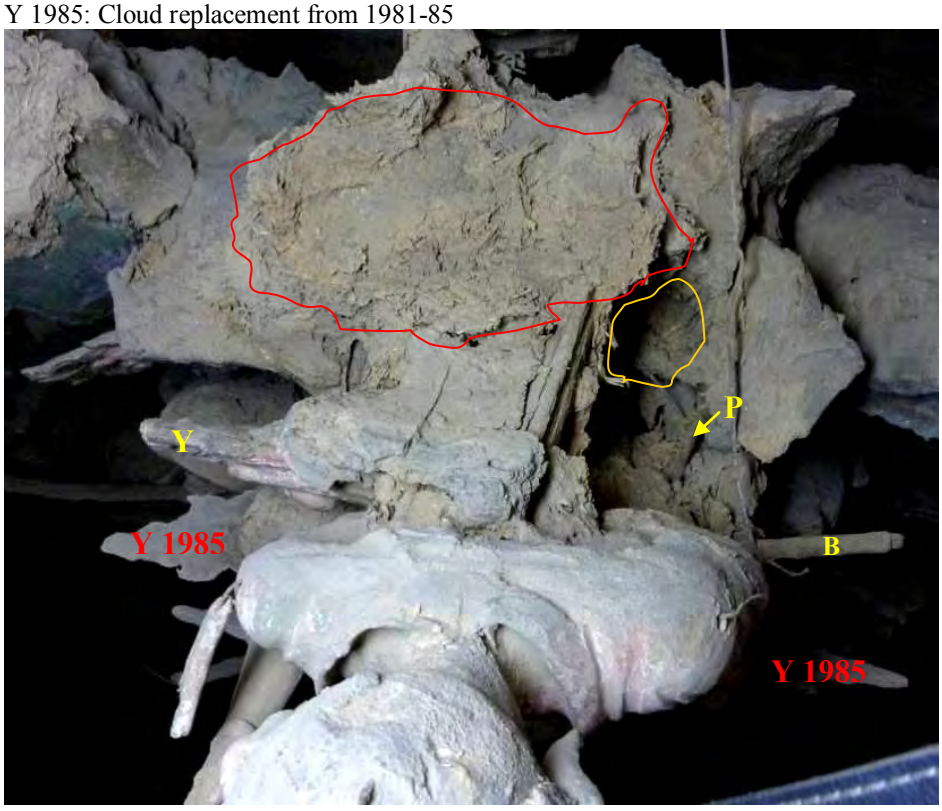
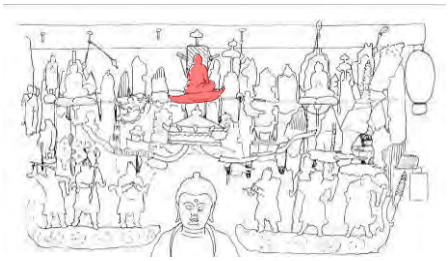


Fig. 34
Corbel bracket behind *shijiamouni* EN 4.3 (before conservation)
White arrows: Splashes of clay from original modelling of the background
Red arrows: original iron pins

Fig. 35
View behind *shijiamouni* EN 4.3 from above, after removal of mountain and clouds
P: peg
Y: original cloud
B: Bamboo pole from lost cloud
Yellow line: Outline of reed bundle inside a lost mountain
Red line: clay straw mixture added in 1981-85
Y 1985: Cloud replacement from 1981-85



Shijiamouni (EN 4.3)



The *shijiamouni* (EN 4.3) is modelled similarly to *kongzi* (EN 4.2) and *laozi* (EN 4.4), but with a different background, probably because the corbel bracket is concealed behind the figure. The original modelling behind the *shijiamouni* is lost. In 1981-85, a new background was created using two fragments of mountains and five fragments of clouds (fig. 191-195). None of the mountains and the removal of four clouds and the two mountain fragments, traces of the original structure became visible. They prove that the figure was modelled on the wall. Three pegs, one in the back and two in the knees, connect the sculpture to the wall. The tip of the peg in the back is turned to the right, probably to avoid hitting the corbel bracket behind. The peg is rather short. A vertical bamboo pole is tied to this peg, serving as axis of the body. The pegs in the knees are very long. They pierce the mountains and stick out below the upper pole to the left and to the right of the corbel bracket.

Originally there were to mountain peaks rising left and right behind the figure of *shijiamouni*: On the right side, there is the imprint of a reed bundle which shows that there had been a mountain peak behind the left shoulder of the *shijiamouni*. Hemp strings are preserved by which the reed inside the lost mountain had been tied together and probably connected with the upper pole. The area behind the right shoulder of the figure is covered in a layer of repair plaster from 1981-85, so traces of the original modelling are not visible. For reasons of symmetry it can be assumed that originally there was a mountain peak as well. The modelled surface behind the back of the *shijiamouni* shows that the mountain peaks were not directly attached to his shoulders as in the case of *laozi* EN 4.2 and *kongzi* EN 4.4, but that there was a recession between figure and mountains (distance between back of figure and reed bundle of former mountain: 10 cm). Vertical bamboo poles behind the elbow and underneath the knees probably served as support of clouds (for a tentative reconstruction see fig. 202). There are splashes of clay on the sides of the corbel bracket which do not originate from the 1981-85 restoration. They imply that the corbel bracket was originally surrounded by the modelling behind the *shijiamouni*. Three iron pins with rectangular cross section (8 x 8 mm), on both sides and the lower side of the front, may also have served as fixation of the modelling although it is not clear how (fig. 34, red arrows). The two iron pins at the side of the corbel bracket are about 10 cm long. The upper pole is located ca. 3 cm below the iron pin at the lower side of the bracket. Directly opposite this iron pin, an iron nail is driven through the upper pole from below. It may originally have served to attach the upper pole to the corbel bracket. A nail hole inside the corbel bracket could not be detected, but the lower side of the bracket arm is only partly visible.

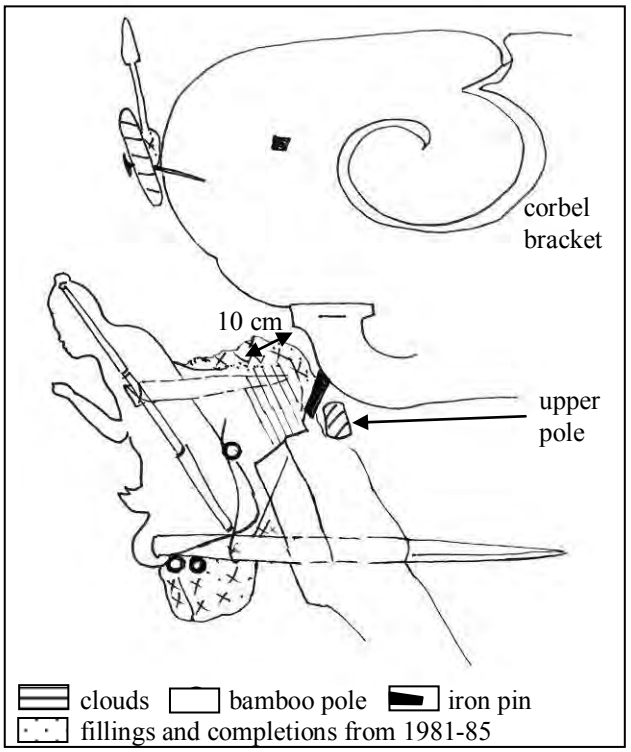


Fig. 36
Section through *shijiamouni* EN 4.3, current situation after removal of three clouds and two mountain elements pasted together as background in the restoration of 1981-85

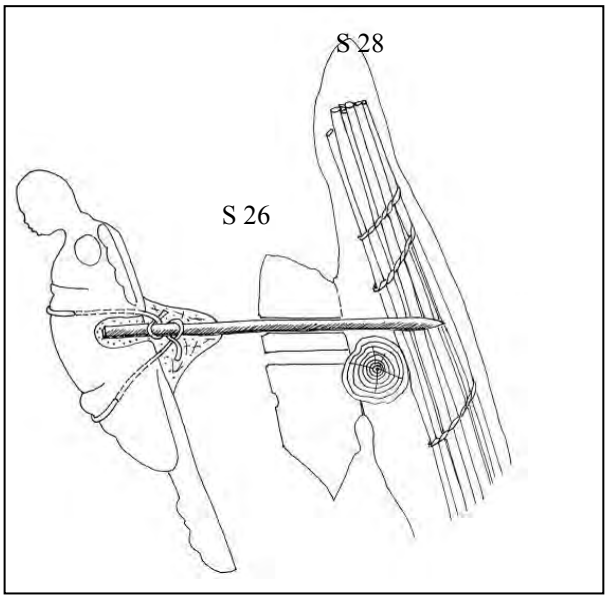


Fig. 37
Tentative reconstruction of the mounting of *feitian* EN 4.5

Fig. 38
Small figure from middle wall (28 cm without head) mounted on iron pin (protruding 20 cm)

Fig. 39
Figure in the aureole of *shijiamouni* at the middle wall, 32 cm high, mounted on iron pins in the back and at the feet [Gao Yan, Shaanxi Institute for Conservation]

Fig. 40
Aureole of *amitou fo*, middle wall: Iron pin of a lost figure with clay lump
[Gao Yan, Shaanxi Institute for Conservation]

Feitian (EN 4.5 and 4.6)

The *feitian* were modelled apart from the wall, lying on a flat surface. Thin bamboo poles or twigs form the core of both heads. Iron wire has been observed inside the wrists, the elbows, the protruding pinion feathers and the *piaodai*. Originally there were *piaodai* around the heads, from shoulder to hip and from the hips floating downwards (fig. 41). The *piaodai* of EN 4.6 are green, the ones of EN 4.5 were either dark red or golden (now appearing brownish).

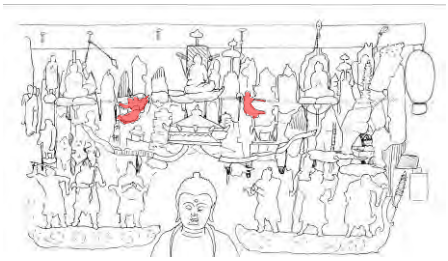


Fig. 41
Feitian EN 4.5 After conservation and virtual reconstruction of missing feathers, missing cloud tip and lost *piaodai* (right side). White lines: wires for fixation of the *feitian* to the wall

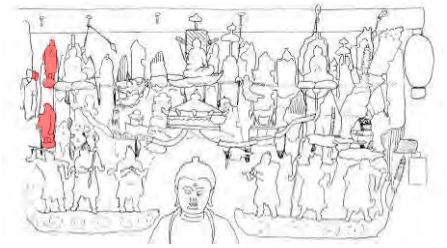
In 1981-85 the mounting was of the *feitian* was renewed (see below: *damages*, p. 70-71 and *conservation treatment,* pp. 102). The preserved traces of the original mounting are a rather large hole in their back and two holes with rectangular cross section in the mountain of 8 x 8 mm in the mountain S 28 behind *feitian* EN 4.5 (fig. 46).

Small figures and elements (humans, animals and pagodas; up to 32 cm high), mounted in front of the aureoles of the three large statues in front of the middle wall (fig. 39) and onto the terraces of the gable walls[14] are attached in way that seems comparable way to the *feitian*: They also have a rather large hole in the back. A pointed iron pin with a rectangular cross-section of about 5-6 x 5-6 mm to 8 x 8 mm was inserted into the hole and stabilised by imbedding it into a lump of fresh clay which filled the hole, overlapped on the back of the figure and was also modelled around the pin to increase the stability. Different from the wooden pegs, the iron pins are inserted vertically or just slightly pointing upwards and sometimes protrude far from the wall (up to 25 cm, see fig. 38 to 40).

At *feitian* EN 4.5, the lower hole may have been a fruitless attempt to pierce the mountain, hitting the upper pole. The upper hole is pierced at least 13 cm deep into the double-layered mountain. Thus the original fixation device pierced the front part of the mountain and ended in the more stable rear mountain (both mountain parts together are 22 cm deep). The original position of the *feitian* can be deduced from areas which remained unpainted behind the figure. Like in the case of the small figures on the middle and the gable walls, the iron pin had probably been inserted vertically. Two wires pierced through the fresh clay at the level of the chest and at the upper hem of the skirt of the *feitian* (fig. 41: white lines) probably served as a fixation of the figures to the mounting device, in order to prevent them from sliding down. The small figures on the middle wall and the GN wall do not show a fixation with wires.

[14] Figures mounted in front of the lotus flower ring of the aureoles of *shijiamouni* and *yaowang fo*, some of them detached, others preserved in their original position.

Monks (EN 4.1, EN 4.7, GN 7.19a and GN 7.19b)



The four figures of monks were modelled apart from the wall and attached to the mountains finished beforehand. The flat back of the figures shows that they were modelled lying on a support like a wooden board (fig. 42 and 43).
Between the legs of monk EN 4.1, a peg is visible, attaching the figure (together with the cloud) to the mountain. There probably is another one in the back of the figure. Both do not stick out at the back of the mountain.
Monk EN 4.7, with a robe ending above his ankles, has a core of two bamboo poles, extending from both feet into the body, one of them continuing into the head. A hole was dug into his back in order to insert a peg into the back, but there is no connection of the peg to the bamboo poles. The mould-made hands were connected to the sleeves by wire.
The monks GN 7.19a and GN 7.19b were discovered during the conservation work of 2011. They are standing in the corner between the EN wall and the GN wall and are almost invisible because of the tilted mountain S 23. The fact that both figures are painted and gilded proves that originally they must have been visible from below. They are standing on a rock ledge modelled on the GN wall and they are attached to the GN wall with pegs in their backs. GN 7.19b was attached with the left foot to the short mountain S 29 which is situated next to S 23 on the EN wall. In order to conserve mountain S 29, monk GN 7.19b had to be removed. He could not be brought back to his original place without adjusting the position of monk GN 7.19a, because both figures are made suitable for nestling up to each other. For this reason, monks EN 4.1 and EN 4.2 were included in the conservation work.

Fig. 42
Monk EN 4.1 seen from top: flat surface of the back from modelling on a support

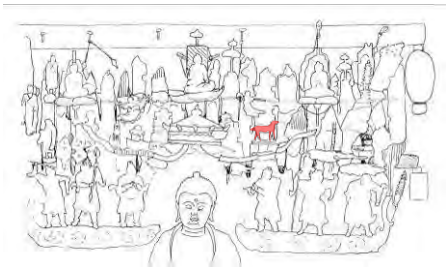
Fig. 43
Monk GN 7.19a, after removing GN 7.19b. The flat back is visible. The dints in the background show that the mountains had been modelled before the monks were inserted. The wooden peg (center of the photograh) originally held an element which is lost today.

The monks GN 7.19 a and b (44.5 cm high, max. 18 cm wide) wear a floor-long robe. GN 7.19b was detached in 2011 and thus could be examined from the back: There is a bamboo pole sticking out 9 cm below the feet. It does not continue into the head, but probably it is attached to one or two other poles inside the body. The backs of the figures are flat (fig. 43). This shows that they were modelled apart from the wall. In the centre of the backside there is a hole to insert the peg by which the figure was attached to the wall. The hole is rounded and hand-made; like with the *feitian*, it is not the imprint of a peg. Inside this hole, the bamboo

pole(s) are not visible and there are no hemp strings to connect the peg to the poles. Behind the monks, the wall surface is decorated with rows of small dints indicating mountains (fig. 43). This proves that the mountains had been modelled finely before the monks were attached (the decorative dints are concealed nowadays behind the figures).
There are two holes behind figure GN 7.19b. A wooden peg was sticking in one of them, but the position was unsuited to support the figure. The wood used for the peg is not Smoke tree.
The left and the right side of GN 7.19b are not completely painted (left shoe and lowest part of the robe on the left side, right elbow). This means that both sides were originally concealed behind other elements of the wall. At present, the right arm is hidden behind GN 7.19a, but there is nothing in front of the left side. Originally there was something that concealed these parts of the monk. The lost element had been attached by a peg and continued the modelling of the mountain (fig. 43, centre).

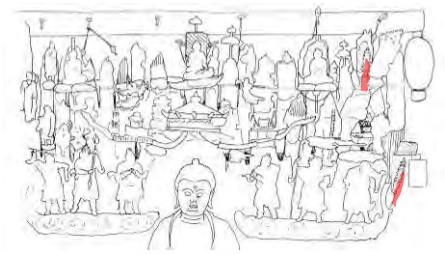
Deer (EN 4.B1)

No substructure is visible on the deer. Probably bamboo poles or wooden sticks are hidden inside the legs. The ledge-shaped element below its feet is probably part of the modelled animal. A very thin wire protrudes from the mouth: maybe the deer was holding something between the teeth.



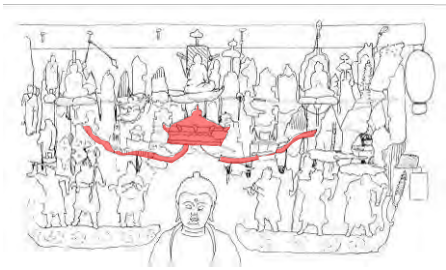
Pagodas (EN T1 and T2)

A vertical bamboo pole is running from the base to the tip.



Canopy EN 4.A1 with piaodai

The construction of the canopy above the head of the *baoshen fo* is probably similar to that of the destroyed canopy of the *kongqueling wang* (*see: Report 2010*). The substructure is hidden inside the red ring and may consist of thin bent bamboo poles tied together with hemp string. The ring is supported and connected to the wall by two wooden pegs (fig. 44). Below the ring, there is a hanging drapery made of clay. Gilded ornaments were attached above and below the ring. They consist of eave-tile-shaped ornaments made in moulds (five "eave-tiles" in each section) A woven mat was used as substructure of the cover. It still can be seen from underneath behind two clouds placed onto the supporting pegs (fig. 44 and 48). A thick wooden stick forms the spine in the centre of the cover. The mat is tied to the stick with hemp strings.



The canopy is attached to the wall above the lower pole. This means that it is hanging on three wooden pegs pierced through bundles of reed, but has no attachment to the solid wall.
The five arms protruding from the ring possess a substructure of thick wire. A thinner wire connects the central arm with the support of the cover and the adjacent arms, probably to prevent the arms from bending down under the weight of the bead chains attached to them. The bead chains consist of thin iron wire on which clay beads and decorative elements are pierced. The chains were hanging from loops of iron wire sticking out at the end of the arms.

The chains were connected to each other with loops at the end of each wire element. Most of the bead chain curtain is lost today (fig. 46). Numerous broken beads, fragments of chains and some decorative elements (rosettes, "clouds of happiness" and pendants) were found next to *pusa* EN 4.21 in 2011 and 2012 and catalogued as findings (fig. 46).[15]
Two red *piaodai* unfold from underneath the canopy to both sides. The substructure is a thick wire. Each *piaodai* was attached to two wooden pegs by a hemp string wound around the peg and the wire. The pegs originally were hidden inside modelled mountains (fig. 45 and 49).

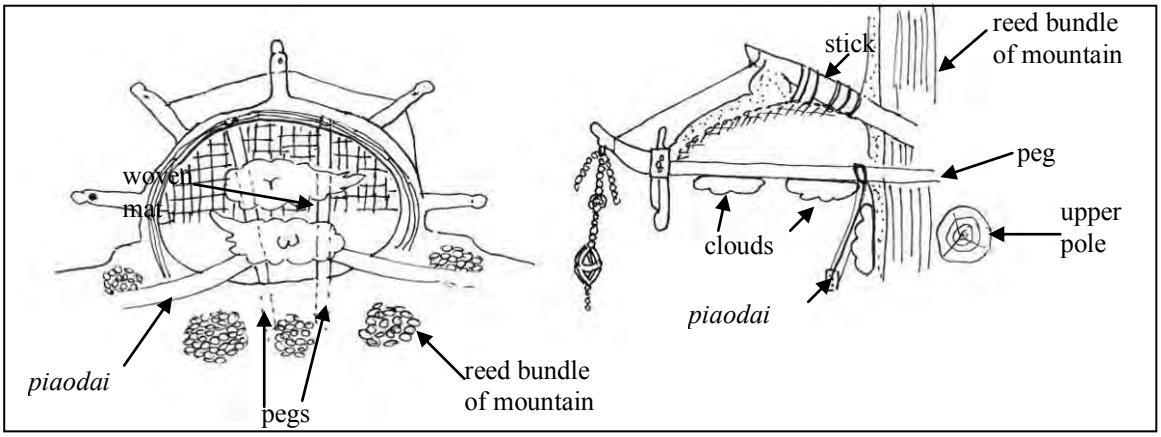


Fig. 44
Schematic drawing of canopy: View from underneath and section

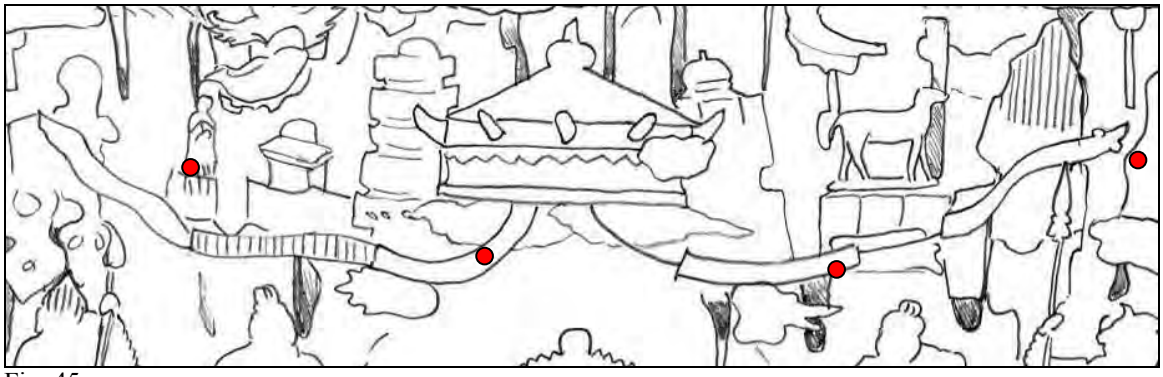


Fig. 45
Piaodai of canopy. Position of pegs for attaching the *piaodai* to the wall.

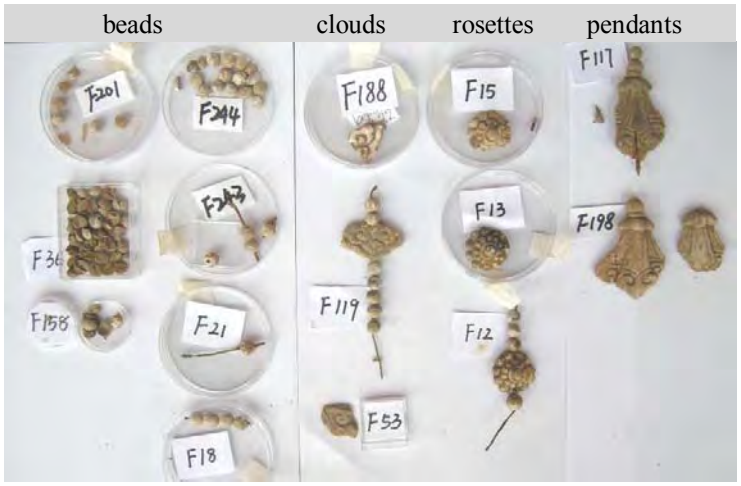


Fig. 46
Most of the fragments of the bead chain pendants of the canopy recovered from the floor and the debris of the broken dais around EN 4.21 in 2011 and 2012
(F 13 is a decoration of a figure (belt of *tianwang*); the fragments of beads F 104, 106, 107, 162, 214 and 242 are not included in the photograph)

[15] Findings belonging to a beaded chain curtain: Beads with fragment of wire F 18, 21, 166, 243; beads, partly broken, collected in groups: F 36, 104, 106, 107, 158, 162, 201, 214, 242, 244; pendants: F 177, 198; "clouds": F 53, 119, 188; rosettes: F 12, 15. The rosette F 13 is slightly bigger in diameter (2.5 cm instead of 2.2 cm) and not pierced. It could be identified as decoration of a belt of a *tianwang* on the EN wall.

Fig. 47
Canopy (after conservation)

Fig. 48
Canopy from underneath (before conservation)

Fig. 49
Peg of right *piaodai* hidden inside mountain S 11 (before conservation)

Clouds (Y5 to Y16)
Most of the clouds were reinforced by means of a thin bamboo pole which runs vertically along their longest elongation. In case of the cloud behind the arms of *laozi* EN 4.4, a wire was used for this purpose. The bamboo pole and the wire were probably imbedded during the making of the clouds. The clouds used behind *kongzi* (EN 4.2), *shijiamouni* (EN 4.3) and *laozi* (EN 4.4) were attached in front of a bamboo pole in order to increase their stability. These kinds of stabilisation have not been observed with other clouds before.

Trees
The trees are approximately 24 cm high. They were made with moulds. The preserved trees differ slightly in shape and height, showing that the soft, freshly produced elements could be adjusted according to the needs. Inside the tree trunk, there is a very thin bamboo pole or a wooden twig. It protrudes at the lower end. The trees were attached to the mountains by piercing the twig or bamboo pole into the mountain.

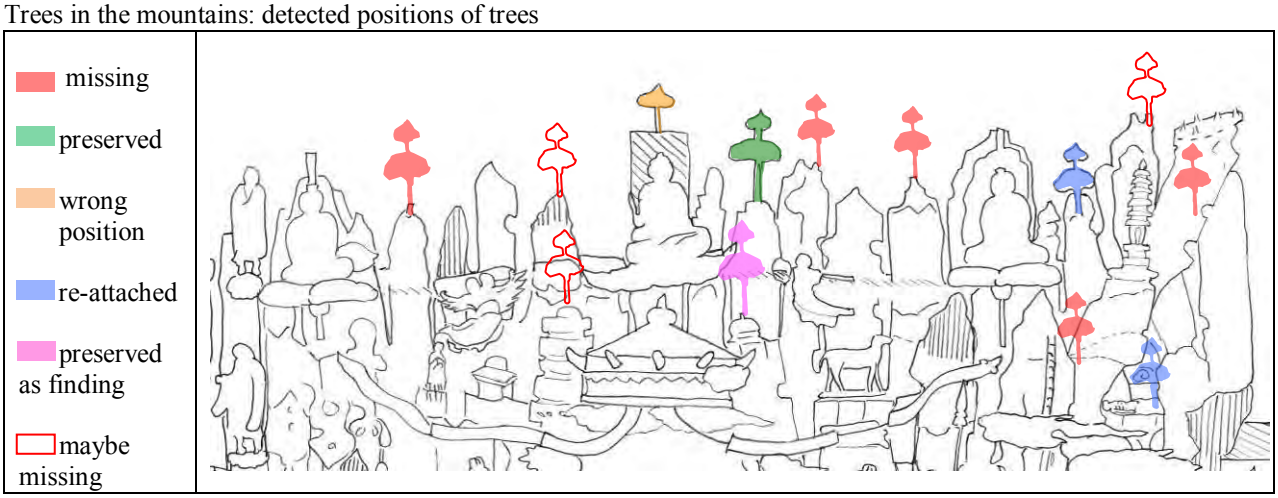
Tree F 130 from mountain S 4

Fragmented tree F 96 from cave of EN 4.23

Fragmented tree F 93, probably from mountain below *shijiamouni*

Fig. 50
Three trees found in front of the EN wall

Fig. 51
Trees in the mountains: detected positions of trees



Originally the trees in the mountains gave the impression of a sylvan landscape instead of the scanty rock visible today. The positions of nine missing trees could be identified, most of them in the southern part of the wall. Three more trees may have been positioned on mountain tops which are damaged today (fig. 51, red outline). Most of the fragile tress got lost: Only one of them was preserved on the wall in 2011 (on peak of mountain S 10, fig. 51: green). Two trees were found in the debris at the foot of the wall could be re-attached (fig. 51: blue): F 130 could be identified to belong on mountain S 4, F 96 to a small cave, at the feet of the corpse EN 4.23. A fragmented tree coming from an unknown place is nailed to the corbel bracket as background decoration of the *shijiamouni* (fig. 51: orange). Two more trees have been found in the debris around EN 4.21 (tree F 96 and F 93, fig. 50).

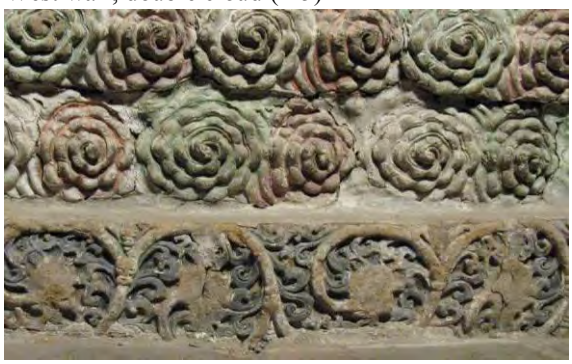
PK

Kongqueling wang wall, W 9.41, double cloud

Kongqueling wang, lotus flower frieze, cloud ledge

W

West wall, double cloud (F 5)



West wall, lotus flower frieze and cloud ledge

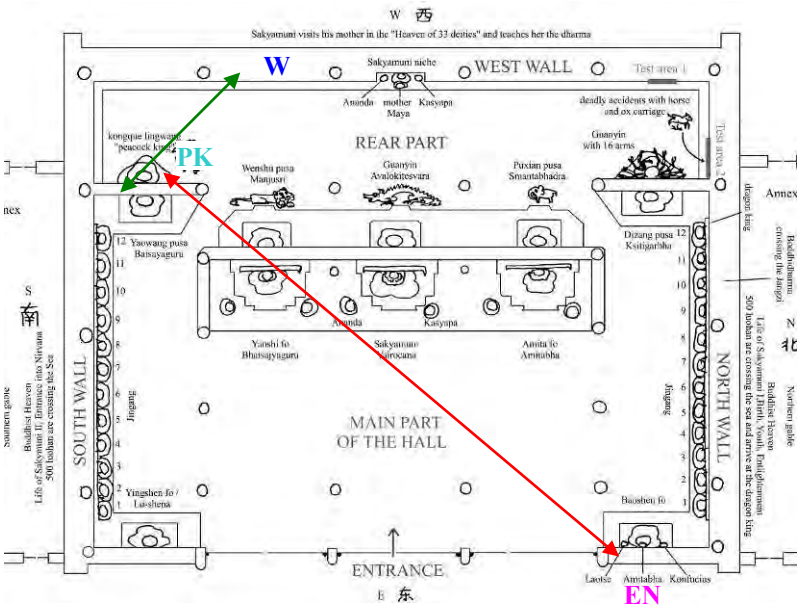


Fig. 52
Comparison of cloud types between:
- west wall (W)
- *kongqueling wang* wall (PK)
- east wall, northern part (EN)

⟷ the same type of double clouds and lotus flower frieze

⟷ the same type of clouds in the upper parts of the walls

Kongqueling wang wall, cloud below PK 9.3 (shown upside down)

EN wall, Y 6
[Shaanxi Institute for Conservation, 2011]

PK

EN

Observations on mould-made parts

As on the west wall and the southern partition wall, various parts of the figures and the decoration were produced in moulds. There was no detailed investigation during the conservation work in 2011 and 2012, but several parts could be identified as being mould-made:
- Hands, faces and ears of monks: hands of *kongzi* and *laozi*
- faces of twelve *tianwang*
- forearms, parts of suit of armour and feet of the *tianwang*
- decorative elements of the bead chains of the canopy and the crowns of the *pusa*
- trees
- clouds

All clouds were made in the same mould. Partly they were cut afterwards to obtain smaller units. A comparison of clouds in the Shuilu hall (fig. 52) revealed that the same mould was used to make the clouds in the lower parts of the *kongqueling wang* wall and the ones on the west wall (double clouds measuring 20-21 cm in length without tail, 27 cm with tail and 9-10 cm high). This means that the west wall and the *kongqueling wang* wall were made at the same time.
The clouds used in the upper part of the *kongqueling wang* wall, i.e. the mountain scenery, are of a different type. The same kind of cloud was applied on the EN wall (full length 43 cm). This indicates that the EN wall was made at the same time as the *kongqueling wang* wall. Consequently the west wall, still presented as originating from the Tang Dynasty, dates from the same time as the east wall, northern part (EN wall). Despite of all stylistic differences, this implies that all the sculptures and reliefs in the Shuilu hall date from the Ming Dynasty.

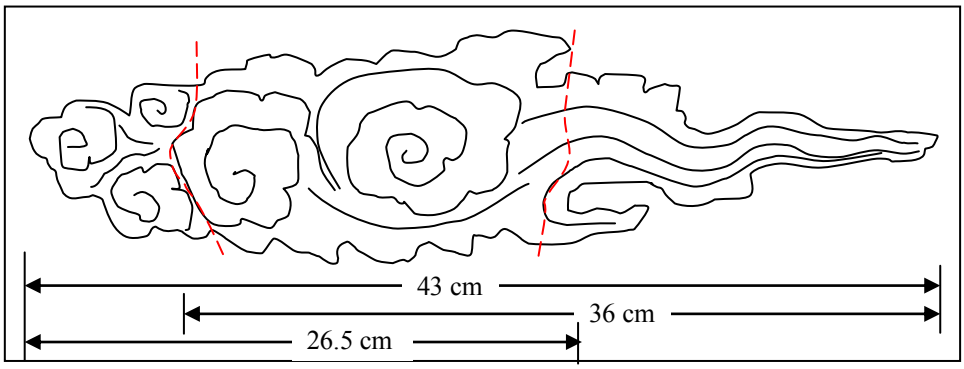


Fig. 53
Mould-made clouds used on the *kongqueling wang* wall, mountain scenery, and on the EN wall; dimensions of the complete clouds and typical cut-off parts used on both walls.

Fig. 54
View behind the mountains from the southern end of the wall, before conservation.
The wire fixation from 1981-85 with the typical twisted wires is visible. At the upper edge of the picture, corbel bracket with *shijiamouni* EN 4.3

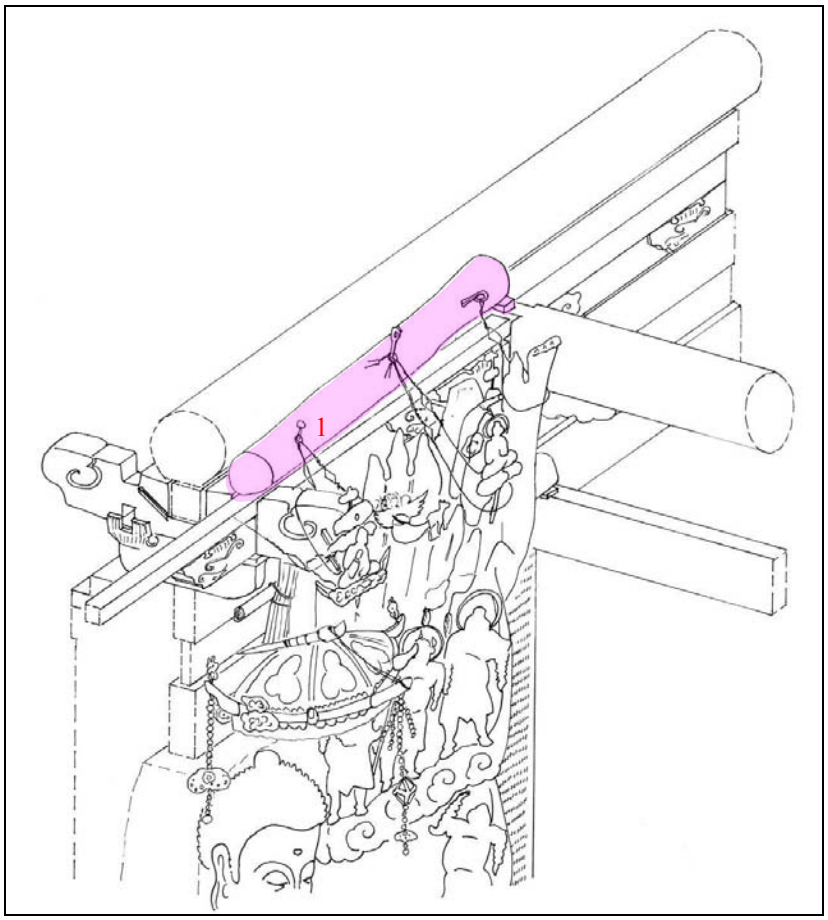


Fig. 55
1981-85: Upper part of the wall, with mountain scenery, stabilised with inserted beam (marked pink).

PREVIOUS REPAIRS

The interventions can be classified into different measures:
I. Fixation of the mountain scenery to the wooden construction
II. Re-attachment and remodelling
- Re-attachment of loose elements
- Completions and remodelling of lost parts
- Completion of lost plaster surfaces of the wall
III. Revetment of the dais with fired bricks

Repairs and replacements were carried out using different types of plasters, but probably most of them can be assigned to the renovation during 1981-85.[16] On the hands of the *baoshen fo* and the *pusa* EN 4.22, repairs with completions and repainting of the surfaces were detected which probably date from another time, because usually no retouching or repainting was done in 1981-85.

I. Fixation of the mountain scenery to the wooden construction (1981-85)

The upper part of the wall with the mountain scenery had already revealed problems of sagging and tilting forward when the restoration started in 1981. To prevent further movement involving the detachment of sculptures, a wooden beam was inserted on top of the *fangmu*, thus lying in front of the purlin. The beam measures about 16 cm in diameter (fig. 55: (1), pink). It was probably inserted from the above during the time when the roof and the rafters had been removed to be replaced.
Six iron rods or bigger nails were driven into the new beam at approximately even distances. Wire was carried around the upper pole, two mountains (S 2/S 3 and tip of S 23) and the figures of *kongzi*, *shijiamouni* and *laozi*, and tied to the rods or nails. The approx. 2 mm thick and stiff wire was twisted in order to tighten it. The positions of the nails and wires are shown in fig. 56 and described in table 6.

In 1981-85, the lower pole was supported at the ends to prevent further sliding forward and tilting: Its southern end is now disappearing inside a repaired part of the wall. The type of support is not visible, but the position is fixed. The northern end was supported by a wooden block inserted between the pole and beam (A) (fig. 56, green).
The fracture edges of the cracks inside the mountains are out of alignment. Normally the upper part protrudes in front of the lower part in consequence of the tilt of the mountains. At the southern end, at the crack below the corpse EN 4.23, however, the part of the mountain below the crack protrudes while the part above recedes. This probably indicates that the mountain part above EN 4.23 was pulled or pushed backwards. This may have been done by inserting a wooden spacer block (fig. 56, pink) below the new beam and driving it in with increased force (for example hammer blows).

[16] For the dating of previous repairs see: *Report 2010*, p. 43.

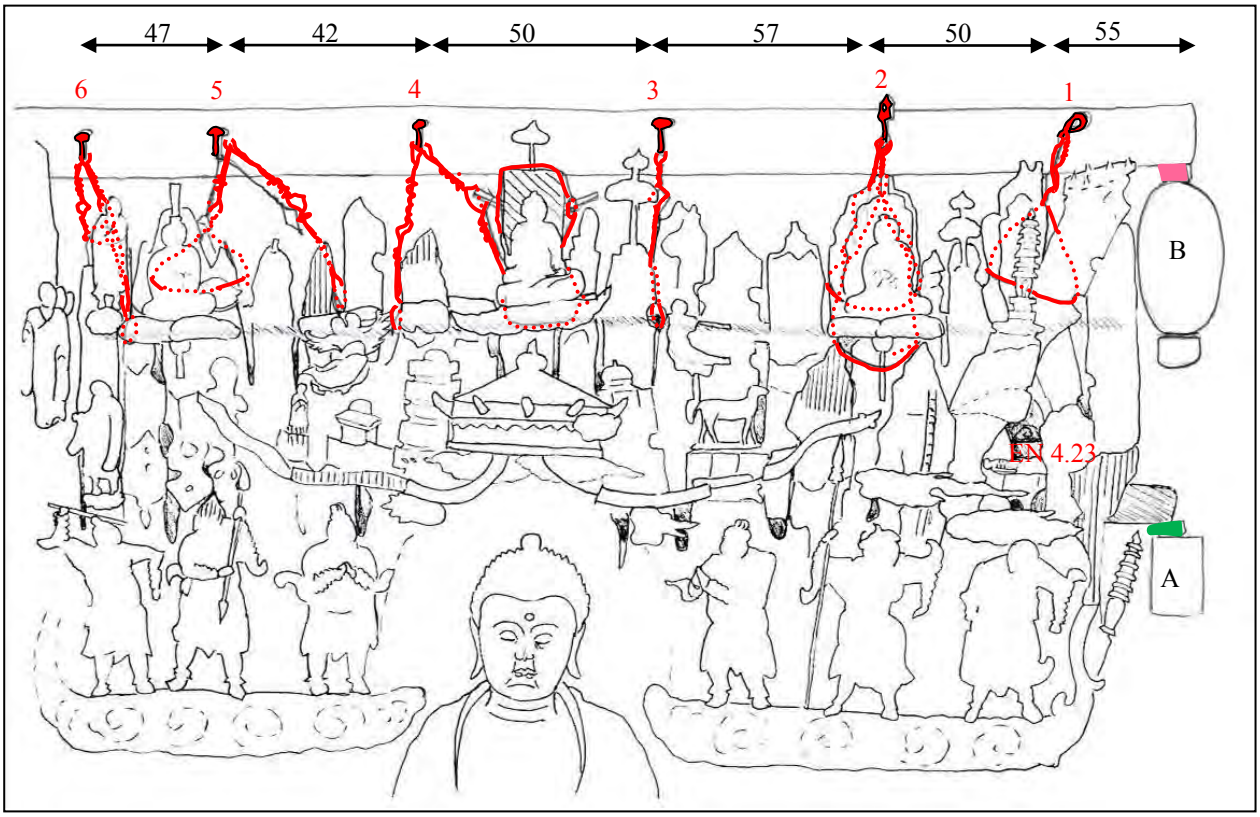


Fig. 56
Restoration in 1981-85: Positions of wires and nails (red); spacer block below ne beam (pink); support block for lower pole (green arrow). Sketch of wall not in scale.

Tab. 6
Method and type of wire fixations from 1981-85

Number of fixation device	*fixation device on new beam*	*wire fixation*
1	rod with eye	around mountains S 1 and S 2
2	rod with hole at the end	around mountains and through a hole drilled through the back of *laozi* EN 4.4 and around mountain below *laozi* and below the upper pole
3	nail	around upper pole between mountains S 9 and S 10 (behind *feitian* EN 4.6)
around corbel bracket		behind back of *shijiamouni* EN 4.3
4	nail	- around mountains and behind back of *shijiamouni* EN 4.3 - around upper pole between mountains S 17 and 18
5	nail	- around upper pole between mountains S 19 and 20 (behind *feitian* EN 4.5) - around mountains; through a hole drilled through the back of *kongzi* EN 4.2
6	nail	around upper pole

II. Reattachment and remodelling

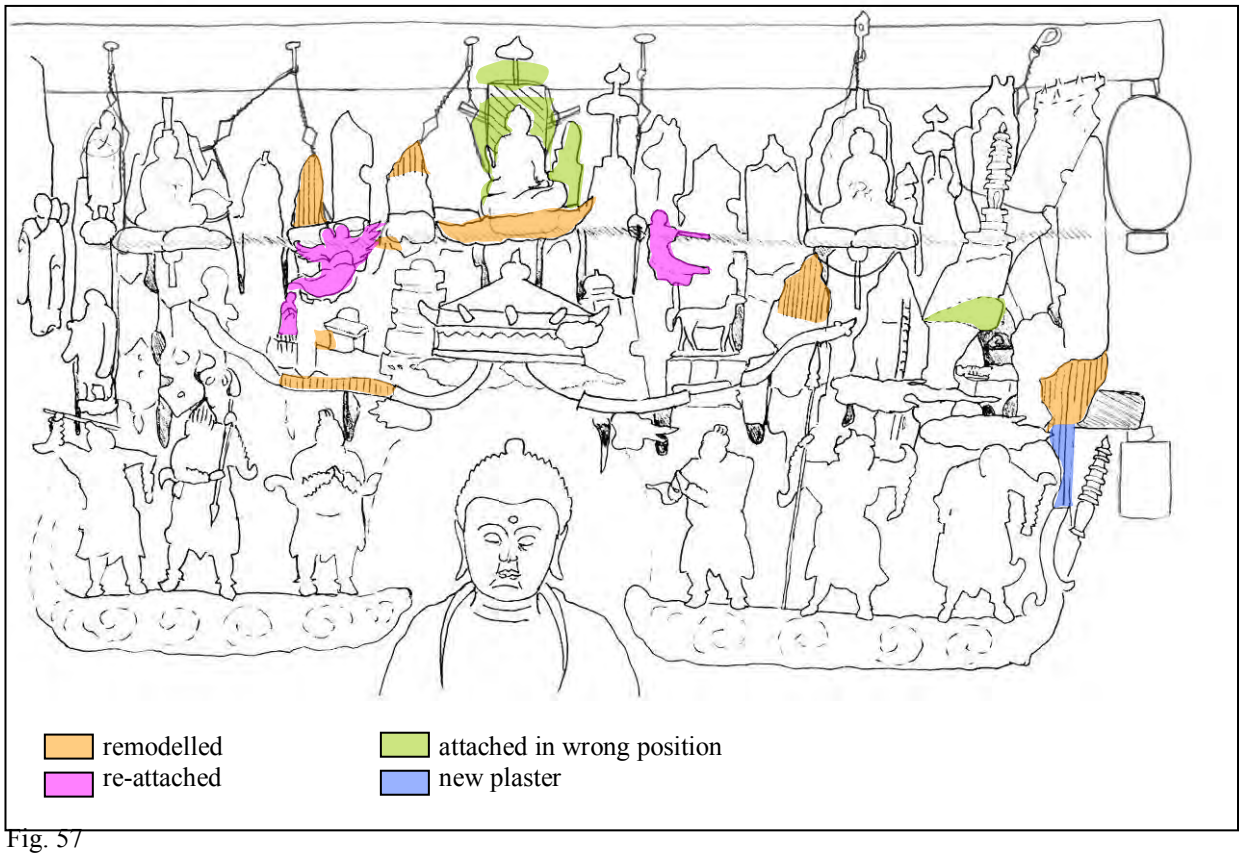


Fig. 57
Overview of measurements during the restoration in 1981-85

Reattachment of loose elements – feitian, shijiamouni, EN 4.8, clouds
Loose parts were re-attached in the upper part (mountain area) only. This was probably done in the restoration from 1981-85.

Feitian *EN 4.5 and 4.6*
The two *feitian* were detached and re-attached. Instead of the original pegs or iron rods, wooden laths were used. They have marks of a saw and are square in cross section (ca. 1.5 cm wide, 2.5 cm high, 30 cm long). For inserting the laths, holes were made into the mountains S 9 and S 18 below the upper pole, with the result that both mountains broke apart. The laths protruded about 13 cm in front of the mountain background, a situation which may correspond to the original distance of the *feitian* to the mountain background. On the backside, the laths ended just below the protruding edge of the tie (15) so that they were prevented from tilting downwards. The *feitian* were attached to the laths by a wire wound around their waist (fig. 58, white arrow). The protruding part of the lath was covered with a clay-straw mixture and roughly shaped like a lost rock element (fig. 58). The rock element S 26, originally positioned behind *feitian* EN 4.5, was detached and re-used behind *shijiamouni* EN 4.3.

Shijiamouni EN 4.3
The original background of *shijiamouni* EN 4.3 may have been lost or severely damaged. Two detached mountain elements, S 25 and S 26, and five cloud parts were used as a more or less "free-style" decoration behind the *shijiamouni*. The elements were pasted together using a clay straw mixture. S 26, originally belonging behind *feitian* EN 4.5, was used upside down. One of the clouds was broken into two halves; one half was used as decoration next to the left hip of the *shijiamouni*, the other one as spacer behind a complete cloud (see figs. 171 and 172). All clouds attached behind the *shijiamouni* originally belonged to other places. Above

Fig. 58
Feitian EN 4.5 before conservation, mounted onto a mountain replacement, coarsely modelled with a straw clay mixture in 1981-85. White arrow: wire fastening the *feitian* to the wooden slat

Fig. 59
Figure of a man EN 4.8, after conservation: too small and roughly modelled completion of severed legs from 1981-85 (clay with hemp fibres)

Fig. 60
Broken cloud Y 7 attached to mountain S 30 in 1981-85 by two nails. Originally there had been a tree: the base of the trunk is preserved, the unpainted area behind the treetop is visible above the cloud.

this decoration another cloud was nailed to the corbel bracket. It originally was positioned behind an element, maybe a figure that concealed its centre which therefore was not painted. Behind this cloud, a fragmented tree was glued with clay straw.
The figure of *shijiamouni* tilts slightly to its right (anticlockwise). This was probably caused by the repairs in 1981-85. Presumably it is the result of the strong tension on the bamboo pole of a lost cloud on its left (= southern) side and of the stabilisation of the background.

Figure of a man EN 4.8
The lower part of the small figure had been broken off (20 cm preserved from head to the knees), the lower shins and the feet were missing. The figure was re-attached to the mountains using a clay-straw mixture; the missing part was remodelled using clay with hemp fibres. The completion is roughly modelled and too short (figure today 23 cm high, fig. 59). Maybe the figure was deliberately shortened, because *feitian* EN 4.5 was mounted too low and otherwise would have hidden the head of the man EN 4.8.

Clouds
Two clouds were re-attached by nailing them to the wall:
- the topmost cloud behind *shijiamouni* EN 4.3 (*see above*).
- cloud EN Y 7 nailed to mountain S 30 below pagoda EN T 1 (fig. 60): Originally there had been no cloud at this place, but a tree of which the stump is preserved. The cloud was affixed by two nails probably because it was already broken into two parts or broke when the first nail was driven in.

Piaodai *of canopy*
The *piaodai* had probably become detached from their pegs and were mounted again.
The left *piaodai* was attached to the pegs, and the fixation area was surrounded with a thick layer of clay with hemp fibres. The part missing between the two pegs was completed rather roughly, omitting the incised groove in the centre, and not painted (fig. 61). Two fragments of the completed part of the *piaodai* were found behind *pusa* EN 4.21 in November 2011 (catalogued as F 61).
On the right side, the *piaodai* was tied to the pegs by hemp fibres, resulting in an instable and fragile mounting (fig. 62). A part of the modelling missing in the centre was either not completed or was not missing yet.

Fig. 61
Left *piaodai* with completion from 1981-85

Fig. 62
Right *piaodai* before treatment: fragile connection to peg (white arrow) by hemp fibres from 1981-85 (yellow arrow)

Completion and remodelling of lost parts

Completions are mainly restricted to the mountain area. Although different materials were used, the completions can be assigned to one period, probably 1981-85. In the area below the mountains, only the fingers of the *baoshen fo* were repaired, but at another time. Table 7 gives an overview of completed and remodelled elements.

1981-85

The peaks and flanks of mountains were roughly remodelled using a coarse clay straw mixture (figs. 57 and 58). The mounting devices of the *feitian* and the right part of the *piaodai* of the canopy were covered with the same mixture.

For completions of finer details and for the reconstructed clouds, a mixture of clay and hemp fibres was used (lost feet of EN 4.8, completed part of left side of *piaodai* of canopy, reconstructed clouds below *shijiamouni* EN 4.3).

Date uncertain

The time at which the following repairs were executed remains uncertain:

- repairs on the hands of the *baoshen fo*: At his right hand, the ring finger and little finger together with part of the hand were remodelled. The remodelling was carried out rather clumsily, and the fingers are too short. The remodelled parts were painted, probably by overpainting both hands.
- repairs on *pusa* EN 4.22: The wrist of his left hand was repaired using clay and paper. The damaged part was painted afterwards. The skin of the figure was completely repainted, maybe in connection with the repair.

Table 7
Synopsis of remodelled and completed element

position	*used material*
1981-85	
Mountain peaks: S 16 (tip), S 11 (top part), S 19 (complete part above pole), S 18 (tip), S 17 (tip)	coarse clay straw mixture
Mountain flank: southern edge next to upper body of *jingang* EN 4.14, lower part of mountain EN S 1 next to EN 4.23 and behind T 2.	clay straw, on top surface plaster with lime and animal hair, now painted white
feet and shins of EN 4.8	clay straw mixture (mountain top and connection) clay with hemp fibres (shins of EN 4.8)
Piaodai, left part, between the two pegs	clay with hemp fibres
reconstructed clouds below *shijiamouni* EN 4.3	clouds: clay with hemp fibres, made in moulds; core behind clouds: clay straw
date uncertain	
remodelling of ring finger and little finger of right hand of *baoshen fo*	?, painted
wrist of *pusa* 4.22 repaired	clay, paper, paint

Completion of lost plaster surfaces (1981-85)

New plaster layers were applied in two areas:

- clay-straw plaster behind *pusa* EN 4.21
- clay-straw plaster and lime-hair plaster at the southern edge of the wall, from the dais to the mountain scenery

Behind *pusa* EN 4.21, a new plaster was applied to the larger part of the wall. On the EN wall, the area between the top surface of the pedestal of the *baoshen fo* and the lower edge of the cloud ledge Y 2 was covered with a clay plaster containing straw. The new plaster continues

on the adjacent GN wall (between edge and *jingang* GN 8.12; fig. 63). It is not clear if remnants of the old plaster are preserved underneath the repair plaster layer. Apparently the plaster next to the pedestal of the *baoshen fo* still is the original one although its surface is rather rough and not painted.
The top of the dais received a new plaster in the repair of 1981-85, but apparently was repaired already before, at least around the pedestal of the *pusa* EN 4.21. The figure broke into the top of the dais and may have been sinking for a longer period, resulting in cracks and damages of the top of the dais. Caved-in parts of the original surface of the top of the pedestal were found under one or two layers of clay plasters which were applied before the renovation of 1981-85.

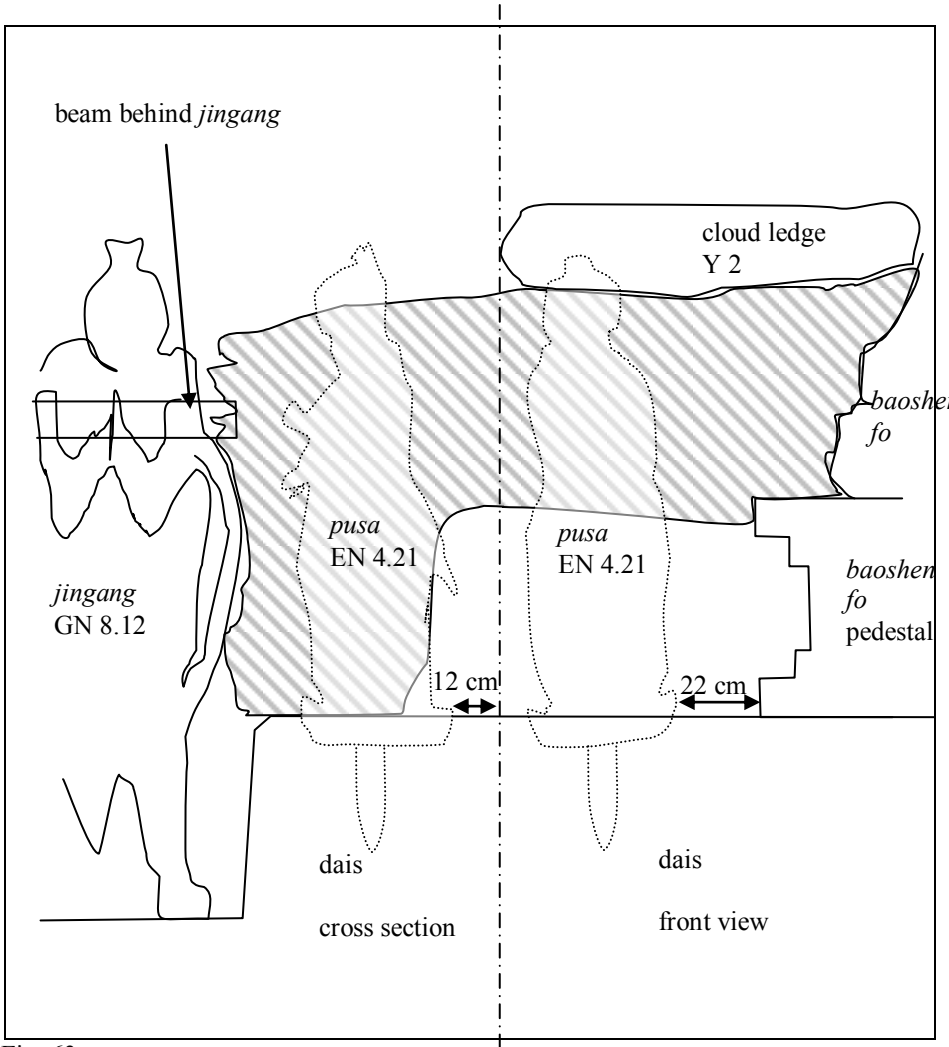


Fig. 63
Area with plaster surface renewed in 1981-85 behind *pusa* EN 4.21, view from south (left part) and from west, i.e. front (right part), situation in 2011

At the southern edge of the wall, a new plaster was applied towards the stone pillar. Originally streams of clouds had been modelled here, which were swinging down to form the cloud ledges. Only small parts of the cloud "stems" are preserved today. The visible surface is a clay plaster with lime and animal hair; the application is about 1 cm thick. The small pagoda T 2 was secured by the same kind of wire as that used in the upper part of the mountains. At the lower end of mountains S 1 and S 32, too, completions with a clay-straw mixture are visible which may have been used to fill larger holes. Clay with lime and animal hair was also used on the top surface of the dais (*see below*). Afterwards a whitewash was applied to the clay-lime plaster, but not to the clay-straw parts.

Fig. 64
Dais seen from above, before conservation treatment in 2011: Lotus pedestal of *pusa* EN 4.21 embedded in later plaster layers. On top of the dais, clay-straw plaster and lime plaster from 1981-85.

Fig. 65
Piece of plaster from 1981-85, removed and turned over: Embedded in the clay plaster, fragments of the modelling of the wall were discovered like this tail of a green cloud.

Revetment of the dais with fired bricks (probably 1960)

The front of the dais is covered with reduction fired grey bricks. This revetment is 77 cm high (measured from the floor). The format of the bricks is 24 x 12 x 5 cm. The same format is to be found at the revetments of the outside of the entrance wall, of the daises of the *jingang* at the gable walls and of the daises of the central wall. According to the former director of the temple, Mr. Fan Weiyue, the brick revetment of the daises dates back to 1960.
The clay plaster behind the brick revetment (fig. 66: 1) which is still visible between *pusa* EN 4.21 and the *jingang* GN 8.12 is the original plaster layer (the joints to *piaodai* of *jingang* 8.12 and to the original plaster of the northern gable wall are preserved). It is not painted.
The top is covered with a clay-straw mixture, on which a lime-containing clay-straw plaster and partly a pure lime plaster were put. At least the lime-containing plasters can be attributed to the renovation of 1981-85. At that time, dust and debris around the *pusa* were not removed, but simply covered with lime-containing clay-straw plaster. The surface of the dais was painted grey, maybe to match the grey bricks. The level of the top surface was raised about 7 cm, now hiding the greater part of the lotus pedestal of *pusa* EN 4.21 (fig. 64). When the plaster layer was taken off in 2011 and 2012, hundreds of smaller and bigger fragments could be retrieved from dust, dirt and sandy material which probably stem from powdered adobe bricks or the filling of the dais. Besides numerous fragments of the reliefs (fig. 65; *also see: List of findings*), remnants of the work in 1981-85 such as gnawed-off corn cobs, shells of sunflower seeds and splinters of wood were found.

Fig. 66
Dais seen from the front, before conservation: Behind the brick revetment from 1960 (2), an original clay plaster (1) is visible. The brick revetment is at least 7 cm higher than the clay dais.

CONDITION BEFORE CONSERVATION

The EN wall shows several types of damage, but the overall condition still is very good. Losses are restricted to smaller parts. Cracks and deformations as well as the tilt of the upper part with the mountain scenery have probably developed over centuries, and no serious deterioration could be detected comparing photographs from 2001 and 2011.
Different types and several causes of damage could be observed.

Causes and types of damage

1. ***The tilt of the upper part of the wall*** is the most serious problem and the main cause of damage to the sculptural decoration in this area. The wall tilted forward for various reasons: the support by the lower pole had got unstable, the support by the upper pole had got lost, and presumably the problem was aggravated by an increased moisture content of the clay modelling (maybe caused by a leaking roof or high humidity over a long period). In consequence, deformations, cracks und breaks happened in the mountains, and the figures became detached from the mountains.

2. ***Deformations caused by the dead load*** of single elements, connected to problems of the fixation system, can be observed at the big figures of the *tianwang* which are tilting forward, at *pusa* EN 4.22 sinking into the broken surface of the dais, and at the somewhat bigger figures and elements in the mountain scenery such as *kongzi* and *laozi* and the two pagodas.

3. ***Mechanical stress:*** All parts are showing damage caused by ***human activity***, probably related to repairs and cleaning of the building resulting in severed (i.e. lost), bent or distorted and kinked parts. This kind of damage affects above all fine elements or elements protruding without support, often modelled over iron wires or thin wooden sticks. Nowadays many of the small decorative parts as *piaodai*, headgear decorations, attributes and trees are missing, their remnants clearly showing that they had been bent or kinked until the substructure broke apart.

4. ***Vibrations*** caused by earthquakes or – on a smaller scale – by airplanes and modern traffic may have increased the damage, but it is difficult to assess the extent of these influences. After the earthquake in May 2008, the figure of *kongzi* EN 4.2 was supported by a wooden prop (see fig. 2). The examination of the situation showed that the figure was less endangered than suspected. A comparison of photographs taken in 2001, 2005 and 2011 did not reveal visible deteriorations of the situation or new damage after the last earthquake.

5. ***Water penetrating*** through the roof or even ***high humidity*** probably increased the deformations and tilts and even stimulated breaks, for the clay has a decreased mechanical stability when it is slightly damp, and there is an increased risk of breaking. With accruing moisture contents the clay becomes malleable, inducing permanent deformations of larger parts under stress of tension or compression.

6. ***Corrosion of iron wires***: While support elements of wood, bamboo and reed mainly are in good condition, parts reinforced by iron wire show serious damage. The most severe problems can be observed at thin wires, especially if they are exposed to the air. Mechanical stress (see 3.) has increased the problems. There still is no concept for the conservation of corroded iron wires, and no treatments to prevent further corrosion were carried out until now.

7. ***Damage caused by previous repairs*** has occurred where the repairs were carried out with unsuited materials or techniques. The repairs executed in 1981- 1985 aimed at safeguarding the wall and can be regarded as adequate in principle, but the materials and the accuracy of the execution are unsatisfactory and visually disturbing, such as the thick wires around the delicate figures of the *feitian* or the clumsily remodelled mountain tips with their rough surfaces. There were wires cutting into the edges of the mountains. The tension of wire fixations was partly misjudged or has changed over time; mostly the tension was too low to provide a support. Clay fillings and remodelled elements show shrinkage cracks (clay + fibre mixture), or the cohesion is too low (clay + mixture), most of the remodelled parts are loose.

8. ***Residues on the surfaces*** result from repairs and the former ritual use of the hall. They comprise: plaster overlapping painted surfaces, marks of fingers soiled with clay suspension, trails of paint dripping down when the rafters were painted, surfaces darkened by soot and oily substances which stem from burning incense sticks.

9. ***Dust and loose materials*** have accumulated on the surfaces since 1985. Behind the mountains and in deeper recessions there also were materials from the work in 1981-85 and even dirt from before 1981. The accumulations comprise: fine dust (up to 2 cm high on vertical surfaces), often embedding detached fragments of the modelling; plaster from the wall and the roof, lumps of clay from remodelling, splinters of wood, pieces of roofing cardboard, corn cobs (eaten by workers); bamboo slips used for prayers; shards of broken tiles; bones of small rodents and animal excrements, dead insects, airborne plant parts.
   Additionally, like on other walls, bills and coins of low value were found everywhere. As the habit of throwing money on the sculptures is still prevailing, newly ‘donated’ money was collected from parts of the wall, the dais and even the scaffold during the work period in 2011.

10. ***Damage to the surfaces***: Especially the leaf gilded parts of robes and weapons show problems caused by the detachment of the polychromy. Partly the paint layer is weakly bond and chalky. In some areas, the very sensitive green is lost, and the grey underpainting is exposed. A thorough cleaning is necessary to remove traces of fine dust. There are dark stains, appearing oily, especially in the faces. The cause is not clear so far: they may stem from burning incense, but partly they seem to be connected to trails of brownish materials running down over the surfaces, which may be related to the painting of the rafters. Fine-cleaning of the surfaces and consolidation of the paint layers were not included in the treatments scheduled for 2011, and thus were not started.

The positions of cracks, broken or detached parts, losses and wire fixations in the mountain scenery are recorded in a mapping (see p. 137-144). The recording of the present condition of the single sculptures and the state of damage was done by the Xi'an Shaanxi Institute for Conservation.

Considerations on the deformation of the upper part of the wall

The most serious problem of the EN wall is that it has got tilted and distorted. The upper part of the relief with the mountain scenery is bent and hanging forward. The curving starts at the bottom line of the mountains. From the technical point of view, this is the level where the solid clay wall ends to be replaced by reed bundles as support of the modelling.

A similar construction with mountain sceneries can be found above the heads of five other large Buddha and bodhisattva sculptures in the hall (above the *baoshen fo*, *yingshen fo*, *yaowang pusa*, partly preserved or mainly lost above the *dizang pusa* and *kongqueling wang*). All of them are curved, with slightly overhanging mountain areas. The mandorlas of the Buddha statues in front the middle wall (*yaoshi fo*, *shijiamouni* and *amitou fo*) are curved, too. The curving is a deliberate construction: The curved mandorla seems to enclose the Buddha figure. The overhanging figures embedded into the mandorlas seem to look down at the visitor who can look into their eyes. For the same reason the figures in the tiers are modelled "top-heavy", inclining slightly forward. In view of this conceptual design it can be assumed that the mountain sceneries, too, were modelled slightly curved and overhanging.

In spite of this consideration, the current situation of the EN wall is not the original one, but the result of slowly progressing damage: horizontal cracks with misaligned fracture edges indicate a distortion caused by tilting. The tilt of the mountain area of the EN wall is more distinct than that on the ES wall which does not show any horizontal cracks below or in the mountain part.

A mountain hidden behind mountain S 22 (left to *kongzi* EN 4.2), at the northern end of the wall, reveals a gap of 7 cm width between the reed bundle and the modelled clay shell, indicating a tilt of the mountains that separated the modelling from the reed core (fig. 68). Level with mountain S 22, there is, at the southern part of the wall, the peg connecting mountain S 11 to S 7: Its tip, which had been bent when it had struck the wooden construction behind, still touches the wood (fig. 69). This indicates that the lower part of the mountains was curved forward from the beginning. At the northern end of the wall, the mountains of the EN wall completely conceal two monks, GN 7.19a and GN 7.19b, standing on the northern gable (GN) wall, and hide parts of the relief decoration of the GN wall (fig. 70 and 71). As these parts, with parapets and mountains, and the two figures are elaborately painted, they must originally have been visible. The damage to mountains S 23 and S 29 proves that the lower pole has moved forward at the southern end, deforming the two mountains until the clay modelling broke over the bulge of the reed bundle.

The upper part of the wall decoration tilted forward, but also sagged. This happened because the upper pole is unsupported. The effect was probably increased by another factor: the clay modelling absorbed water during seasons of high humidity or even in consequence of a leaky roof, and thus became heavier, mechanically weaker, maybe even malleable. This increased the bulge emerging at mountain S 23. Monk EN 4.1 attached to it was pressed downwards, so he is about 3 cm lower today than originally.

These observations allow the conclusion that a slight overhanging of the mountains was intended, but less than in the current situation. The extent of distortion could not be measured because the exact original shape could not be ascertained. The investigation showed that the lower pole had slid forward, pushing the mountains forward, and that this displacement is more distinct at the northern end than at the southern. On the other hand, cracks caused by tilt appear at the southern part of the wall, not at the northern. The upper part around the unsupported upper pole tilted forward and was distorted under its dead load, with the result that the mountains bent and the fracture edges became misaligned.

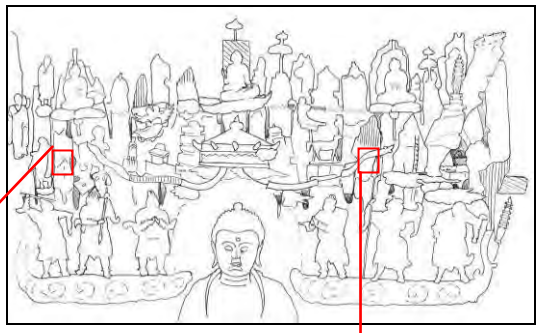


Fig. 67
Position of the views behind the mountains presented in figs. 64 (northern end) and 65 (southern part of the EN wall), at the level of beam (3) of the wooden construction

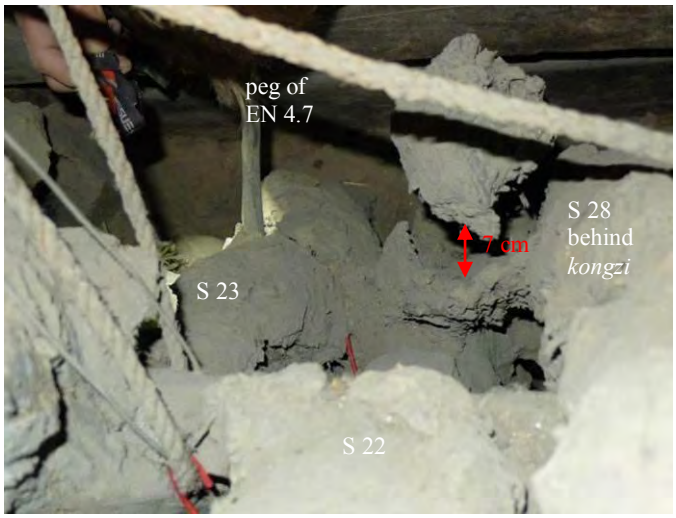


Fig. 68
Gap of 7 cm between reed bundle and clay modelling of mountain

Fig. 69
Wooden peg connecting S 11 to S 7 with bent tip in front of wooden element (3)

Fig. 70
North-East corner: Monks GN 7.19a and GN7.19b hidden behind the tilted mountains of the EN wall (red arrows)

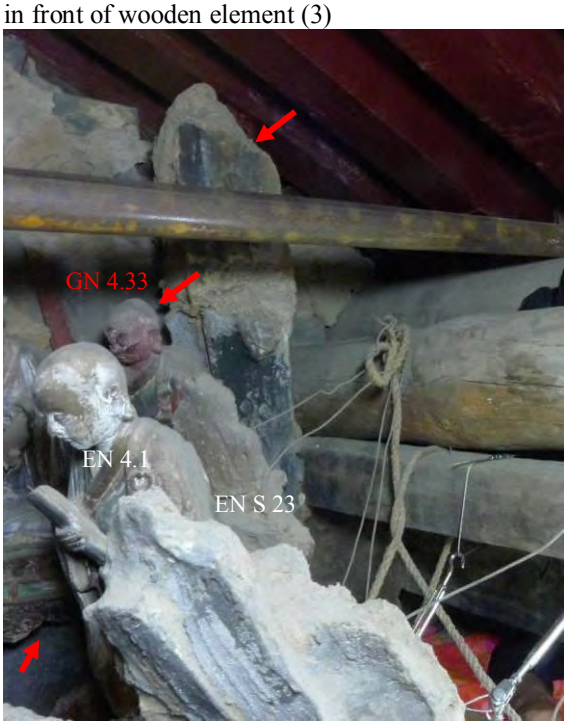


Fig. 71
North-East corner: Mountains of the EN wall concealing figures, parapet and mountains of the GN wall (red arrows)

The tilt of the mountains led to the following cases of damage:
- system of horizontal cracks through the wall behind the *tianwang* EN 4.12 to EN 4.14
- system of horizontal cracks extending through the mountains from S 11 up to around EN 4.23 and below it
- fracture edges out of alignment
- bulging of mountain S 23 caused by dislocation of the lower pole and sag of the upper pole, resulting in: breaks of the clay modelling; detachment of parts of the modelling including monks EN 4.1 and EN 4.7; sag of monk EN 4.7
- deformation and breaking of the mountain below the feet of GN 7.19b caused by dislocation of the lower pole; in consequence detachment of GN 7.19b from the peg. GN 7.19b cannot be put back to the original position because the mountain is compressed and broken and the space has become too small to insert a figure
- behind *kongzi* EN 4.2: gap between the layers of mountains in front of and behind the upper pole (4 cm wide at the top of the mountains, 1 cm wide at the upper pole)
- behind *laozi* EN 4.4: crack between the layers of mountains in front of and behind the upper pole

The tilt may also have caused the following cases of damage:
- breaks and losses in the background of *shijiamouni* EN 4.3: the original modelling may have been connected with the iron pins inside the corbel bracket, and the connection may have broken apart when the mountains tilted forward. Traces of clay on the sides of the corbel bracket indicate that the mountains have tilted forward about 4 cm. The gap between the corbel bracket and the mountains on the right side measures 2 cm: this could indicate that the mountains shifted laterally away from the wooden construction.
- detachment of *feitian* EN 4.5 and EN 4.6 caused by loosening of the pegs
- increase of the tilt of *tianwang* EN 4.13 and EN 4.14 in the upper tier, right side, including the cloud ledge Y 3 below their feet, resulting in damage to the lower tier of the right side (breaking of the *piaodai* around the heads of EN 4.19 and EN 4.20 which are positioned below EN 4.13 and EN 4.14)

In the North-East corner (i.e. between EN wall and GN wall), there is a wide-open vertical crack extending from the level of the *tianwang* to the top of the wall. For technical reasons, it was not possible to check the situation thoroughly nor to investigate whether the crack continues downwards (*see below, Summary of the work carried out in 2011 and still to be done*). The crack indicates that the two walls, or one of them, have moved, but contrary to assumptions expressed by experts from the Shaanxi Institute for Conservation, no evidence for a sag or deformation of the complete EN wall was found. A comparison of the fracture edges showed the following results: Next to *tianwang* EN 4.9, i.e. directly below the mountain scenery, the gap is about 1 cm wide. Here as well as at all other levels, the fracture edges correspond exactly with each other in vertical direction. This proves that there was no sinking of the EN wall. But the fracture edges are not aligned with each other horizontally – they are protruding resp. receding with relation to each other. The fact that the replacement plaster from 1981-85 behind *pusa* EN 4.21 has cracked along the corner may indicate that movements between the two walls continue, but for an assessment of the situation further examinations are necessary.

Occurrences of damage in detail

The most important cases of damage and their characteristics, and figures or areas with special kinds of damage are described in the following. In tables 9 and 10, the occurrences of damage are listed according to the single figures or parts of the wall. Tables 11 and 12 list the losses in the same way.

Cracks in the wall surface and the mountain area

Cracks in the modelling of the wall and the mountain area are mainly restricted to the southern half of the wall. There are two main cracks in the upper part of the wall (fig. 72):

- Lower crack: There is a long crack running from the mountain next to *tianwang* EN 4.11, behind the head of the *baoshen fo*, continuing behind *tianwang* EN 4.12 and EN 4.13, and ending behind *tianwang* EN 4.14. The end of the crack is connected to the crack system around EN 4.23.
- Upper crack: A shorter crack system stretches over the mountains from S 11 through S 33, S 5 and S 30, and ends next to the corpse EN 4.23.

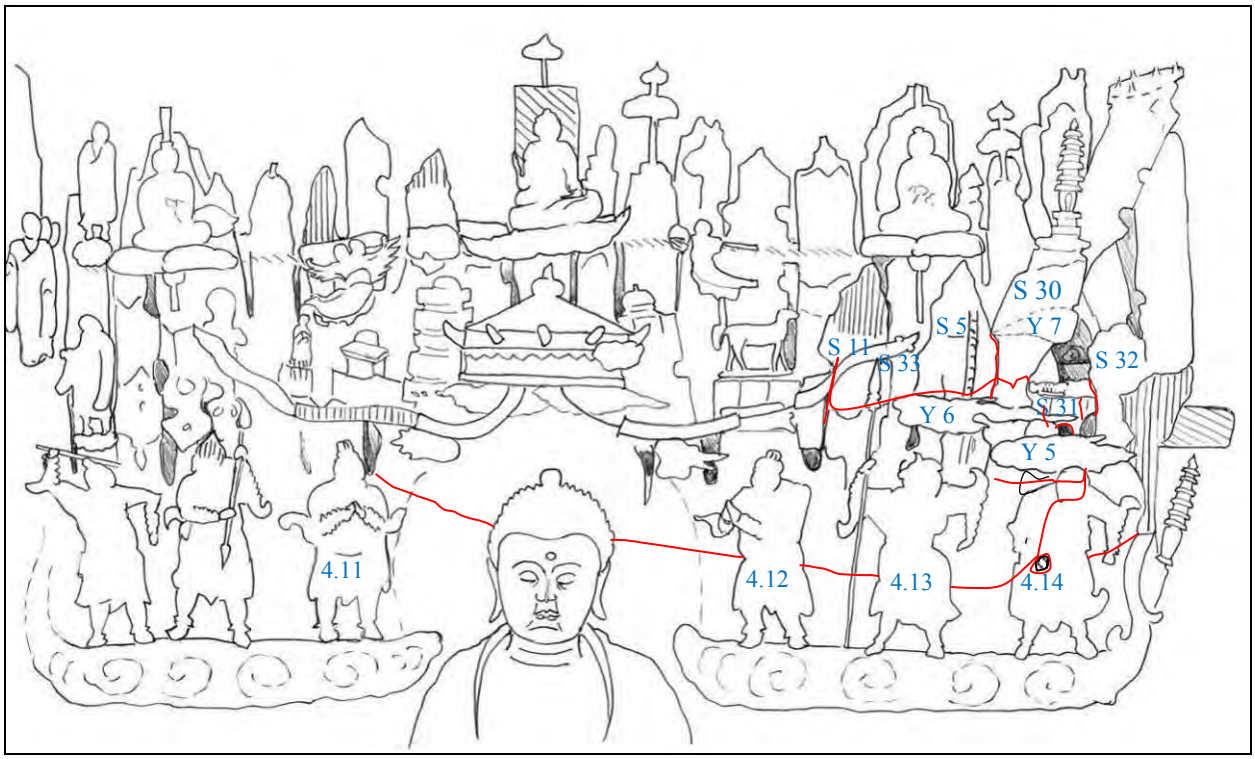


Fig. 72
Schematic overview of the position of cracks in the wall and the mountain area

The lower crack is not visible behind the head of the *baoshen fo* and the bodies of EN 4.12 and EN 4.13, but is obviously continuing there. Although the crack is positioned in front of the solid part of the clay wall, it is caused by the tilt and deformation of the mountains above. It probably runs next to the pegs of EN 4.12 and EN 4.13. *Tianwang* EN 4.14 has tilted forward and seems to be in an advanced process of detachment from the wall. The crack runs around the peg (fig. 73), and continues upwards to an opening in the mountains behind the head of EN 4.14 (below cloud Y 5). The fracture edges are out of alignment, the upper part protruding over the lower one. Behind EN 4.14, the situation changes: At the peg, the left side (formerly upper part) of the wall recedes behind the right side; behind the head of EN 4.14, where the crack is running vertically, the upper (left) part recedes 7.5 cm behind the lower (right) part of the wall (fig. 74). The cause of this dramatic shift is not clear. Nowadays the

wall parts are locked fast in this shifted position and cannot be pushed back in order to close the gap. A shorter crack visible behind the left arm of EN 4.14 is probably connected with the long crack, but the connection is not visible.
The upper crack shows the same change of protruding edges: While at the mountains S 11, S 33 and S 5 the upper part protrudes several millimetres over the lower one, the situation changes where the crack continues in mountain S 30 next to the corpse EN 4.23: Here the lower part of the mountain protrudes about 2 mm at the fracture edge. The maximum width of a crack is 5 to 10 mm. The top part of mountain S 11 and the lower part of mountain S 5 were loose.

Fig. 73
Crack around peg of EN 4.14

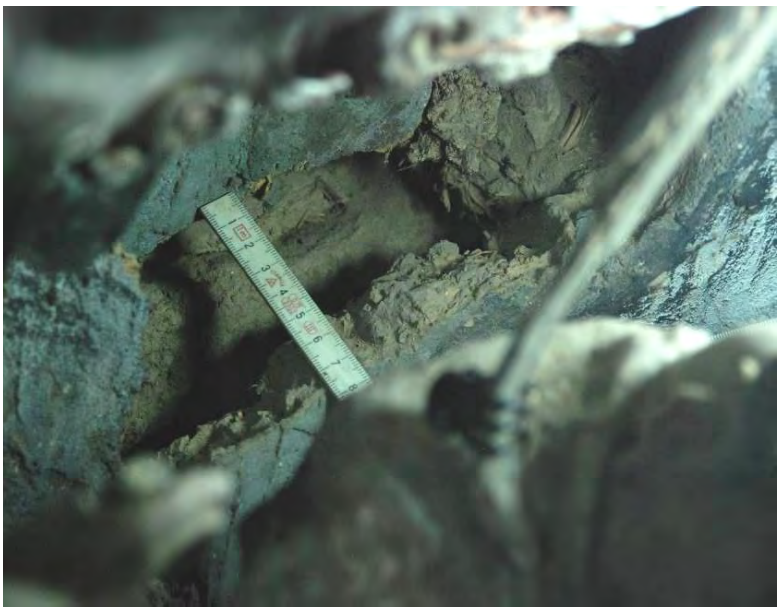


Fig. 74
Biggest misalignment of a crack (7.5 cm) behind the shoulders of EN 4.14 (below cloud Y 5)

Fig. 75
Upper crack, right part through mountains S 5 and S 30 (above cloud Y 6)

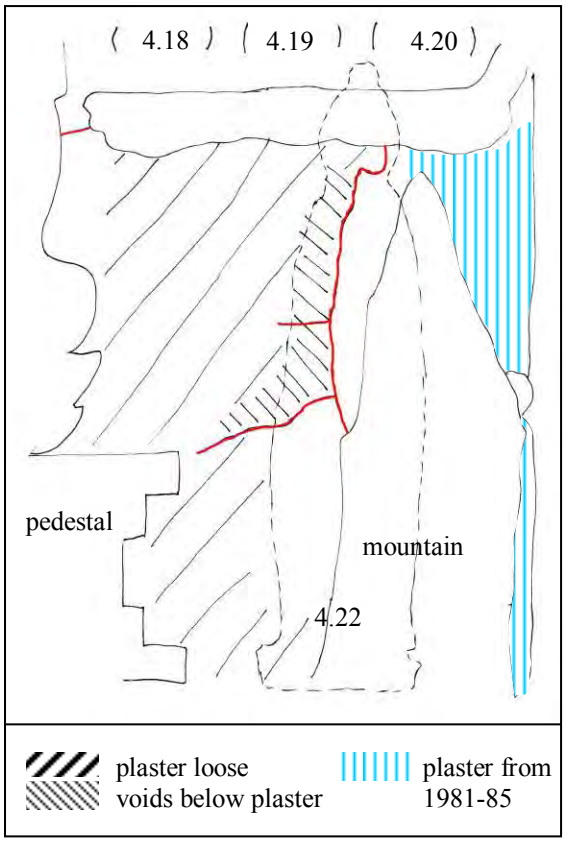


Fig. 76
Schematic view of wall behind pusa EN 4.22 with cracks, loose plaster and voids

Another crack system is visible in the lower part of the wall behind *pusa* 4.22. The cracks extend behind the figure next to the mountain hiding the peg between figure and wall.
A vertical crack runs downwards from the cloud ledge Y 1 on the left side of the mountain behind EN 4.21. Just above the mountain, it meets a second crack which is running at the left and slightly downwards to the upper edge of the pedestal. Between the crack and the *baoshen fo* or his pedestal the plaster has got detached from the wall. Next to the crack the voids are deeper.
The cracks may have developed because the figure of the *pusa* tilted or sank into the dais, resulting in tensions between peg and wall. They may also have been caused by problems within the clay wall. The detachment of the plaster from the wall may have been the reason why the plaster next to the edge and behind the other *pusa*, EN 4.22, had been renewed in 1981-85. It is not clear if remnants of the original plaster are preserved underneath the repair plaster.
Between the left foot and the hanging tip of the tunic of *tianwang* EN 4.20, there is a larger void inside the wall, which is accessible through a hole left behind by a lost *piaodai*. Inside the hole there is a lot of powdered clay substance. Here, the wall seems to be seriously damaged behind the surface.

Loose parts

Most parts and figures of the wall are stable, even those which have tilted or are distorted. The figures of the religious teachers EN 4.2 (*kongzi*), 4.3 (*shijiamouni*), EN 4.4 (*laozi*), and *tianwang* EN 4.13 and EN 4.14 are stable even though there are cracks behind their backs or around their bases. The peg of *tianwang* EN 4.10 is slightly loose. The figures EN 4.7 and GN 7.19 b had got detached from the wall and were held in place only because they had been wedged into tight corners where they could not come down. The mounting of the *feitian*, already replaced during the renovation in 1981-85, was not stable (*see below: feitian*). Parts of the clay modelling of the mountains broke when the reed bundles were bent under stress. The clay 'shell' got detached from the reed core, partly only becoming loose, partly also falling off or sliding down (*see below: mountain S 23*). The upper part of the rather short mountain columns S 11, S 5 and S 19 became loose when the horizontal crack developed across the centre of the mountain scenery.
The *piaodai* of the canopy became loose because the hemp string which had been wound around the peg during the manufacturing, slid from the tip of the peg. This happened already before 1981, as the repairs executed in 1981-85 prove.
Small elements, above all the *piaodai* of figures and decorations on headgears, got loose because of insufficient adhesion to the main part (clay to clay) or broken wire connections (corroded hooks and loops).

Broken parts

Parts broken into pieces are restricted to small elements. Fractures occur on thin, elongated and unsupported parts as *piaodai*, arms, fingers, strands of hair, sleeve tips. The broken parts are generally modelled over wire (*see below*: *corrosion of original wires*). Most of the *piaodai* are broken. Five fingers of the *baoshen fo* were fractured. The ring finger and the little finger of the right hand had already got lost some time ago; the extant fingers are reconstructions. Many tails of clouds are broken. When clouds had been reinforced by a bamboo stick, the tails mostly have breaks, but are preserved; when clouds had been made with wire reinforcement or without any inner reinforcement, the tails or parts of it are broken off today.
A typical position of cracks is the necks of figures: At EN 4.5, 4.6, 4.23, 4.21, 4.23 cracks have formed at the transition from the neck to the shoulders. EN 4.5, 4.6 and 4.23 had loose heads. The pagoda T 1 is broken at the base and slightly unstable.

Corrosion of original wires

The corrosion of the iron wires used as substructure of thin, elongated parts is a serious problem and affects the fine decorations. The wires used at the EN wall have different diameters, from about 0.3 mm to 2 mm. Thick wires, like inside the arms and the *piaodai* of the canopy or the fingers of the *baoshen fo*, are still in good condition: They still are flexible and not corroded. Most of the *piaodai* of the figures, the bead chain pendants and the decorations of the crown of the *pusa* had been reinforced by wires of about 1 mm thickness. For very fine elements even thinner wires were used.
The damage to elements with wire reinforcement is caused by the unfavourable combination of two factors: mechanical stress and corrosion. Elements with a wire inside can be bent slightly, but tend to break when more force is applied. Breaks occur across the element and along the wire. Exposed wires corrode faster than the ones still embedded in the clay modelling.
The corrosion increases the volume of the wire. By that, the clay modelling is torn from the wire, and more of the wire becomes exposed. Most of the *piaodai* show cracks along the wire, splitting the modelling in two parts; almost all of the clay beads are broken, often into two halves, sometimes also in three parts (fig. 77).
Cracked parts are more sensitive to mechanical stress. The cracked clay modelling breaks into fragments and comes down until only the wire remains. This can be seen at many *piaodai* or decorations on headgears. Heavily corroded wires break when they are bent or just touched, or do so under the weight of the remaining clay modelling. This can be observed on the bead chain pendants. Their fragments are so fragile that they are breaking as soon as they are touched or laid down: The fractures show that the wires are corroded up to the core.
All *piaodai* and decorations of caps, all the elements fixed by means of wire loops, such as weapons (the weapons themselves are made of bamboo at this wall), strands of hair and especially the fragments of beaded chain pendants, are extremely in danger of breaking apart and getting lost. From twigs with leaves and fruits, probably an attribute of *pusa* EN 4.21, nothing but fragments is left over: The *pusa* is holding an unrecognisable stick-like object in one hand, while the other has lost its fingers.

Fig. 77
F 12 (found next to *pusa* EN 4.22): beads and rosette cracked because bending and corrosion of the wire core, Nov. 2011

Damage caused by previous repairs

The damage related to the materials and techniques used in previous repairs is rather small. The wires used for the fixation of the mountains in 1981-85 have cut into the clay modelling at the mountains of *kongzi* and *laozi* and at the mountains S 2 and S 3. It is not clear if this happened already when the wires had been installed or later.

Fig. 78
Overview of losses
(very small elements are not included. For a complete list of losses see tables 10 and 11)

Some of the remodelled parts – the upper parts of S 11 and S 19 and behind the *feitian* – were loose, probably because of the shrinkage of the clay during drying. Other elements are stable, for instance the 'feet' of EN 4.8 or the remodelled part of the left *piaodai* of the canopy.
The tension on the wires was too low to hold the supported parts in place, but probably prevented them from falling down. The inclination of *shijiamouni* EN 4.3 may be caused by an irregular tension on the wires, but it can also be the result of an ill-fitting mounting of the figure in 1981-85.
Another aspect is that the appearance of the fixations and completions made in 1981-85 is aesthetically unsatisfactory or even disturbing: The wires around the waists of the *feitian* were too unsubtle. Remodelled parts appear shapeless, and they overlap the original modelling (from S 11 overlapping S 6; S 19, S 17, S 16, *piaodai* of canopy, EN 4.8, stem of Y 3). The mountains (S 11, S 16, S 17 and S 19) remodelled with straw containing clay, have a coarse and 'hairy'-looking surface. Numerous marks of fingers soiled with clay suspension can be found on the original polychromy.
The remodelling of the lost ring finger and little finger of the right hand of the *baoshen fo* is plump, and the fingers are much too short. The remodelling is painted: This presumably indicates that the repair was not executed in 1981-85. It may have been done at the same time as the repair of the wrist of *pusa* EN 4.22 with paper, as the wrist was also repainted (and his skin as well).

Lost parts
Although the EN wall appears to be nearly undamaged and complete, a closer look reveals numerous missing parts. Many small parts, mostly the ones with a wire core, are lost, reducing the decorations and details of figures and reliefs. Fracture edges and detached fragments, mainly found around *pusa* EN 4.21, reveal that the original design was by far richer than it is today. Fig. 78 shows an overview of the lost parts.

The following aspects are important for the visual impression as well as for the iconography:
- There had been more trees in the mountains: Today only two trees are preserved (one on S 10, the second broken off from S 4), but originally there were at least six, maybe even nine more. Eight other elements are missing in the mountains, maybe clouds or other, more rounded parts. On top of S 2 probably a bigger animal with four legs and maybe paws is missing. This means that the mountains were much more 'populated' with elements.
- An object, now lost, was positioned on the table next to EN 4.8.
- Both *feitian* had had two heads.
- The legs of the corpse EN 4.23 are missing as well as something at his feet which may have explained why a corpse is lying in the mountain cave.
- There had been more attributes in the hands of the *tianwang*: A spherical object is missing in the left hand of EN 4.19. The missing right hands of EN 4.9, 4.14 and 4.20 may have held weapons.
- The position of the hands of the *pusa* shows that they were designed mirror-inverted. The lost attribute may have been a twig with fruits or blossoms and leaves.
- Originally the canopy of the *baoshen fo* had had a delicate 'curtain' over his head, consisting of a complicated arrangement of beaded chain pendants attached to an arm of the canopy.
- The pedestal of the *baoshen fo* had been covered with decorative open-work elements and had had two feet. Together with the beaded chain pendants of the canopy, it gave the impression of splendour, playfulness and delicacy, though probably its decoration was not as rich as that of the pedestal of the *yingshen fo* on the ES wall (fig. 79). The decorative elements are lost except for a one part on the right side of the topmost step next to the wall, showing a gilded ornament of a coiling dragon (fig. 82). Fragments from the left side were found in the debris around *pusa* EN 4.22 during the work stay of 2011.

Fig. 79
Pedestal of *ying-shen fo* on ES wall
[original photographs: Shaanxi Institute for Conservation, mounted from two photographs]

Fig. 80
Pedestal of *baoshen fo* on EN wall
[mounted from two photographs and virtually retouched; original photo-graphs: Shaanxi Institute for Conservation]

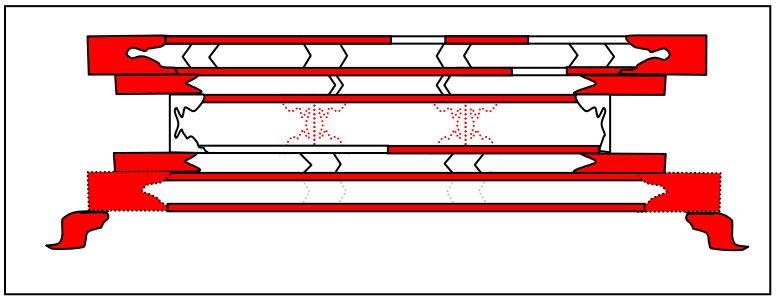


Fig. 81
Pedestal of *baoshen fo*, schematic view:
Lost parts are marked in red.
Dotted lines indicate hypothetical reconstructions.

Fig. 82
The only preserved part of the open-work decoration of the pedestal of the *baoshen fo*, showing a gilded ornament of a coiling dragon.
It is positioned on the right side of the topmost step, next to the wall.

Figures and parts with special situation of damage

Mountain S 23 with monks EN 4.7 and EN 4.1

S 23 is the last high mountain of the EN wall towards the North-East corner. Its base is at the top of the clay wall, and it reaches up to the level of the purlin. For making the reed core, one reed bundle was set on top of the clay wall and positioned behind the lower pole. A second reed bundle starts on top of the lower pole (fig. 85: x). The two reed bundles were placed around the northern end of the upper pole, so its tip is concealed inside the mountain S 23.

There are two monks attached to the mountain, one above the other. The feet of the lower one, EN 4.7, are positioned in front of the lower pole, the feet of the upper one, EN 4.1, just above the upper pole. The mountain peak is concealed behind the back of EN 4.1.

The mountain is broken into three parts: The lowest one (fig. 83: 1) with monk EN 4.7, the middle one (fig. 83: 2) behind the upper part of the body of EN 4.7, and the upper one with monk EN 4.1. The upper part is broken into two parts (fig. 83: 3a and 3b) still adhering to each other. The three parts had got detached from the clay core and were loose. The damage resulted from the distortion and shifting of the two poles: Because the lower pole was pressed forward, it forced the reed core to bulge. By sagging down the upper pole diminished the distance between the two poles and through this increased the bulge by compression.

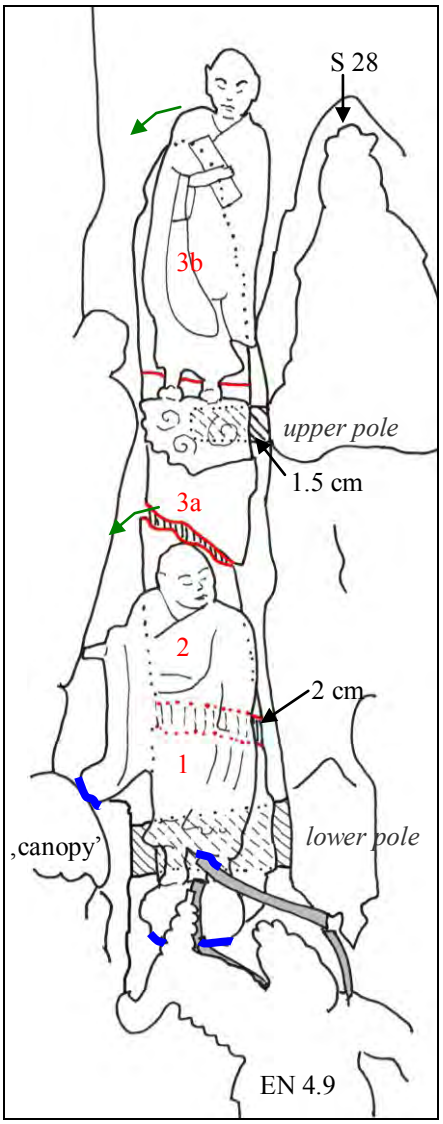


Fig. 83
Sketch of S 23 before treatment: mountain broken into three parts

The lowest part of the mountain (1) had sagged. Monk EN 4.7 had tilted forward until he slipped from the peg and slid down. He had got detached from the wall and was only held in place because the cloud on which he was standing rested on the back of *tianwang* EN 4.9, and the tip of his right sleeve leant on a small canopy of the GN wall (fig. 83: blue lines). The *piaodai* around the head of *tianwang* EN 4.9, originally attached at the centre of the cloud below the feet of EN 4.7, was crushed by the weight of EN 4.7. The tip of his right sleeve was bent and broke; the surface was abraded.

The middle part of the mountain (2) slid down about 1 cm and tilted to the left (fig. 83: green arrow), the lower edge turned to the right. The modelling of the backside of the middle part was missing. The gap between the lower and middle part measures 2 cm. Because of the tilted situation, the gaps between the two parts could not be closed anymore.

The upper part of the mountain (3a/b) tilted to the left and to the back. According to the imprints from the upper pole inside the mountain it was leaning backwards about 2 cm. Because the right sleeve of monk EN 4.1 touched the mountain S 28 in this position, the mountain was pressed to the left, so that a gap of 1.5 cm width opened between S 23 and S 28 (behind *kongzi*) at the upper pole. This deformation may have been caused or increased by the wire put around the mountain peakin the 1981-85 renovation. Without this wire, the top part of the mountain with EN 4.1 would have been completely loose.

Fig. 84
Lower part of mountain S 23 with monk EN 4.7 before treatment.

Fig. 85
S 23 after detachment of monks EN 4.7 and GN 7.19b. The distortion of the mountain becomes visible; x = reed bundle starting on top of lower pole.

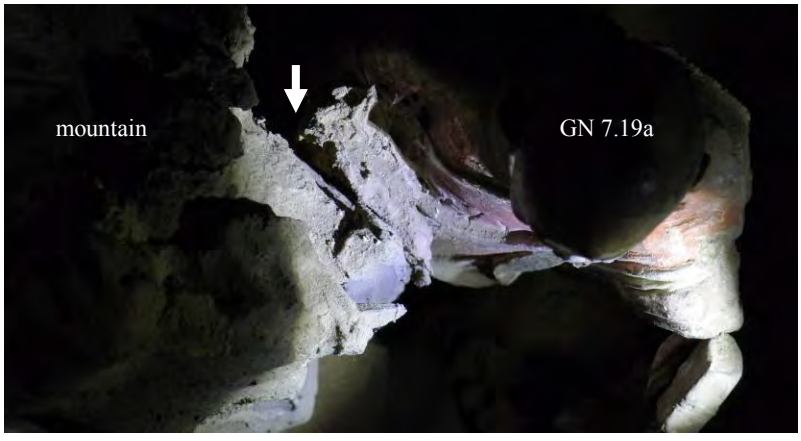


Fig. 86
View at GN 7.19a from above. The monk got detached from the mountain at his right side and tilted sideward and to the front. The edges of the fracture between monk and mountain are misaligned (arrow).

Monks GN 7.19a and GN 7.19b with mountain S 29

The short mountain S 29, the last mountain of the EN wall and already in the corner to the GN wall, was deformed in the same way by the lower pole being pressed forward. The modelling of the mountain was severely damaged (fig. 85 and 87).

Monk GN 7.19b is standing next to mountain S 29. His left sleeve tip and his left foot were attached to the mountain and partly hidden by it. When the mountain had been pushed forward, the monk became detached from the wall and slipped from his peg. In 2011, he was leaning loosely against the shoulder of GN 7.19a, but he was not in his original position (fig. 88). The rock ledge below his feet has caved in and is partly instable.

Monk GN 7.19a was still attached to the rock ledge, probably by the vertical bamboo pole which protrudes below his feet. His right shoulder had been attached to the mountain next to him, but the connection was broken. Smaller parts of the clay used for connecting mountain and figure had fallen into the gap pressing the monk away from the mountain, and through this he had tilted to his left side and forward (fig. 86). By his tilting towards the east wall and by the shifting of mountain S 29 which had been pushed forward towards west, the space had become too small to insert GN 7.19b in a suitable situation and upright.

Between GN 7.19b and S 23 an element is missing. It had been attached to the mountain in the corner covering the left side of monk GN 7.19b and the top of mountain S 29. The missing element cannot be reconstructed. It may have been a landscape element of a somewhat more elaborate lay-out (not an upright mountain).

Because mountain S 23 tilted, the two monks are almost completely hidden and difficult to reach. The figures 89 and 90 show a schematic view of the corner situation with the two monks.

Fig. 87
Detail of S 29 pushed forward by the lower pole (GN 7.19b removed)

Fig. 88
Mountain, GN 7.19a and GN 7.19b before treatment

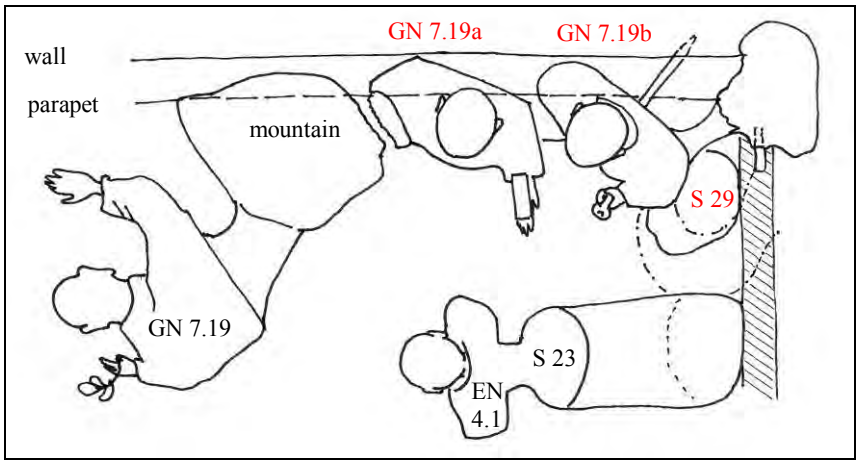


Fig. 89
Schematic view of the corner situation with GN 7.19a and GN 7.19b seen from above
(not in scale)

dashed line: outline of lost element

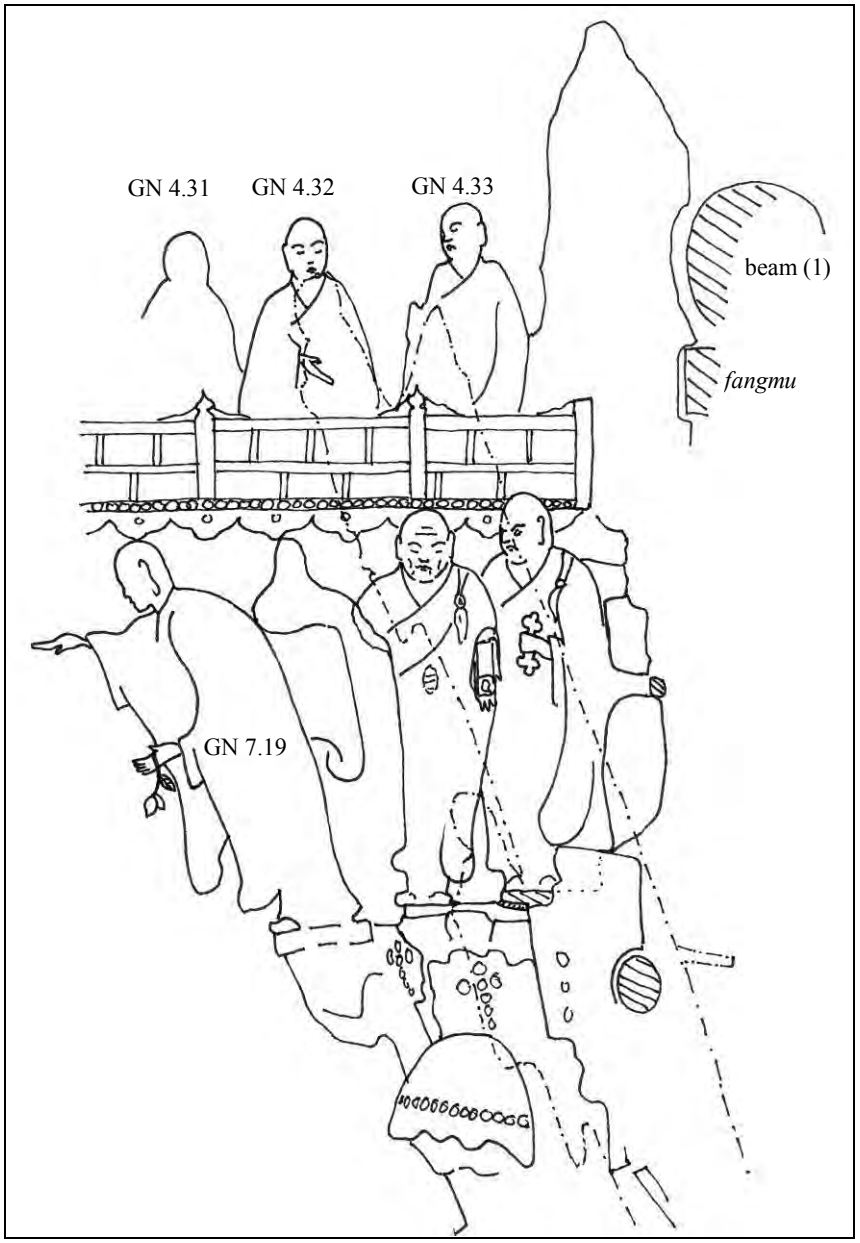


Fig. 90
Schematic view of the corner situation, view on the GN wall
(not in scale)

dashed line: outline of mountain S 23 with EN 4.1 and EN 4.7

Shijiamouni EN 4.3

Shijiamouni EN 4.3 is the central figure in the mountain scenery and an important figure. The background and surroundings of the figure had probably been designed similar to those of *kongzi* and *laozi* with mountains and clouds, but must have been badly damaged before 1981. Below its right knee, the original connection to the mountains is preserved, proving that the figure itself is still in the correct position.

Fig. 91
Shijiamouni EN 4.3 before treatment in October 2011. The background was reshaped with fragments of clouds and mountains in 1981-85.

Its slight, but irritating tilt to the left side can be seen as the result of an ill-fitting repair in 1981-85: the figure tilted either because it was reattached in this position or because the tension on a bamboo pole next to its left knee was too high. The connection to the wall is stable. The original background is missing today. Fragments of two trees, four clouds (one of them broken into two parts) and a tree were used in 1981-85 to shape a new background and hide the corbel bracket behind the figure (fig. 91). The original background was probably connected to the corbel bracket; it broke and got lost when the mountains started to tilt and break off from the corbel bracket. The background "created" in 1981-85 gave the impression of mountains and clouds, but it consisted of parts missing elsewhere, and it was arranged rather crudely: The unfitting compilation of preserved parts is shown by the fragmented tree topping the uppermost cloud nailed to the corbel bracket. The original position of the re-used fragments is not known except for the mountain part S 26 which belongs behind *feitian* EN 4.5.

Feitian EN 4.5 and 4.6

The two *feitian* are the most severely damaged figures of the EN wall. The reasons for this are not completely clear. The protruding feathers, thin *piaodai* and thin arms were fragile parts which could be broken easily, but this would have required some mechanical force. Both *feitian* lost the fixation device by which they were mounted to the wall. Probably the iron pins slipped out of the wall when the wall tilted. Maybe the *feitian* even fell down. This could explain the losses of the major parts of the wings, as well as the lost arm and head of the more severely damaged *feitian* EN 4.6. A complete detachment from the wall and may be the loss of the iron pins also may have been the reason for a new mounting. The wires of the *piaodai* between waist and hip (the modelling is completely lost) are kinked in a way that can be related to a firm grip around the waist and may have happened when the detached *feitian* were picked up. The possible fall of *feitian* EN 4.5 could have been the reason why the man EN 4.8 standing below the *feitian* (see fig. 92) broke off at his legs.

The new mounting in 1981-85 did not show much sensibility: mountains S 9 and S 18 were split when the wooden lath which served as peg was forced through their substructure. The position at least of *feitian* EN 4.5 was too low. The clay-straw lumps hiding the laths and replacing the lost mountain elements were roughly modelled and not firmly attached to the wall or the *feitian*. The wires around the waists of the *feitian* were too thick for the small figures and not tightly enough connected to the laths. The laths themselves were loose. As a result, both *feitian* were loose and at risk of falling down.

Fig. 93
Feitian EN 4.5 before treatment with broken and bent arms and feathers, broken and kinked *piaodai* and mounting from 1981-85; below the *feitian*: standing man EN 4.8.

Fig. 94
Feitian EN 4.6 before treatment. The figure is severely damaged: One head, the right arm, the left hand and the major part of the wings are missing. The preserved wires of the *piaodai* are broken and kinked. The thick wire around the waist is the fixation from 1981-85.

Tilted tianwang *and sagged cloud ledges*

The *tianwang* at the southern part of the upper tier tilted forward, maybe because of the distortion of the mountains or the crack running around their pegs. At *tianwang* EN 4.14, the peg had been pulled out of the wall on a length of about 2 cm. At *tianwang* EN 4.13, the connection between figure and wall is still intact, but the tilt becomes obvious at the elbow which, originally, had been attached to the mountain behind, but now is 4 to 5 cm in front of it (fig. 95). The right hand which is attached to the weapon shaft is broken off at the wrist. It cannot be reattached anymore because it is 1 cm higher than the arm and about 1 cm closer to the wall. The connection of both figures to the wall is stable now, they are not loose, and it is not possible to push them back towards the wall. The adjacent figure EN 4.12 is still firmly attached to the wall and seems unaffected by the tilt.

Probably the tilt of the figures resulted in a tilt of the cloud ledges Y 3 and Y 4. The substructure of the cloud ledges is not visible, but it probably contains straw or reed like the terraces or mountain ledges on other walls, and thus may be rather soft. By the tilt of the figures, the cloud ledges were pressed forward and downwards. This resulted in the break of the *piaodai* unfolding around the heads of *tianwang* EN 4.19 and 4.20 (standing below EN 4.13 and 4.14) and attached to the cloud ledges (fig. 96: white arrow). The preserved parts of the *piaodai* cannot be inserted anymore. The broken-off parts of the *piaodai* were found next to the figures. This may indicate that they broke off after the renovation from 1981 to 1985.

The *tianwang* in the left (northern) part of the wall does not seem to have tilted, but the figures of the upper tier could not be checked from behind.[17] *Tianwang* EN 4.10 is loose.

Fig. 95
EN 4.13 in 2011: The gap between right hand and wrist measures 1 cm in height. The figure tilted forward, the sleeve at the right elbow getting detached from the wall (here with temporarily inserted wooden block)

Fig. 96
Head of EN 4.20. At the cloud a mark is visible where the *piaodai* around the head had been attached (white arrow)

Pusa *4.22 and dais*

The situation of the dais with the pedestal of the *baoshen fo* and the two *pusa* standing on it could not yet be investigated closely. The inner structure of the dais is unknown. The situation on the right side, around *pusa* EN 4.22, was not investigated yet in 2011 and 2012. The upper part of the lotus pedestal is visible here, but the current level of the top of the dais also is too high.

Pusa EN 4.21 has 'sunk' into the broken surface of the dais. The lotus petals are finely modelled and painted, proving that originally they were visible, but in 2012 the lowest painted part of the lotus pedestal was found 7 cm below the surface of the new plaster applied in 1981-85. This repair plaster almost covered the lotus flower pedestal.
The surface of the dais seems to have been damaged already before 1981: Below the plaster applied in 1981-85, there is at least one layer of plaster which covers fragments with white paint. These may come from the original surface of the dais. Underneath the plaster from 1981-85, there were fragments of an older repair plaster containing clay and straw. Underneath and around these fragments, the interior of the dais around *pusa* EN 4.21 consists of clay powder and broken adobe bricks. At the foot of the original front, larger stones from the river (rounded shape) could be detected.
The thick wooden pole which served as the vertical axis of *pusa* EN 4.21, probably runs from the pedestal to the head. It protruded underneath the lotus pedestal and may have originally been supported by a stand modelled in clay (F 260, fig. 98). The pole is broken off and its end decayed, in 2012 it had no connection to the support anymore (fig. 97).

[17] It was not possible to reach the figures without relocating the bars of the scaffold. This could not be done because of lack of time.

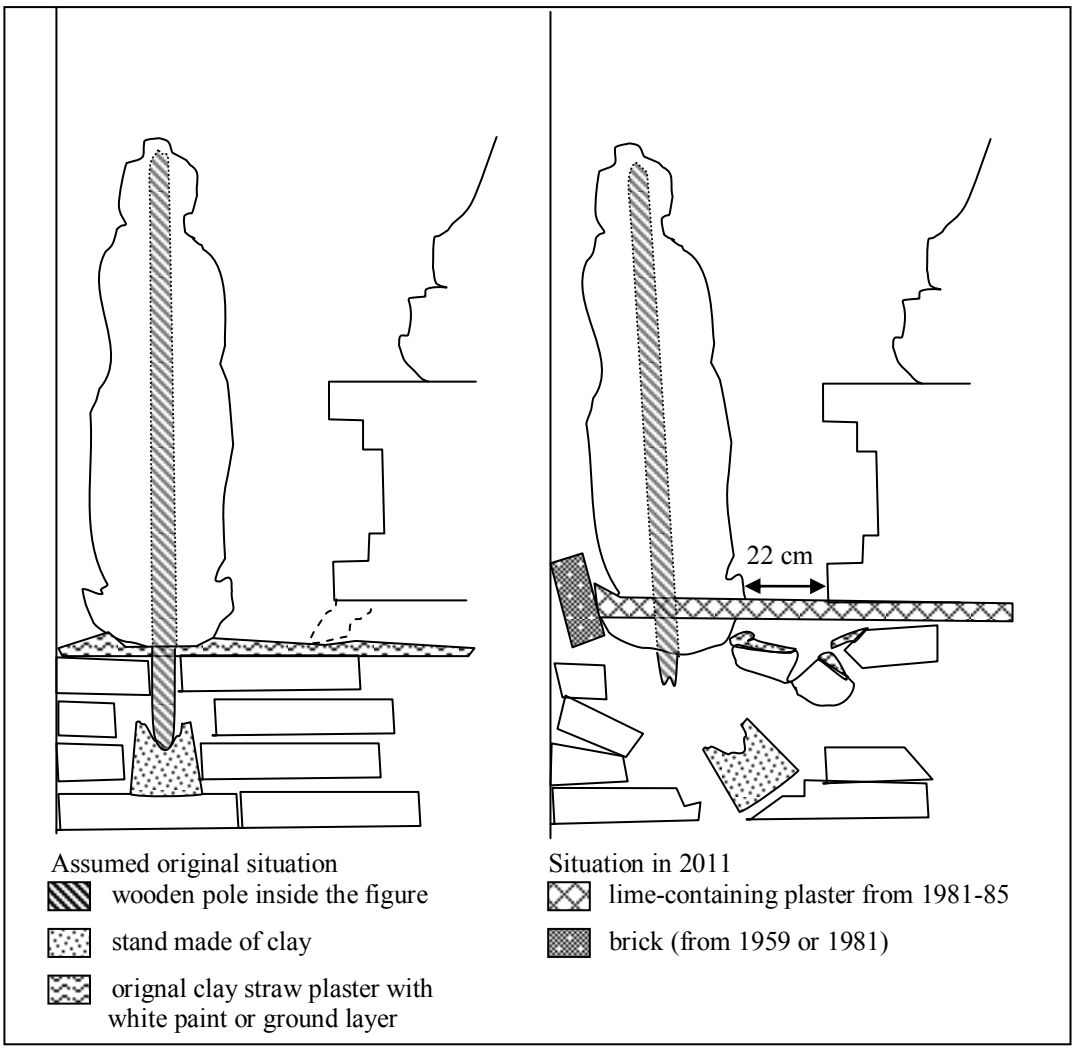


Fig. 97
Pusa EN 4.21: Schematic drawing of assumed original situation and situation in 2011

Fig. 98
Pusa EN 4.21: Clay elements unearthed in the debris of the dais underneath pusa EN 4.21: Top view and two sides, on one side deterioration caused by salts (?)

Fig. 99
Deteriorated wooden pole F 213, from debris behind *pusa* EN 4.21, maybe broken-off end of vertical pole

Tabular survey of damage

Damage to the preserved reliefs: Broken, bent, loose parts and other damage

Table 8
Damage to mountain scenery (upper part)

part	*damage*
EN 4.1 + peak of S 23	- figure together with modelling of mountain peak (S 23) loose, but not detached; position shifted (too much to the back and to the right now)
EN 4.2, *kongzi* + S 28	- gap between the layers of mountains in his back (S 28): width of gap between the mountain behind the upper pole and the mountain in front: 4 cm at the top of the mountains, and 1 cm next to upper pole - wire from 1981-85 cutting into the edge of mountain on his left side - *piaodai* around head cracked and instable - cloud above detached from bamboo pole, lying on the head of EN 4.2
EN 4.3, *shijiamouni*	- lopsided, maybe caused by unfitting alignment in 1981-85 or tension on the wire around bamboo pole behind his left hip - fragment of *piaodai* on right shoulder bent, modelling broken
EN 4.4, *laozi* + S 6	- crack between layers of mountains in front and behind the upper pole - upper wire from 1981-85 broke the edge of the mountain on his right side - lower wire from 1981-85 broke the central ridge of the front mountain - tip of cloud tail to the right of EN 4.4 (next to T 1) bent and broken - both hands loose - tails of cloud behind his elbows broken
EN 4.5, *feitian*, left side	- right head loose - both arms broken at elbow and at wrist - preserved wires of feathers and *piaodai* bent and kinked - mounting on lath from 1981-85 loose, thick wire around waist visually disturbing - connection to wall loose and visually disturbing because of thick wire and rough remodelling of mountain behind *feitian* - smaller mountain element behind EN 4.5, S 26, was re-used as background of *shijiamouni* EN 4.3 in 1981-85
EN 4.6, *feitian*, right side	- crack around the neck, head loose - preserved wires of feathers and *piaodai* bent and kinked - wire of *piaodai*, shoulder to hip, left side: bent, kinked (modelling missing) - mounting on lath from 1981-85 loose, thick wire around waist visually disturbing
EN 4.7, monk	- figure slid down from peg and got detached, still in place because figure is wedged into the corner - tip of cloak behind left sleeve bent and broken - feet loose, broken at ankles - knot of *kashaya* got detached during re-attachment of figure
EN 4.8	- remodelling of shins and feet from 1981-85 too short and shapeless, but stable
EN 4.23, corpse	- head loose - tip of small mountain element at his feet loose
GN 7.19a, monk	- slightly loose at the feet, but still in correct position; loose parts of clay core of mountain are wedged into joint - mountain terrace underneath the feet is broken
GN 7.19b, monk	- loose, connected to mountain with his left foot, leaning against the shoulder of GN 7.19a, wrong position (not attached to the terrace above anymore) - mountain terrace underneath the feet broken - left hand loose - left tip of cloak broken

Table 8 cont.

part	*damage*
EN 4 A 1, canopy	- all five arms bent - flowers on arms on the side are bent down - fragment of bead chain pendants on left side arm bent - fragments of bead chain pendants on central arm very fragile, breaks, bead tend to break into halves; connection of longest chain to arm with hemp fibres from 1981-85 very fragile
piaodai of canopy, northern (left) part	- remodelled part from 1981-85 not fitting in shape and accuracy, but stable - two fragments belonging into the remodelled area found behind EN 4.21
piaodai of canopy, southern (right) part	- bent out of shape - came off from left peg, hanging on hemp fibres from 1981-85, fragile, wrong position - connection to right peg loose
T 1, pagoda	- broken at base and slightly loose (not firm)
S 2 and 3	- damage to surface by wire from 1981-85 cutting into modelled surface
S 4, tree F 130	- tree F 130 found at the foot of the wall in Oct. 2011: broken off at beginning of trunk (wooden substructure broken)
S 5	- broken horizontally at the level of EN 4.23 and loose
S 9	- mountain disrupted vertically by forcing the lath for mounting *feitian* EN 4.5 through the reed bundle in 1981-85
S 10, tree	- tree trunk broken twice, loose around inner core
S 11	- tip loose, position slightly shifted above crack (*see: upper crack*) - remodelling rough and shapeless - remodelling covering the edge of S 33 (overlapping paint layer)
S 18	- mountain disrupted vertically by forcing the lath for mounting *feitian* EN 4.5 through the reed bundle in 1981-85
S 19	- remodelled peak of mountain above upper pole loose
	- lower part with monk EN 4.7 loose (no connection between clay and reed) - upper part with monk EN 4.1 loose, figure tilted forward and to the left
S 23 with EN 4.1 and EN 4.7	- modelling of mountain broken under the stress of the lower pole being pushed forward: -- reed bundle bulging forward in front of lower pole -- modelling broken into three parts: behind EN 4.7, above EN 4.7, behind EN 4.1 (no connection between clay and reed) -- mountain peak behind EN 4.1 slid to the back and to the right - middle part slid down and turned sideways (no connection between clay and reed) -- mountain part with EN 4.7 slid down, loose (no connection between clay and reed)
S 25	- standing loosely and instable on top of broken-off mountain behind EN 4.3 - original position not clear
S 26	- used upside down as background of *shijiamouni* EN 4.3 in 1981-85 - hanging left tip: part broken off when the cloud attached there in 1981-85 was removed
S 30	- broken horizontally next to EN 4.23, fracture edges not fitting
S 33	- broken horizontally at the level of EN 4.23, fracture edges not fitting
Y 5	- tail broken twice
Y 6	- tail broken twice
Y 7, cloud	- broken into two parts - nailed to mountain S 30 at a wrong position

Table 9
Damage on lower part of the wall (from top downwards)

part	*damage*
EN 4.9	- *piaodai* around head flattened by EN 4.1 standing on top of EN 4.9 - right arm broken at elbow - sleeve tip at right elbow broken - tip of *piaodai* attached to left foot with wire is loose - two *piaodai*, shoulder to hip, left side: broken and loose - two *piaodai*, hanging from hip, left side: broken and loose
EN 4.10	- figure loose - blade of halberd broken from wire frame, loose - left hand broken at wrist - *piaodai* around head: preserved wire at left shoulder very fragile - *piaodai*, shoulder to hip, left side: loose - *piaodai*, shoulder to hip, right side: loose - *piaodai* on chest: loose, partly broken - loop at belt: loose - the three preserved strands of hair are bent down, wire kinked
EN 4.11	- *piaodai* around head: preserved fragment on right shoulder kinked and bent down - *piaodai*, shoulder to hip, left side: broken, modelling partly missing - *piaodai*, shoulder to hip, right side: broken, modelling partly missing, tip bent, hanging loosely in front of cloud ledge, very fragile - *piaodai* hanging from hip, left and right side: loose, modelling partly missing - *piaodai* hanging in front of abdomen: loose
EN 4.12	- sleeve tip at left elbow bent and broken - *piaodai*, shoulder to hip, left side: bent and kinked, wire broken - *piaodai* hanging from hip, left side: loose; tip detached from shaft of weapon of EN 4.13 - crossguard of sword missing in 2011 (discovered in 2012 as finding F 184-1)
EN 4.13	- right hand broken at the wrist - right arm broken at shoulder and at elbow - left arm broken at elbow - *piaodai* around head broken, modelling loose - *piaodai*, shoulder to hip, left side: modelling of preserved part loose - *piaodai*, shoulder to hip, right side: modelling mostly missing, remnants loose - *piaodai*, hanging from hip, left side: distorted, loose, tip hanging in front of cloud ledge - *piaodai*, hanging from hip, right side: broken, remnants loose - *piaodai* (ring) in front of abdomen: modelling loose, partly missing - loops at belt: modelling partly missing (wire preserved) - elements on the helmet are bent down and kinked, smaller parts of modelling loose
EN 4.14	- crack at left shoulder - *piaodai* around head: broken off at shoulders, broken into several parts when touched - *piaodai*, shoulder to hip, left side: broken, wire broken, parts of modelling missing - white *piaodai* in front of abdomen: modelling loose, partly missing - *piaodai* on chest: bent, modelling mostly missing
EN 4.15	- left hand broken off at wrist (large gap) - *piaodai* around head: broken, major parts missing - *piaodai*, hanging from hip, left side: broken, modelling loose - loops at belt: bent - wire of lost decoration sticking into his face
EN 4.16	- *piaodai* around head broken, major parts missing, preserved wire bent - *piaodai* hanging from hip, right side: broken, loose; tip kinked, hanging in front of cloud ledge - *piaodai* on chest: bent, loose - headgear: hairpin bent and loose - "ball" at the handle of the weapon loose

Table 9 cont.

part	*damage*
EN 4.17	- *no damages*
EN 4.18	- *piaodai*, hanging from hip, left side: loose, parts missing - *piaodai* around head broken, fragmented - loop at belt missing (found in findings as F 22)
EN 4.19	- right hand: index and middle finger loose - two strands of hair kinked, modelling loose - *piaodai* around head broken off, detached part found behind figure (F 109) - *piaodai*, shoulder to hip, right side: bent, loose - *piaodai* hanging from hip, right side: detached, found behind figure broken into two parts - red *piaodai*-ring in front of abdomen broken, modelling loose
EN 4.20	- right arm broken at elbow, bent - sleeve tip at right elbow broken, loose - left arm broken at elbow - "strap" of belt at the hip loose - *piaodai* around head broken off, detached part found behind figure (F 110) - decoration elements on cap bent
wall between EN 4.20 and edge	- wall behind surface consists of clay powder; behind tip of tunic next to his left foot, there is a fired brick from a repair (1981-85)
EN 4.21, *pusa*	- crack around neck, but head stable - attribute reduced to wire with remnants of clay modelling - decoration on crown bent, partly loose, small parts detached or lost - flesh tone (face and hands) repainted - figure has sunk into dais; lotus flower pedestal not visible anymore (about 10 cm too low now), end of supporting vertical pole deteriorated - unsuitable stabilisation of the figure by a fired brick jammed between figure and wall in 1981-85 - inside the dais, the adobe or rammed earth have transformed into powder
wall behind EN 4.21	- upper part of wall plaster renewed in 1981-85 (clay + straw)
EN 4.22, *pusa*	- crack around neck, but head stable - decoration on crown bent, partly loose, small parts lost - fragment of bead chain pendant on crown broke off - decorations on the crown are bent down - flesh tone (face and hands) repainted - left hand broken at wrist (old repair), loose - attribute lost
wall behind EN 4.22	- crack system and voids in the wall on the left of the mountain - between mountain and southern edge of the wall plaster renewed in 1981-85 (containing lime + animal hair)
EN 4, *baoshen fo*	- hole in the sole of right foot - left hand: middle finger and middle finger broken, loose - remodelled small finger and ring finger of right hand slightly loose - right hand: thumb, middle finger and index broken, loose

Losses

Table 10
Losses in mountain scenery (see also fig. 78)

part	*lost part(s)*
EN 4.1, monk	- knot of *kashaya* next to left armpit - right ear - something on top of rectangular attribute (wire preserved)
EN 4.2, *kongzi*	- upper and lower end of the attribute in his left hand - cloud behind knees (just bamboo pole preserved), left and right side - cloud (?) below figure in front of bamboo pole - tail of green cloud above his head (upper cloud) - tip of tail of pink cloud above his head (lower cloud) - tip of tail of cloud behind his left elbow
EN 4.3, *shijiamouni* without detached elements of background	- fingers of right hand, maybe object in left hand and something around right hand - *piaodai* around the head (small part on right shoulder preserved) - pearl ? on top of *usnisa* (protuberance of the scull) - background of figure (probably mountain with clouds) - tail of cloud behind his head (Y 9a, nailed to corbel bracket) - cloud ? hiding bamboo pole below figure - clouds on which he is sitting (replaced in 1981-85)
EN 4.4, *laozi*	- major part of attribute in his hands (empty wire loop at the right part of his chest) - *piaodai* around head (nimbus) - something hanging from belt - cloud (?) below figure in front of bamboo pole - two clouds above head, attached to wooden pole inside the mountain - head of cloud next to left knee - part of head of cloud behind his right elbow - green cloud tail next to right knee (extant cloud tail belongs to green cloud in front of his knees)
EN 4.5, *feitian*	- parts of both hands - tips of feathers on right wing - parts of at least three feather tips on left wing - *piaodai* around the heads (wire partly preserved) - *piaodai* shoulder to hip: broken wires partly preserved, but bent - *piaodai* hanging from hip, left side and right side (wire of left side preserved partly) - headgear or hair covering the ears on both heads - tail and small ends of cloud behind skirt - original attachment to wall (wires cut, pegs lost) - rock elements between *feitian* and mountains S 18 and 19
EN 4.6, *feitian*	- left head - headgear over the ears of preserved head - left arm - hand of right arm - right wing - major part of left wing (bamboo pole and some wires from inside the feathers preserved) - *piaodai* around head - *piaodai* shoulder to hip: wires preserved, but broken and bent - *piaodai* hanging from hip, left and right side - right part of cloud behind skirt - lower wire for attachment to peg - rock element between *feitian* and S 8
EN 4.7	- tip of right shoe - part of cloud below left foot - right hand or attribute hiding the hand (wooden stick preserved)

Table 10 cont.

part	*lost part(s)*
EN 4.8, man	- shins and feet - something attached to both sides of cap - *piaodai* around head - object on table to the right of EN 4.8
EN 4.23, corpse	- legs - something at his feet in front of left edge of S 32 (*see S 32*)
4 B1, deer	- antlers lost before painting the deer ? - something attached to its mouth with thin wire
GN 7.19a	- peg
GN 7.19b	*nothing missing*
canopy	- two clouds on top of each other on northern side - gilded decoration above red ring, northern half - head of cloud-shaped arm left and right from centre - parts of the flower (?) on top of the heads of the side arms - modelling over wood protruding from tip of cover - major parts of hanging bead chain decoration
piaodai of canopy, northern (left) part	- part of *piaodai* in the middle (between the two pegs), replaced in 1981-85
piaodai of canopy, southern (right) part	- gilded element at the tip - part of *piaodai* in the middle (between the two pegs) - part of *piaodai* below canopy
S 1	- something missing next to beam (southern edge), maybe an elongated object (cloud ?) that stretched until next to T1 (*see S 30*) - lower edge of S 32 and S 1 broken off; new plaster (clay + straw) applied in 1981-85
S 2	- something standing on a place marked by five points on top of the mountain (maybe an animal with four feet, plus another object) - one tree below top
S 3	- one tree on southern peak of mountain ? (or just the tip of a bamboo pole from substructure ?) - something in front of left side of the peak, maybe stretching to tree on S 4 (*see S 4*)
S 4 and tree F 130	- something covering the tip of the leaves on the lower level of leaves of tree F 130, maybe stretching to S 3 (*see S 3*) - two branches in the lower level of leaves of tree
S 7	- one tree on peak
S 9	- object with flat back below tip, maybe cloud - one tree on right (southern) peak
S 10	- not-painted part of S 10 was probably covered by the wing of *feitian* EN 4.6 (wing lost)
S 11	- peak missing and remodelled in 1981-85
S 14	- peak missing (broken-off top covered with straw plaster in 1981-85)
S 15	- one tree on top of mountain
S 16	- peak lost, remodelled in 1981-85; on top of peak there may have been a tree
S 17	- peak missing and remodelled in 1981-85
S 18	- something below tip (tree standing on S 26? or cloud ?)
S 19	- tip above upper pole, remodelled in 1981-85 (remodelled over original reed bundle or completely replaced)
S 20	- tree missing on peak
S 21	- something behind the head of EN 4.10, stretching to hanging tip of S 24 (*see S 24*)

Table 10 cont.

part	*lost part(s)*
S 23	-- parts of modelling on the back fell down (lost)
S 24	- something at the level of *piaodai* of canopy (cloud ?) - something at the hanging tip of S 24, stretching to S 21 behind head of EN 4.10 (*see S 21*)
S 26	- lower part of hanging peak (ca. 10 cm) in front of S 18
S 27	- tree on top
S 30	- tree behind cloud Y 7
S 32	- something in front of upper right part - lower edge of S 32 and S 1 broken off; new plaster (clay + straw) applied in 1981-85 - something next to the feet of corpse EN 4.23
between GN 7.19b and S 23	- something missing: mountain?
above EN 4.14	- element, partly in front of cloud above EN 4.14
Y 1, Y 2, Y 3 (cloud ledges)	- upper part of stem of cloud (area next to T 2 covered with plaster, containing animal hair + lime, in 1981-85)
Y 5	- something missing in front of tail and the wall behind it
Y 8 (cloud below deer)	- bent tail of cloud
Y 9a (nailed to corbel bracket)	- tip of tail
Y 9b (detached in 2011)	- parts of tail
Y 15	- tip of tail
Y 16	- tip of tail

Table 11
Losses in lower part of the wall (also see fig. 78)

part	*lost part(s)*
EN 4.9	- right hand (+ weapon?) - *piaodai*, shoulder to hip, right side, major part - *piaodai*, hanging from hip, right side, lower part - *piaodai* coming from somewhere, ending in front of left leg (only tip preserved) - something on left elbow (wire preserved) - some elements on cap (wire preserved)
EN 4.10	- tips of hair strands - *piaodai* around head (part of wire on right shoulder preserved) - *piaodai*, hanging from hip, left and right side: lower part - *piaodai*, ring in front of abdomen: parts of ties
EN 4.11	- *piaodai* around head, major part (original colour either light grey or green) - *piaodai*, shoulder to hip, left side: parts of modelling (wire preserved) - *piaodai*, hanging from hip, left side: lower part - small decorations on the sides of cap
EN 4.12	- *piaodai* around head (green) - *piaodai*, shoulder to hip, right side - *piaodai*, hanging from hip, right side - *piaodai*, hanging from hip, left side: tip and parts of band - decoration on headgear (three thin wire ends preserved)

Table 11 cont.

part	*lost part(s)*
EN 4.13	- *piaodai*-ring in front of abdomen: parts of the ends of the *piaodai* - *piaodai*, hanging from hip, right side: tip
EN 4.14	- right hand (+ attribute ?) - fingers of left hand - *piaodai*, hanging from hip, left and right side - *piaodai*, in front of abdomen: parts missing - element on the side of the cap
EN 4.15	- right ear - *piaodai* around head: major parts missing - *piaodai*, shoulder to hip, right side - elements on the cap
EN 4.16	- *piaodai* around head, major part missing
EN 4.17	- tip of little finger, right hand - strands of hair - something hanging from right wrist - *piaodai* around head (green) - *piaodai*, shoulder to hip, left and right side - *piaodai*, hanging from hip, left and right side
EN 4.18	- *piaodai* around head - *piaodai*, shoulder to hip, left and right side - *piaodai*, hanging from hip, left and right side
EN 4.19	- spherical attribute in his left hand - ring finger and little finger, right hand - two strands of hair - parts of white *piaodai* hanging from the belt at the hips - red *piaodai*, in front of abdomen: parts of ring missing - *piaodai*, hanging from hip, right side: tip
EN 4.20	- left hand - right hand (+ weapon ?) - *piaodai*, shoulder to hip, left and right side - *piaodai*, hanging from hip, left and right side - something in front of abdomen (*piaodai*-ring ?): wire loop for attachment preserved - something on chest (*piaodai* ?), wire loop and ends of wire preserved - something (tie ?) at the belt buckle - elements of decoration on cap
EN 4.21, *pusa*	- fingers of left hand - part of attribute in the right hand: originally twig with leaves and fruits ? - some elements of decoration of crown - bead chain decorations hanging from crown - peg and original connection to the wall (modelled mountain ?) - band from crown to shoulder: right side, part on the left side
EN 4.22, *pusa*	- fingers of right hand - part of attribute in the left hand: originally twig with leaves and fruits ? - knot of tasselled rope next to left collarbone - band from crown to shoulder: left side; part on the right side
EN 4, *baoshen fo*	- ring finger and little finger of right hand (the existing ones are replacements)
pedestal of *baoshen fo* EN 4	- feet - decoration on lowest (1) and topmost step (5) except for fragment on southern side of (5)
behind head of EN 4.10	- something missing, probably a cloud
cloud ledge Y3 next to 4.14	- “stems” swinging upwards to next level: upper part; damaged places closed with new plaster (containing lime+ animal hair) in 1981-85
cloud ledge Y1 next to 4.20	- “stems” swinging upwards to next level: upper part; damaged places closed with new plaster (containing lime+ animal hair) in 1981-85

CONSERVATION TREATMENT

October 17 to November 16, 2011

After a first visit and assessment of the situation on October 9, the scaffold was ordered and put up in front of the EN wall and around the column that is standing 3 m in front of its southern end, so that the southern side of the wall could be reached too. The top level of the scaffold exceeded the highest tips in the mountain scenery (mountain peaks, tree on S 10 and clouds above the heads of EN 4.2, 4.3 and 4.4).
Before starting the conservation treatments, options and approaches were discussed on October 24. It was decided that the first step of the work should be the fixation of the mountain scenery including the replacement of the wires from 1981-85, and the stabilisation of the position of the upper and lower pole. The second step should be the re-attachment and conservation of figures and other elements in the mountain scenery and the gluing of the fingers of the *baoshen fo*. As far as time would be left, the conservation of broken and loose elements should be continued in the lower parts of the wall. A treatment of the surface including detailed cleaning, removal of residues and consolidation of paint layers was not planned.
Another precondition was discussed after beginning the work: The experts of the Shaanxi Institute for Conservation insisted that temporary fixations (pins, strings, wedges etc.), installed either as preliminary support before the treatment or as fixation during the drying period of the clay suspensions, had to be removed at the end of the work. Therefore sufficient time for drying had to be included in the schedule. This lapse of time became successively longer as the weather became colder and wetter. Therefore it was not possible to re-attach bigger elements with clay suspension during the last week. The re-attachment of *feitian* EN 4.5 was postponed to a later work stay. During the last two weeks it became obvious that the conservation of the broken and loose parts in the lower part of the wall could not be finished. At that time the decision was made to finish the right (southern) part of the *tianwang*, and leave the left (northern) part, the *pusa* and the pedestal of the *baoshen fo* for a later work stay.
In another meeting of scientists from the Shaanxi Institute for Conservation, Zhao Liang and the German restorers, the choice of materials was discussed in general. For the Chinese side, the guideline is to use traditional materials wherever it is possible and to carry out repairs with the same materials and techniques as used for the original. For this reason, Tylose MH 300 (methyl ethoxyethyl cellulose) should not be used as additive for clay mixtures. Animal glue (*ming jiao*) was proposed as alternative by the Chinese side. The German restorers suggested that it should not be used without preceding tests in the laboratory. They also pointed out that animal glue has not been confirmed as additive in the analyses, although it cannot be excluded (animal glue found in the surface of the clay seems to come from an isolation layer rather than being an additive). In the end, no organic additive was added to the clay, although an increase of the adhesive strength of the clay mixtures used for gluing and filling was regarded as desirable. Mechanical fixations should be made with the same material as in the original: hemp strings replacing hemp strings, bamboo or wood for inner cores etc. Wires should only be used: a. if unavoidable, b. on the back, c. to replace the wires from 1981-85. Stainless steel devices should be used in order to minimise problems caused by metal corrosion. Fillings should be made with the same mixtures as at the wall (clay with straw or clay with fibres and sand). The only difference was to replace sand with inorganic materials of lower weight, such as micro-balloons or pumice, for grouting or stabilisation by injection. Fillings and completions should only be done to stabilise preserved parts. In principle, older completions should not be touched, but they should be reduced or even removed if they were covering originally painted surfaces or if it would be necessary for reasons of conservation.

Exemptions from these rules were discussed for each case and only accepted if there was no other solution.
During the working period, temperature and humidity were measured inside and outside. The measurements were done with small electronic hygrothermometers which are not very precise especially with regard to humidity measurement, but they are exact enough to understand the tendencies, furthermore they are cheap, small and light. The measurements showed that there are no divergences on different positions in so far as they are taken at the same level: The climate next to the doors was the same as in the North-West corner. There are slight altitudinal differences, the lower levels being cooler and moister. Below the roof, the changes and the divergences from the other measurements were the greatest, because the air passes through gaps between the rafters and the influence by the outside climate is stronger. Like in previous measurements, a very stable climate was recorded inside the temple hall, almost without fluctuations caused by the course of the day or sudden weather changes.

Based on these discussions and decisions, the treatments comprised the following steps and scheduling:
1. Removal of dust and loose accumulations of coarser materials, and collection of detached fragments (*see: 6 Findings, in this report*) from and at the foot of the wall
2. Fixation of the mountain scenery to the wooden construction behind including the removal of the fixations made in 1981-85 and, as far as necessary, fixation of the upper and the lower pole
3. Re-attachment of loose figures and elements in the mountain scenery (S 23 with monks EN 4.1 and EN 4.7, monks GN 7.19 a and GN 7.19 b, *feitian* EN 4.5 and EN 4.6, pagoda T 1)
4. Conservation of broken and loose parts of the figures (*piaodai*, hands, broken clouds etc.) in the mountain scenery
5. Conservation of broken and loose parts of the canopy and its *piaodai*
6. Conservation of broken and loose parts of the figures in the lower part of the wall (*piaodai*, arms, hands, strands of hair)

Fig. 100
Work at the back of the mountains from above, lying on the topmost layer of the scaffold

The general procedure and complicated interventions are described in the following. All treatments listed according to figures or parts can be found in the *Tabular overview of treatments* at the end of this chapter (p. 156-172).

August 6 to August 30, 2012

The aim of the conservation carried out in three and a half weeks in August 2012 was to finish the work started in 2011. The main aspects still to solve were:
- lifting *pusa* EN 4.21 and rebuilding the broken dais underneath his pedestal
- conservation of the beaded chain elements with corroded wires

Furthermore, it was intended
- to complete the conservation of the six *tianwang* on the northern side of the *baoshen fo*, EN 4.9-4.11 and 4.15-4.17, which could not be finished in 2011, to check the state of all parts treated in 2011, and to improve the conservation of parts where only provisional solution could be realized in 2011, for example the treatment of wires and elements with wire cores.
- to check once more the numerous findings in the hope of assembling a lot of them to larger elements and of assigning and re-attaching some of the about 500 fragments discovered in 2011.

It was also expected to find more fragments in the debris still present underneath and behind *pusa* EN 4.21.

Accompanying the conservation, a series of tests was made to modify the clay mixtures used for gluing and grouting. There were three aims of these tests:
- In the previous years the observation had been made that the mixtures used for gluing broken parts had often been not strong enough, as a result of which the breaks had opened again.
- Considerations on the properties typical for cellulose ethers regarding their long-term stability. Besides the sensitivity to microbiologic attacks, the significant swelling caused by contact with liquid water (and shrinkage resulting from loss of water) seemed problematic because of the high humidity that occurs seasonally inside the hall. Furthermore, tests with new adhesives should also show if a material with a higher adhesive strength than Tylose MH 300 could be found.
- Pumice powder as inert additive should be compared to glass micro-balloons. Pumice powder had been used in 2011, but without systematic tests to compare it to the materials used so far (sand, glass foam, glass micro-balloons). As a porous material, pumice takes up more water than micro-balloons do and the weight is higher, two disadvantages regarding the ideal properties of grouting and filling materials. On the other hand, the mixtures were supposed to be more stable with regard to mechanical stress. Contrary to glass foam (like Poraver® products used in 2007), mixtures with fine pumice powder can be injected through thin tubes and even rather thin cannulas. The tests were planned to be carried out on-site because in this way it would be possible to test the same clay as used on the wall.[18]

[18] The storage of clay used for the experiments in 2008 and 2009 in Munich and China, had been used up in the Shuilu'an, so new clay was procured. Although the clay was always taken from the surroundings of Shuilu'an, each batch of clay differed slightly from the previous ones, regarding colour, shrinkage and adhesive strength.

Removal of dust and accumulations of other materials

The first step of the work in 2011 was the removal of debris and dust in the upper part of the wall. As the accumulations measured up to several centimetres on horizontal surfaces, the removal was necessary even to assess the damage situation. In the mountain area the surfaces were also cleaned from the back as far as it was possible to do so from above.
From above, lying on the topmost layer of the scaffold (fig. 100), the parts deep down behind the mountains could not be reached by hand. In addition, the space between and behind the mountains often narrowed to gaps which are too narrow and too deep to insert a hand. A flexible grab tool with a claw to pick up objects was used to extract parts from these narrow spaces. Though the small grab tool can not lift heavy objects, it was very useful to remove all kinds of dirt or to retrieve small tools as paint brushes or spatulas.
The pipe of the vacuum cleaner was extended with flexible tubes of various sizes. This allowed to leave the heavy vacuum-cleaner on the floor and to reduce the suction power so far that it could not break fragile parts (fig. 101). The long flexible tubes made it possible to use the vacuum-cleaner behind the mountains too.
Thick layers of dirt and dust were collected by the hands, spoons and the flexible grab tool. Afterwards all the surfaces were cleaned with a soft paint brush and a vacuum cleaner. Very fragile parts as the broken *piaodai* were omitted to prevent further damage.
As fragments of the modelling were embedded in the dirt, the collected dirt and the contents of the vacuum-cleaner bags were sieved before throwing them away. The use of a gauze or mosquito net in front of the tube opening was not practicable because fibrous particles in the dirt immediately blocked the gauze. Fragments of beads (from the beaded chain pendants), *piaodai* and other small objects which had been invisible in the layers of dust were retrieved this way.
Besides fragments of the modelling, bones of rodents, dead insects, lumps of plaster and mortar, roofing fabric and excrements of animals were found. Numerous bills and coins were transferred to the offertory boxes.
The upper part was cleaned first to start the conservation of the mountain area. The lower part was cleaned after most of the work in the upper part had been finished. During and after the work, parts of the wall had to be cleaned again because the work on the wall produced or dispersed dust.
In 2012, the major part had to be cleaned again using brushes and vacuum cleaner before the consolidation work could be started. The new accumulation of dust was visible, but minimal compared to the situation before cleaning in 2011.

Fig. 101
Cleaning by paint brushes and vacuum-cleaner. Flexible tube attached to the vacuum-cleaner pipe. Thick layers of dirt have accumulated on top of the canopy cover, obscuring the modelling and the white paint layer. A section of the beaded chain pendants is lying in the dirt layer.

Fig. 102
Tianwang EN 4.11 before removal of dust

Fig. 103
Tianwang EN 4.11 after vacuum-cleaning

Fixation of the mountain scenery

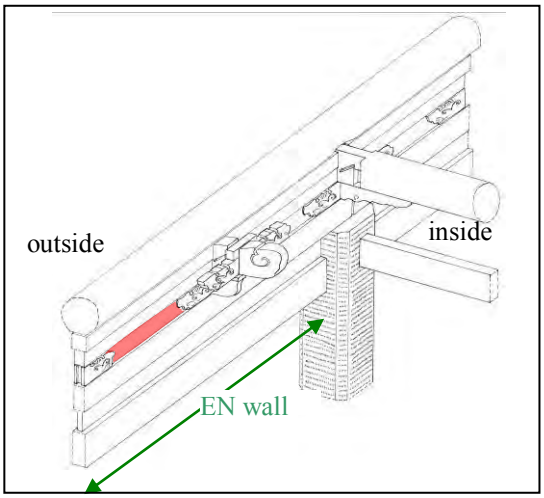
Preparatory step: Temporary removal of panel (10) from the wooden construction

It was very difficult to reach the back of the mountains from the inside of the wall, because this was only possible from above, lying face-down on the topmost layer of the scaffold (fig. 100). An examination of the wooden construction from the outside showed that the decorated front part of the bracket arm in which the upper panel (construction element no. 10 in the numbering of the wooden construction, fig. 107) was inserted at the corner column, was broken off and held in place only by thick layers of paint. After removing the paint, the bracket arm could be taken out, and the panel (10) could be pulled out (fig. 104).

Fig. 104
Removal of panel (10) from the outside

Fig. 105
View from outside after removal of panel (10): The back of the mountains and the upper pole are visible; on the left side the arms of the corbel bracket behind *shijiamouni* EN 4.3.
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 106
Working in the gap of panel (10) from the outside
[Gao Yan, Shaanxi Institute for Conservation]



◄ Fig. 107
Position of panel (10) in the wooden construction, view from inside

The removal of panel (10) opened a gap of 18 cm in height in the wooden construction between the northeast corner and the middle of the wall. Through the gap, the back of the mountains at the level of the upper pole was visible (fig. 105). A rather skinny person could

even squeeze his upper body into the gap and thus work on the mountains from the back (fig. 106).
The corresponding panel in the southern part of the wall could not be taken out without damaging the wooden construction. Panel (10) was broken in the middle and has to be glued when it will be reinserted definitely.

Fixation with steel hanging wires
The central idea was to attach the mountain scenery to the wooden construction of the hall, and with this to stabilise and support the mountain scenery as a whole. In his report, Yang Qiuying had proposed an attachment at the upper and the lower pole at evenly spaced positions, distributing the stress and preventing further tilting. Although the devices were not discussed in detail, wires were regarded as suitable material. This meant repeating the fixation system inserted in 1981-85, but using better materials and devices. In practice, the positions for the wires had to be chosen according to the condition of the modelling. As the wires should not be visible and the modelling should not be damaged by installing them, they could only be inserted in damaged areas or where holes had been drilled for this purpose in 1981-85. An additional problem was the accessibility: Wires could only be attached if it was possible to reach the respective spot with arms and tools.
Besides attaching the poles, loose or endangered mountains and figures, too, were stabilised with wires attached to the wooden construction. This had already been done in 1981-85 for the figures EN 4.1 to 4.4 and EN 4.6. In 2011, wires were also used for stabilising the figure EN 4.7 and the mountains EN S 5, S 11 and S 29. The wires only serve as an additional support for the parts re-attached with clay mixtures.
In general, all the metal elements used for the conservation should be made of stainless steel in order to prevent problems caused by corrosion of metal in future. Hanging wires, pipe clamps and turnbuckles made of stainless steel were brought from Germany for that purpose. A clamping band was only available as zinc-plated version. During the work it became evident that more than the calculated number of turnbuckles was required. As it was not possible to buy any turnbuckles made of stainless steel in Xi'an, four galvanised (zinc-plated) ones were used on wires with low tension (fixations no. 3, 11, 14 and 15, see table 12). In 2012, all steel wires were coated with Paraloid B 48 N to prevent corrosion. The three galvanised turnbuckles were exchanged against stainless steel ones bought in Germany.
The diameter of the hanging wires (0.5 mm, 1.0 mm or 1.5 mm) was chosen according to the required tension or the weight of the element. Loops were made of crimped ferrules consisting of zinc-plated copper. Turnbuckles, either with hook and eye or with two jaws (shackles), were used to apply tension. Wires which did not need tension were attached by screws. Each wire fixation was numbered and photographed. Figure 109 and table 12 give a survey of the positions of the hanging wires and the devices or the construction used for the fixation.
Most of the fixations were attached to *fangmu* (2) instead of beam inserted in 1981-85, because the lower position of the *fangmu* supplied a better suited angle. Only two fixations, nos. 3 and 14, were attached to beam (1). Five fixations at the southern end of the wall which required a lower level were attached to beam (3) of the wooden construction (fixations nos. 16 to 20) by screws.
The two poles were stabilised by hanging wires. The fixations of the upper pole (4) are marked orange in fig. 109. The upper pole was attached to *fangmu* (2) at five rather evenly spaced positions (fixations no. 2, 6, 9, 11 and 15). The fixations around figures EN 4.2, 4.3 and 4.4 (fixations nos. 5, 8 and 13) are an additional support to the upper pole. The fixations of the lower pole (5) are marked red in fig. 109. The lower pole (5) could not be reached from above the mountain scenery. Measures to stabilise its position had to be executed from the outside through the gap of the removed panel (10): Three wires were attached at the northern end of the pole and connected with the beams (3) or (1) (fixations nos. 3, 19 and 20, fig. 111).

At its southern end, the pole was connected to beam (A) with a clamping band to prevent it from sliding forward. To supply an additional support for the southern end, beam (1) was attached to the purlin with a clamping band, and in the same manner the *fangmu* was connected to beam (1).
The fixations of figures and mountains are marked blue in fig. 109. At the figures EN 4.2 to 4.4, the hanging wire replaced wires inserted in 1981-85. At *kongzi* EN 4.2, the hanging wire (fixation no. 5) was threaded through the hole drilled through the mountain flanks and behind the back of *kongzi* in 1981-85. Bamboo slips were inserted at the edge between flank and front to prevent the wire from cutting into the edges of the clay modelling (fig. 114), a problem which had occurred with the wires from 1981-85. At *laozi* EN 4.4, in 1981-85, the wire had been threaded through holes drilled through the mountain behind the back of the figure and through the southern mountain flank, and carried around the mountain at its northern flank. This damaged the ridges of the three mountain layers. In 2011, a hole was drilled through the northern flank of the mountain (fixation no. 13) to prevent further damage to the modelling of the mountain. At the edge between flank and front, bamboo slips and additionally headless steel screws were inserted between wire and modelling. Different from a steel pin with a smooth surface, the screw threads cannot slip and fall out if the tension of the wire changes slightly. The bamboo slip underneath prevents wire and screw from cutting into the clay modelling (fig. 115).
At *shijiamouni* EN 4.3, the situation was more complicated as two strings of wire from 1981-85 were embedded into the remodelled and completed part behind the sculpture. This completion covers original parts. It is not possible to see how much of the original modelling is preserved underneath the completion and where exactly the wires are running without removing the completion. In 2011, a wire (fixation no. 8) was threaded, from behind the *shijiamouni*, underneath the completed part and carried to his back again where it was closed to form a loop (figs. 117 and 118). Another wire was attached to this loop, carried around the sides of the corbel bracket and fixed with a turnbuckle on top of the corbel bracket (fig. 116). This construction prevents pressure on the broken mountain remnants behind the figure. Another wire (fixation no. 7) was attached to the pegs in the knees of the figure. After that the wires from 1981-85 were cut through, but not removed from the completed part.
The wire fixation at mountain S 23, with figures EN 4.1 and 4.7, and at *feitian* EN 4.5 are described below (see: *Re-attachment of loose figures and elements in the mountain scenery*).
Wire fixations were also used for two mountains which were broken, loose and tilting forward. Both mountains were stabilised by injection of clay suspension. The wires serve as additional fixation. At mountain S 11, a groove was dug into the remodelled tip from 1981-85. After inserting the thin hanging wire (fixation no.12), the groove was filled again. The wire prevents the still fragile mountain tip from tilting forward and to the right. The loose mountain S 5 was stabilised by drilling a hole through it and inserting a hanging wire to affix it to the wall. On the front, the hanging wire was attached to a bamboo cotter pin which is hardly visible behind figure EN 4.13 (figs. 119 and 120).
The wire inserted around mountains S 2 and S 3 in 1981-85 was removed and not replaced. The same goes for the wire below EN 4.4. In both cases, the stability of the mountains or of the figure did not require the reinsertion of a wire fixation.
Areas of lost modelling on the back of the mountains were completed with a clay-straw mixture. Fragments of the original modelling found behind the mountains were not re-used, because their position could not be identified in the remaining short time.

Tab. 12
Overview of position of hanging wires and devices used for the fixation of poles, figures and mountains in 2011
Devices are made of stainless steel except where otherwise stated. In 2012, the galvanised turnbuckles were exchanged against stainless steel ones.

hanging wire no.	*attached at (part to be fixed)*	*attached to (supporting element)*	*devices*	*tension ++ /+/0*
1	around top of mountain S 23 behind EN 4.1	*fangmu* (2)	wire 1.0 mm, no padding	0
2	around pole 4, between mountain S 23 + S 22	*fangmu* (2)	wire 1.5 mm + turnbuckle with hook and loop	++
3	around lower pole (5), between mountains S 23 + S 22	beam 1981-85 (1)	wire 1.5 mm + galvanised turnbuckle with hook and eye	+
4	through mountain S 23 + through upper pole (4)	upper pole (4)	wire 0.5 mm	0
5	round/through 4.2	*fangmu* (2)	wire 1.5 mm + turnbuckle with hook and eye + bamboo pad	+
6	round pole 4, between mountains S 18 + S 17	*fangmu* (2)	wire 1.5 mm + turnbuckle with two jaws	++
7	pegs in the knees of 4.3	above corbel bracket	wire 1.0 mm	0
8	from behind EN 4.3, underneath the cloud underneath EN 4.3	top of corbel bracket	wire 1.5 mm for loop and attached loop + turnbuckle with two jaws	+
9	around pole 4, between EN 4.3 + mountain S 10	*fangmu* (2)	wire 1.5 mm + small turnbuckle with hook and eye	++
10	around EN 4.6, along peg of EN 4.6, peg fixed to pole 4 by clamping band (perforated)	peg of EN 4.6	wire 1.0 mm + pipe clamp + clamping band + paper padding round EN 4.6	0
11	round upper pole (4), between S 7 + EN 4.4	*fangmu* (2)	wire 1.5 mm + galvanised turnbuckle with hook and eye	++
12	around top of mountain S 11, below upper pole (4)	*fangmu* (2)	wire 1.0 mm	0
13	through EN 4.4	*fangmu* (2)	wire 1.5 mm + turnbuckle with hook and eye + bamboo pad + steel screw as cotter pin	+
14	through mountain S 5, fixed with bamboo splint, below pole (5)	beam 1981-85 (1)	wire 1.0 mm through mountain + galvanised turnbuckle with hook and eye	+
15	around right end of upper pole (4), behind S 2	*fangmu* (2)	wire 1.5 mm + galvanised turnbuckle with hook and eye	++
16	around mountain S 29	beam (3)	wire 1.0 mm + screw into beam (3)	0
17	back of monk EN 4.7, through mountain S 23	beam (3)	wire 1.0 mm: with wooden pin in the back of monk + turnbuckle with hook and eye + thick screw into beam (3)	+
18	wire between EN 4.7 + mountain S 23, combined with pipe clamp round back of mountain S 23	beam (3)	pipe clamp with metal sheet and blotting paper padding + turnbuckle with hook and eye + thick screw into beam (3)	+
19	round pole 5, between mountains S 23 + S 22	beam (3)	wire 1.5 mm + turnbuckle with hook and eye + thick screw into beam (3)	++
20	screw hook into back of lower pole (5), between S 20 + S 19	beam (3)	wire 1.5 mm + small turnbuckle with hook and eye + thick screw into beam (3)	++

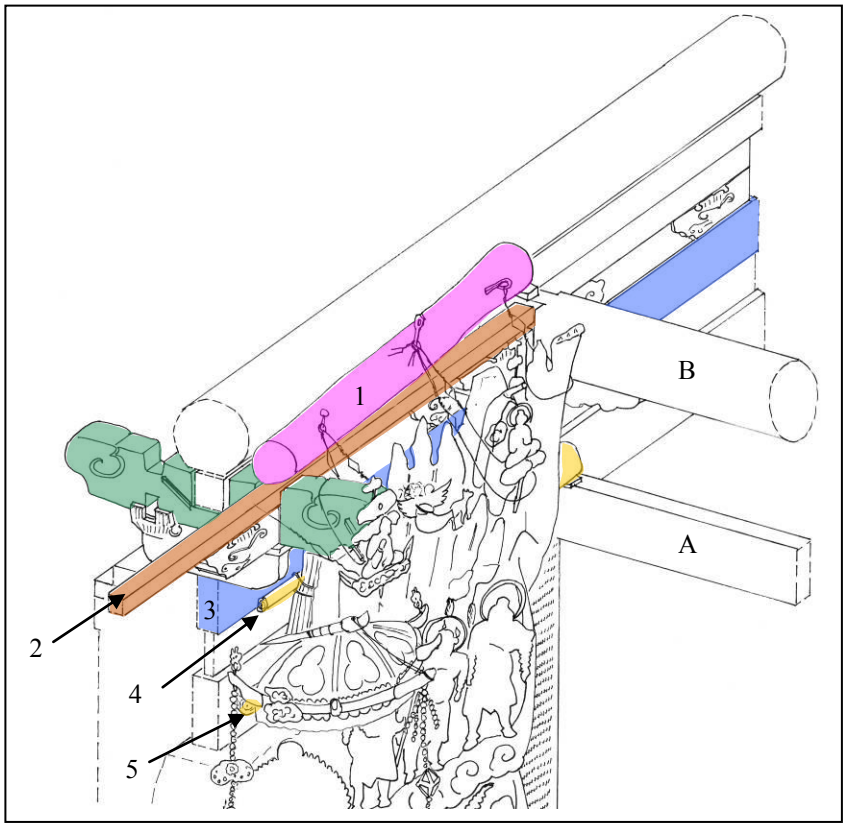


Fig. 108
Sketch of EN wall. Parts used for fixation by wires are numbered according to numbering system of 2011 and colour-coded:

beam (1)	
from 1981-85	pink
fangmu (2)	orange
beam (3)	blue
poles:	
upper pole (4)	yellow
lower pole (5)	yellow

▼ Fig. 109
Schematic sketch of wires inserted in 2011
orange = fixation of upper pole; red = fixation of lower pole; blue = fixation of figures and mountains
Numbering of wires: see: table 12.

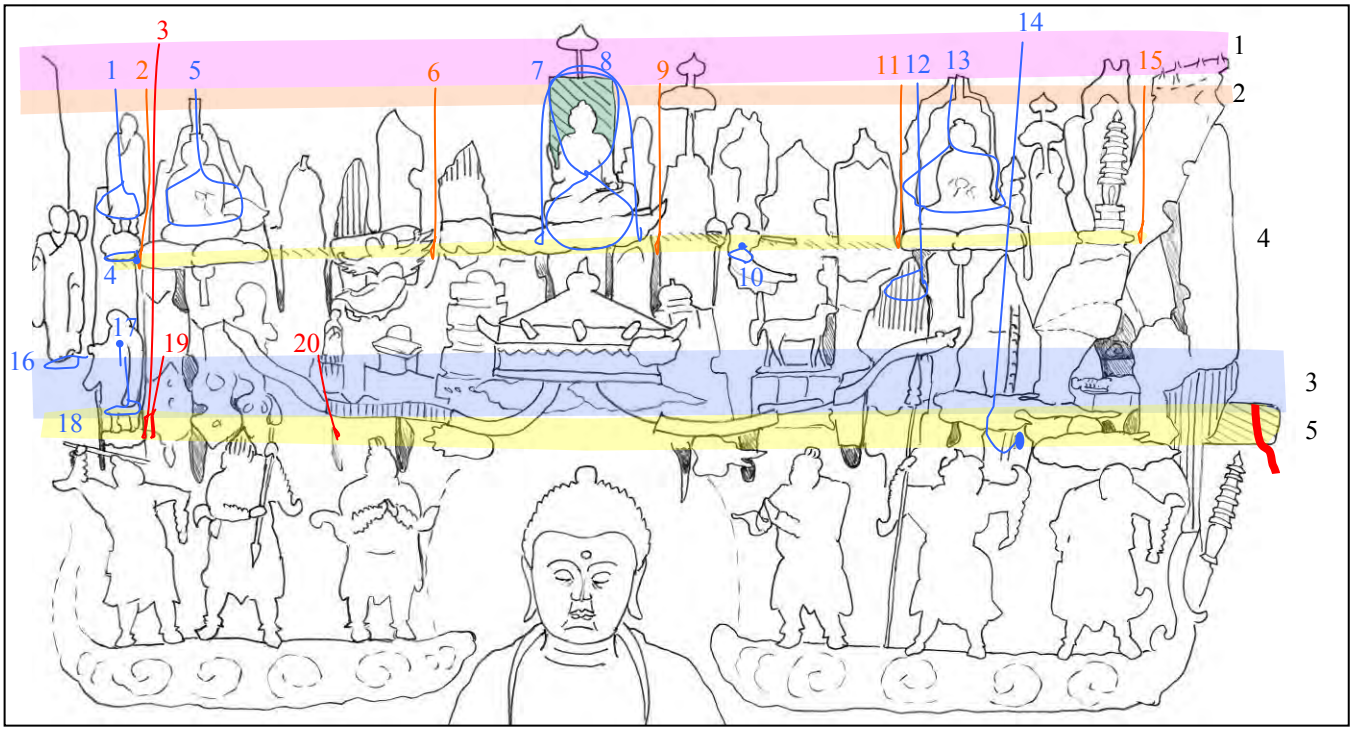


Fig. 110
Inserting a steel hanging wire and a turnbuckle (fixation no. 6)
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 111
Fixations nos. 16 to 19 attached to beam (3); iron angle for the fixation of peg of EN 4.7 (white string in the front is a temporary fixation)

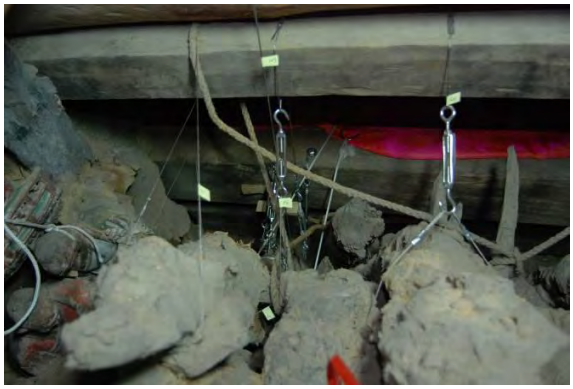


Fig. 112
Fixations nos. 1 to 5 behind mountain S 23 with EN 4.1 and *kongzi* EN 4.2

Fig. 113
Fixations nos. 11 to 15 (behind S 11 and *laozi* EN 4.4)

Fig. 114
Wire fixation through mountain behind *kongzi* EN 4.2 with bamboo slips underneath wire
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 115
Wire fixation through mountain behind *laozi* EN 4.4 with bamboo slips and screw underneath wire

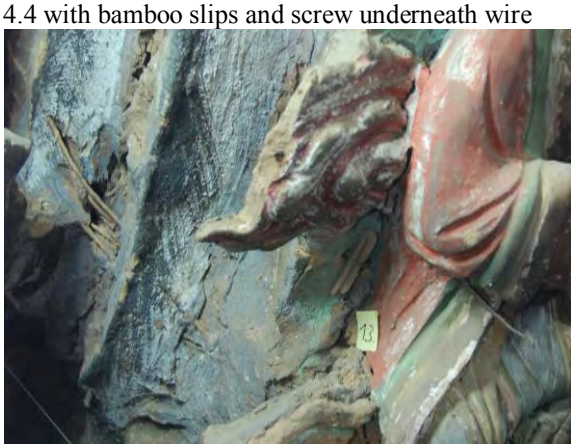


Fig. 117
Wire loop (fixation no. 8) behind *shijiamouni* EN 4.3

Fig. 116
Attachment of fixation no. 8 to corbel bracket, fixation no. 7 around the pegs of EN 4.3 and fixation of upper pole no. 9

Fig. 118
Fixation no. 8 underneath *shijiamouni* EN 4.3

Fig. 119
Fixation of mountain S 5 behind *tianwang* EN 4.13 and 4.14 (fixation no. 14)
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 120
Bamboo pin closed up with attached wire of fixation no. 14 in mountain S 5
[Gao Yan, Shaanxi Institute for Conservation]

Re-attachment of loose figures and elements in the mountain scenery

The next step, following the fixation of the mountain scenery, was the stabilisation and re-attachment of loose figures and elements in the mountain area. The figures of *kongzi* EN 4.2, *shijiamouni* EN 4.3 and *laozi* EN 4.4 were stabilised by the wire fixations of the mountains in their backs (*see above*). The connection between figures and mountains was stable.
The pagoda T 1 which is broken at its base was supported by a brass wire: it was attached to the bamboo pole sticking out at its tip and carried to the tip of mountain S 3 behind.
The cloud Y 7 had been nailed to mountain S 30. It is certain that the cloud did not belong there originally (behind the cloud there is the stump of a lost tree). Moreover, the cloud had been broken along one of the two nails used for the attachment in 1981-85. Therefore it was taken off. The broken parts were aligned and joined together. As the original position could not be ascertained, the cloud was stored in the cardboard boxes used for the findings.
Complicated interventions for re-attachment and stabilisation concerned some figures which will be described in detail:
- mountain S 23 with monks EN 4.1 and EN 4.7
- monks GN 7.19a and GN 7.19b
- *feitian* EN 4.5 with mountain S 26 and *feitian* EN 4.6
- A special case, which is connected to the re-attachment of the *feitian*, is the dismantling of the background of *shijiamouni* EN 4.3.

For aligning, re-attaching and filling of cracks, clay-based suspensions and mixtures were used. The basic material was "black earth"; as additives straw, pumice, sand, fibres from hemp paper (*mazhi*) were used, depending on the required purpose. For the recipes of the mixtures: *see: Recipes of clay mixtures,* in this chapter.

Mountain S 23 with monks EN 4.1 and EN 4.7
Mountain S 23, with the two monks EN 4.1 and EN 4.7 attached to it, was the most seriously damaged area of the wall and required a time-consuming and complicated conservation treatment. Besides the difficulties resulting from the type of damage (broken parts shifted or slipped down and detached), the position in the north-eastern corner was an additional challenge because there is a very small space left for working, and the position of S 23 was difficult to reach from all the levels of the scaffold. This required the installation of temporary lifting and stabilisation devices to move and hold the parts in the correct position.

Monk EN 4.7 had already got detached from the wall and was taken down (fig. 123). The peg remained inside the mountain. A part of the broken mountain proved to be connected with the back of the lower body of the figure and was therefore removed with it (fig. 125). Behind that part of the mountain, the lower pole became visible (fig. 124). Before the monk was re-attached, the lower pole was stabilised by two wire fixations (fixations nos. 3 and 19) pulling it slightly upwards and to the back. Damage to the modelling of monk EN 4.7 (break in his feet, broken tip of cloak) was treated at the detached figure.
A first test showed that monk EN 4.7 had to be inserted first, and that after this the other two fragments could be arranged in the right position. The position of monk EN 4.1 could be deduced from the imprint of the upper pole inside the back of the mountain: To fit in the figure at its correct position on the upper pole, it had to be moved to the right (southwards); this was only possible if it was pushed forwards 1 to 2 cm, because otherwise its left sleeve touched a ridge of mountain S 28 and prevented any shifting. The test also showed that the deformation of the straw bundle inside the mountain is too serious to allow a perfect realignment of the broken parts: The gap between the lowest part with EN 4.7 and the part

above could not be closed. After the best positions of all parts had been found, monk EN 4.7 was taken down again.
The overhanging position of the monk required an additional fixation: At the back, he was almost unsupported by the lower pole. The peg was very long, but pointing downwards and thus could not prevent the figure from sliding down. The hole for the peg inside the figure was shallow (about 1.5 cm deep), and the clay modelling above was broken off and partly lost because of the stress caused by the tilt of the figure. An attachment only by gluing with clay material, without additional mechanical stabilisation, was rejected because the adhesion is not strong enough. After a first discussion, the idea was to attach the monk at two levels, behind his shoulders and at the level of his thighs. While the lower connection level should serve to attach the figure tightly to the mountain, the upper one should prevent it from tilting (fig. 121). According to the guidelines and wishes of the Chinese conservators from the Shaanxi Institute for Conservation and Zhao Liang, no wire should be used at the figure, and there should be only one connection point per figure. After long discussions, the compromise was found to attach this figure at two points, and to use wires at the mountain and at the back of the sculpture. Both interventions would be invisible afterwards, and they would not affect the painted surfaces. The cotter pin for attaching the wire inside the figure had to be bamboo, not steel.

The execution of this plan was rather complicated and comprised the following steps:
a. Preparation of the figure
- Step 1: - cutting a groove in the back of the sculpture at the level of the shoulders; underneath the surface the groove widens
  - inserting steel hanging wire, attached to a bamboo pin, into the groove
  - turning the bamboo pin slightly inside the groove so that it cannot be pulled out (fig. 126)
  - filling the groove with a mixture of clay and pumice (fig. 127)
- Step 2: - drilling a hole between figure and mountain at the level of the thighs
  - inserting steel hanging wire
  - connecting the steel hanging wire to a pipe clamp which later on can be closed on the back of the mountain (fig. 129)
- Step 3: - cutting the hole for the peg deeper in and enlarging it at the lower side to allow the insertion of the peg in a more inclined angle
  - re-attaching the broken-off clay coil above the peg
  - inserting a hemp string from the top of the clay coil downwards at the back of the figure to the lower hem of its robe, to prevent the clay coil from breaking off again
  - building up the modelling around the peg at the back of the figure where clay modelling is lost (fig. 129)
  - inserting a thin tube into the hole of the peg through which clay mixture can be injected (attached with animal glue)

b. Preparation of mountain S 23 and the back of the figure
- Step 4: - adjusting the position of the middle part of the broken mountain S 23
  - drilling a hole through the middle part to lay the wire from the back of EN 4.7 to the back of the mountain
- Step 5: - injecting clay mixture to stabilise the broken parts of the clay shell at the back
  - enlarging the trench for the peg in the clay modelling to insert the peg as steep as possible
  - pushing the peg backwards as far as possible
- Step 6: - affixing an iron angle to the wooden beam (3) above the peg
- Step 7: - temporary fixation of the mountain by two bamboo poles (fig. 133) and strings around the mountain at different levels to stabilise the mountain
- Step 8: - cutting the wire around the tip of S 23 behind EN 4.1
  - temporary fixation of mountain tip and figure EN 4.1 in the right position by strings around figure and mountain

As auxiliary devices for the reattachment two sets of strings were installed, one to lift and hang the figure from the scaffold and a second one to hold it in the right position during drying (fig. 130). The latter one was running from the figure around the mountains, over the top of beam (3) towards the outside, and could be fixed to a nail driven into the brick revetment (fig. 134).

c. Re-attachment of the figure

The re-attachment had to happen quickly. The figure had to be inserted without any corrections of its position. All the following steps were carried out on the scaffold. Two persons were standing on the scaffold, one outside on a ladder to work through the gap of panel (10), two more, one outside and one inside, on the floor to assist. Fig. 121 shows a schematic view of the final situation.

- Step 9: - lift of the figure hanging on the string (fig. 130)
  - insertion of the loop of the temporary fixation string around the figure (fig. 131)
  - threading the wire in the back of EN 4.7 through the hole in the mountain
- Step 10: - covering the part of the figure's back that had to be affixed and the hole for the peg with a thick layer of clay mixture (clay + hemp fibres + sand)
  - covering the fracture edge of S 23 with the same mixture (fig. 132)
- Step 11: - pulling the figure up and taking it to its right position (fig. 131)
- Step 12: - pushing the peg in as far as possible from the back
  - injection of clay mixture into the peg hole through tube
  - securing the temporary fixation string at the outside of the wall (fig. 134)
  - closing the pipe clamp around the mountain; thick blotting paper under the metal serves as protection of the modelled surface (fig. 133)
- Step 13: - insertion of a wooden wedge between peg and iron angle next to beam (3), so the end of the tip is pressed down (and the tip upwards)
  - closing the pipe clamp around the angle and the peg next to the mountain
  - filling cracks and missing parts underneath and around the pipe clamp by injecting clay mixture (clay + pumice)
  - attaching pipe clamp to wire; fixing it with turnbuckle to screw in beam (3) (fixation no. 18)
  - attaching the wire from the back of EN 4.7 to the turnbuckle and then to the screw in beam (3) (fixation no. 17)
- Step 14: - stabilising the middle part of S 23 by injection with clay mixture and fillings along the fracture edges

24 hours later:

- Step 15: - removal of the temporary fixation of the mountain by bamboo poles
- Step 16: - removal of tube from peg hole

four days later:

- Step 17: - removal of temporary fixation by strings
  - filling the remaining gaps between figure EN 4.7 and mountain
- Step 18: - completing the missing parts of the modelling on the back of the mountain
- Step 19: - insertion of a steel hanging wire around the tip of mountain S 23 (behind monk EN 4.1, fixation no. 1) and through S 23 and upper pole to support its position (fixation no. 4)
  - filling the gap between EN 4.1 and mountain to increase adhesion

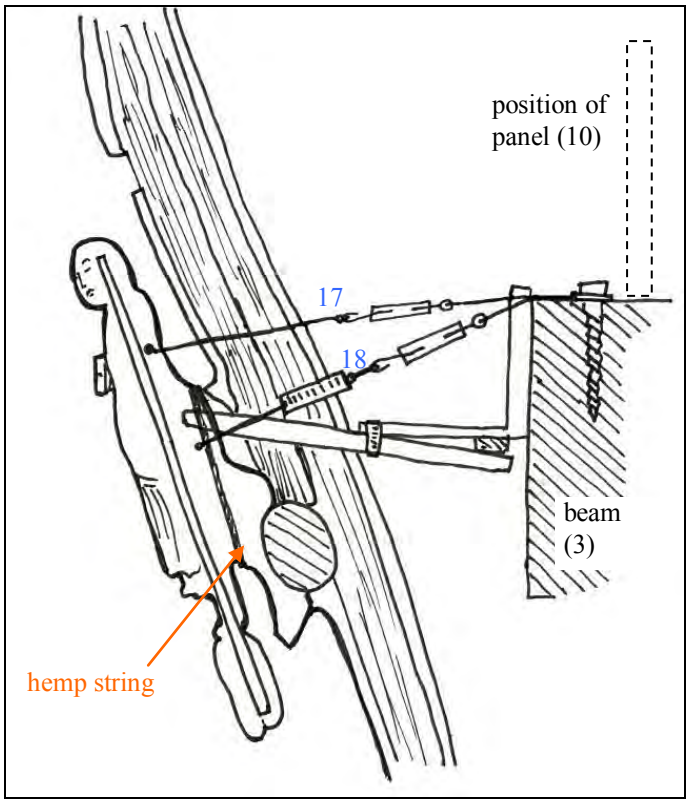


Fig. 121
Schematic view of fixation of EN 4.7 (partly section and partly lateral view): The figure is positioned in front of the lower pole. For the fixation steel wires (fixations nos. 17 and 18) were attached to a screw in beam (3). The peg is supported by a hemp string around the figure and an iron angle affixed to beam (3).

Fig. 122
Figure EN 4.1 before treatment with temporary fixation
[Gao Yan, Shaanxi Inst. for Cons.]

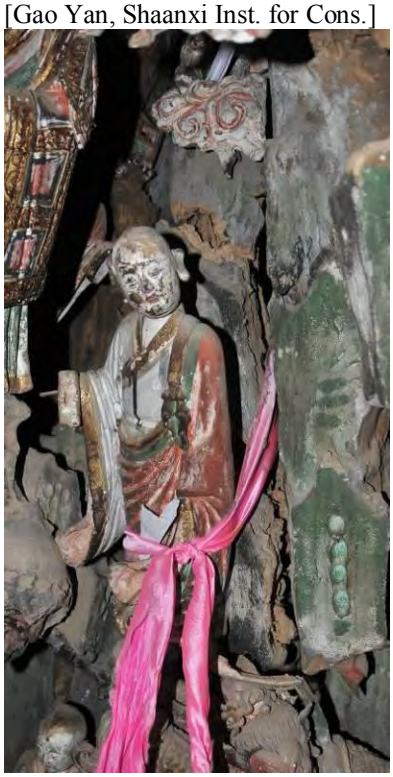


Fig. 123
Taking EN 4.7 down. The figure was loose, just wedged into the corner
[Gao Yan, Shaanxi Inst. for Cons.]

Fig. 124
Mountain S 23 after detaching of EN 4.7. The tilted middle part is visible.
[Gao Yan, Shaanxi Inst. for Cons.]

Fig. 125
Figure EN 4.7 during conserva-tion of broken parts in the courtyard. In the lateral view the mountain part connected to EN 4.7 with imprint of lower pole is visible.

Fig. 126
Bamboo pin in the back: pin turned inside groove

Fig. 127
Filling the groove in the back of the shoulders with clay mixture

Fig. 128
Preparation work in the courtyard after nightfall

Fig. 129
Next morning: Preparation before re-attaching figure EN 4.7. The modelling around the hole for the peg is enlarged and stabilised. The pipe clamp is attached to the back.

Fig. 130
EN 4.7 is lifted while hanging on ropes. A second rope is passed through the mountain scenery as temporary fixation. The wire in the back is carried through mountain S 23. In the meantime clay mixture is applied to the fracture surface of the mountain
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 131
Fitting in the figure to the right position: The figure is lifted and pulled backwards with the temporary fixation. In the right hand, S. Demeter is holding the tube inserted into the hole of the peg
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 132
Applying clay mixture to the fracture surface at the lower pole
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 133
View at the back of mountain S 23 after re-attachment of EN 4.7 and temporary fixation with bamboo poles and the white rope which was attached to the outside of the wall (see fig. 134)
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 134
Temporary fixation of EN 4.3 with a rope attached to the outside of the hall [Gao Yan, Shaanxi Inst. for Cons.]

Fig. 135
Connection of the *piaodai* of EN 4.9 to the cloud (dot), now in front of the shoe of EN 4.7 (arrow)

Fig. 136
Mountain S 23 with EN 4.7 and EN 4.1: Situation before treatment
[Zhen Gang, Shaanxi Institute for Conservation 2005]

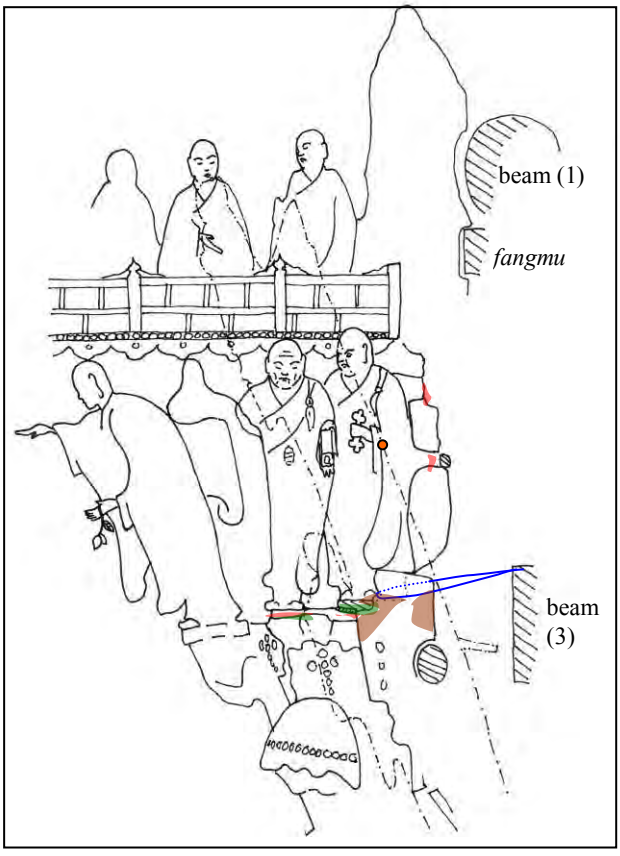
Fig. 137
Mountain S 23 with EN 4.7 (lower mink) and EN 4.1 (upper monk): Situation after treatment in Nov. 2011

After drying, the temporary fixations could be removed. The weight of figure EN 4.3 is now resting on the lower pole, but this cannot prevent it from tilting. The main tension therefore is transferred to the wire in the back of the figure.
Although figure EN 4.7 was pushed upwards as far as possible, its position is now lower than it originally was. This became obvious when the *piaodai* around the head of EN 4.9 was reshaped and realigned: The *piaodai* had originally been attached to the cloud of EN 4.7 (fig. 135: dot), but the attachment point now is in front of the shoes of EN 4.7, not in front of the cloud (fig. 135: arrow). This proves that the poles have sagged about at least 3 to 4 cm on the northern side of the wall.

Monks GN 7.19a and GN 7.19b

The loose figure GN 7.19b was taken down from the wall. His loose left hand and the broken left tip of the cloak were re-attached. Loose clay fragments between monk GN 7.19a and the mountain to his right were removed to fit in the monk as closely to the mountain as possible. In this way the figure could be brought back in an upright position. A wooden wedge was temporarily inserted underneath his left foot to prevent him from tilting (fig. 141).

Monk GN 7.19b was re-inserted, using a rope as temporary fixation (fig. 142). Both figures were carefully moved in order to optimise their position: The position of GN 7.19b was adjusted according to the fracture edges in his back, close to the terrace. When the monk was fitted in correspondingly, a square space, shaped rather strangely, remained behind his back. It certainly preserves the shape of a lost element (fig. 143). Next to it, there is a wooden peg (figs. 139 and 134). The crack between GN 7.19a and the mountain next to him as well as the gap below his feet were filled (injection of clay with pumice). As it was too dangerous to take monk GN 7.19b out again, the original wooden peg could not be reinserted into his back. A threaded bar (diameter 10 m) was used instead, which is thinner and shorter (fig. 143). A wooden block below his left foot and the broken rock ledge served as support. A bamboo stick was horizontally inserted between his left shoulder and mountain S 23 (fig. 143 and 144). This solution does not look elegant, but it is simple and reversible and not visible from below. The broken top of S 29, where reed was sticking out (fig. 141), was covered with a clay-straw mixture. Working from outside, the gap between figure and mountain was filled to achieve a stable support. As the clay covers the side of the monk's shoe and robe (as it also did originally), a layer of Japanese paper was used as isolation layer. The large gap (10 cm wide) between mountain S 29 and the lower pole was filled (clay + straw). A hanging wire (fixation no. 16) was carried around S 29 and to beam (3), thus pulling S 29 backwards to the lower pole as far as possible (fig. 143).



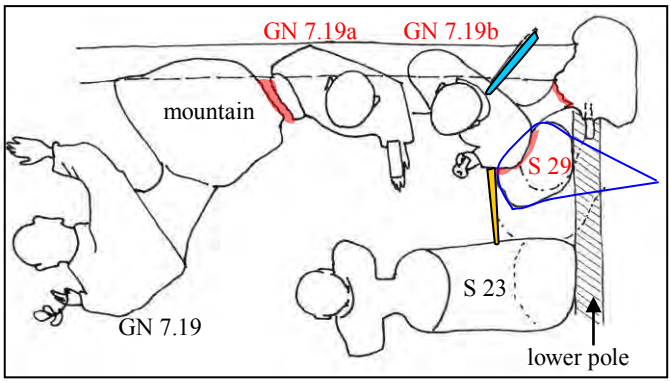


Fig. 138 a and b
Schematic view of conservation treatments on GN 7.19a, GN 7.19b and S 29

realigned
filling
hanging wire
bamboo stick
threaded bar
support

Fig. 139
Situation after removal of GN 7.19b. Below the damaged mountain S 29 the lower pole is visible. In the upper part of the picture the peg from the lost element can be seen.

Fig. 140
Adjusting the position of GN 7.19a towards the mountain.

Fig. 141
Wooden wedge as temporary stabilisation of the upright position of GN 7.19a. In the front: reed sticking out of the damaged top of mountain S 29.

Fig. 142
GN 7.19b reinserted and position adjusted. Top of S 23 filled. Temporary fixation of GN 7.19b by a rope and a horizontally inserted bamboo stick.

Fig. 143
GN 7.19a and GN 7.19b after treatment seen from outside: Clear space behind the back of the figure and wooden peg in the mountain next to it; in the lower part steel wire around mountain S 29

Fig. 144
GN 7.19a and GN 7.19b after treatment from inside [Gao Yan, Shaanxi Institute for Conservation]

Fig. 145
Mountain S 26, after removal from behind *shijiamouni* EN 4.3 (darkened areas from consolidation of broken parts); 10 to 12 cm are broken off from the peak on the left side.

Fig. 146
S 26 after consolidation and cleaning of the surface, including reduction of marks of clay suspension from 1981-85 [Shaanxi Institute for Conservation]

Feitian EN 4.5 and EN 4.6

Both *feitian* were loose, and their mounting from 1981-85 was aesthetically unsatisfactory. Therefore, it was decided to re-mount them in a better fitting and visually improved way. The wire from 1981-85 around the torso of the figures was cut. After that, the figures could easily be taken down as they were not connected with the clay lumps from 1981-85 lying behind them (figs. 170 and 171). Before removing the clay lumps, a cloth was spanned below to collect falling dust and dirt (fig. 151). The removal of the clay lumps exposed the laths and wires used for the fixation in 1981-85, and the broken mountains S 9 and S 18 in which the laths had been driven (fig. 152). In a first step, the mountains and figures were conserved. Then, *feitian* EN 4.6 was re-attached. *Feitian* EN 4.5, however, could not be put up at the wall so far.

Feitian EN 4.5 and mountain S 26

After the *feitian* had been taken down, the clay lump and the wires from 1981-85 were removed. The lath was removed from mountain S 18. The vertical crack in mountain was filled by injecting clay suspension and fixed by a rope during drying. Losses next to the crack were filled with a clay-straw mixture.

The *feitian* was treated lying on a panel. It was rather time-consuming to align the broken arms, hands, necks, feather tips and *piaodai*, but in this way the original shape of the figures could partly be regained. The feather tips could be straightened using pliers, the preserved wires of the *piaodai* could be reshaped. A feather (F 135) found behind *pusa* EN 4.21 could be inserted into one of the wings (fig. 154).

After removing the elements used for the background of *shijiamouni* EN 4.3 in 1981-85, it was discovered that one of them, mountain S 26, belongs, upside down, between mountains S 18 /S 19 and *feitian* EN 4.5 (figs. 145 and 146). One of the hanging "peaks" of S 26 had broken off: The fracture edges at S 18 show that at least 10 to 12 cm are missing (figs. 148 and 150). The remodelled upper part of mountain S 19 (remodelling from 1981-85) had to be reduced to a level close to the upper pole in order to insert mountain S 26 in a fitting position (found by aligning the fracture edges of the original parts). S 26 was attached to the upper pole and the mountains S 18 and S 19 behind it with clay mixture (clay + hemp fibres + sand). Bamboo chopsticks were inserted into the two square holes intended for mounting the *feitian* in order to ensure that the holes were not blocked and could be used afterwards.

The original position of the *feitian* in front of the mountain cannot be reconstructed from the preserved traces. The clay material that had been attached to the back of the skirt is broken off. At mountain S 20, there is an area without paint layer which indicates that the cloud behind the skirt of the *feitian* originally protruded at the lower end of the skirt (now it is broken off behind the skirt). Areas of mountains S 26 and S 20 without paint layer (i.e. areas which, at the time when the wall was created, could not be reached by a paint brush after the *feitian* had been mounted) only give a vague idea of the position of the figure. According to the holes in mountain S 26 and the areas without paint layer, the original position of the *feitian* was higher than the place assigned to it in 1981-85 (fig. 150). The clearance between *feitian* and mountain cannot be reconstructed for the same reasons. After the repair in 1981-85, the distance between the upper pole and the *feitian* measured 13 cm. At least in the case of *feitian* EN 4.6 (*see: below*), the original clearance was probably smaller.

As the mountain S 26 was reattached only on November 4, and the drying time was estimated to be at least three weeks, the *feitian* could not be mounted (the work stay ended on November 19). The system of mounting has still to be discussed, i.e. if the original holes, which are small and square, or the bigger hole from 1981-85 shall be used and if the mounting device shall be made of metal or wood. Temporarily, the *feitian* was stored in a cardboard box in the south annex building.

Fig. 147
Mounting of *feitian* EN 4.5 in 1981-85

Fig. 149
After detachment of *feitian* EN 4.5

Fig. 148
After remounting S 26 (dotted line indicates the lost "peak")

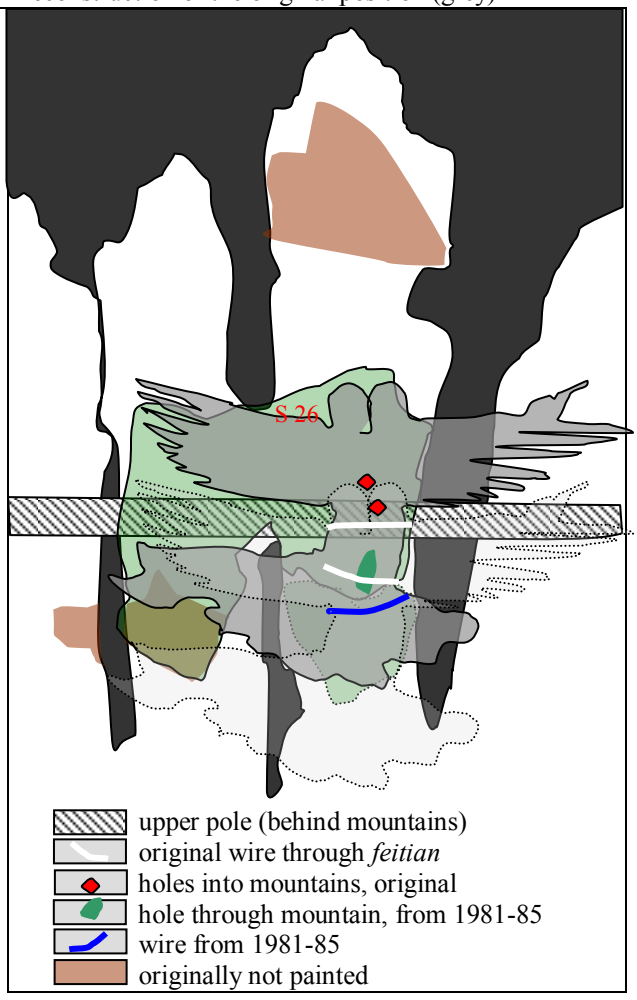


Fig. 150
Position of *feitian* after 1981-85 (dotted) and tentative reconstruction of the original position (grey)

Fig. 151

Fig. 152

Fig. 151
Removal of *feitian* EN 4.5. The cloth serves to catch loose clay and dirt [Gao Yan, Shaanxi Institute for Conservation]

Fig. 152
After removal of *feitian*: wires from 1981-85

Fig. 153
After removal of wires and lath

Fig. 154
Inserting feather F 135, found behind *pusa* EN 4.22, to the wing of the *feitian* [Gao Yan, Shaanxi Institute for Conservation]

Fig. 155
Realigning broken limbs [Gao Yan, Inst. for Conserv.]

▲ Fig. 153

▼ Fig. 154

▼ Fig. 155

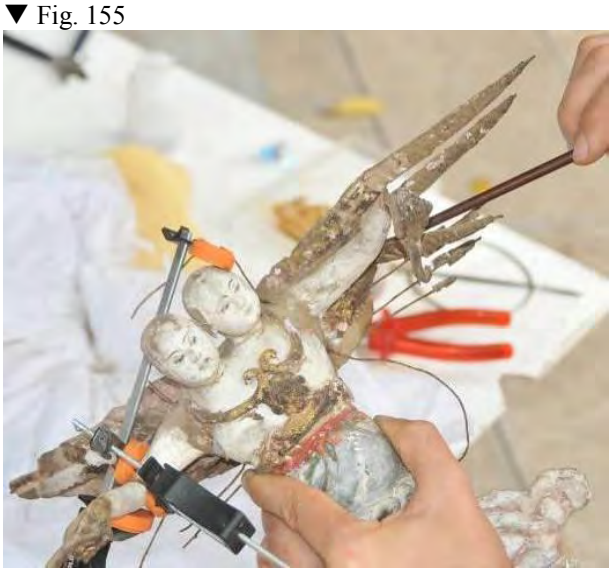


Fig. 156
Feitian EN 4.5, after removal from the wall
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 157
Feitian EN 4.5 after conservation in 2011, before storing it. The *piaodai* ring around the head is broken again.
[Gao Yan, Shaanxi Institute for Conservation]

In August 2012, the hands, and hands were broken again and had to be re-attached. A detached fragment was identified as bent feather. It was straightened and re-attached. The *piaodai* around the head was stabilised and closed by winding a steel wire around the broken iron wire.
After examination of the smaller figures attached to the aureoles of the large Buddha figures in front of the middle wall, it was decided to reconstruct the original mounting of the *feitian* using an iron pin. An iron pin with a cross section of 8 x 8 mm and one pointed end was made by a local blacksmith, and shortened to the required length on-site (fig. 160).
Precautions were taken to prevent the *feitian* from slipping off the tip of the pin: Two holes were drilled through the pin near the blunt end. Through the hole closest to the end, a piece of wire was threaded and bent slightly, serving as detent inside the hole in the back of the *feitian* (fig. 158 and 159: 1). Through the other hole a steel wire ring was threaded to support the *feitian* behind the back (fig. 158 and 159: 2). At the pointed end of the pin, the edges were sawed in, in order to create barbs preventing the pin to slide out of the mountain (fig. 158 and 159: 3). Additionally, a loop of hanging wire which was put around the torso at the position where originally the upper iron wire had been, serves as direct connection of the *feitian* to the wall (fig. 158 and 159: 4). The loop was wrapped with a strip of thin Japanese paper to avoid abrasion of the paint layer by the wire. The paper wrapping also has the advantage to be more unobtrusive than the shiny hanging wire. Pin, detent and wires were coated with Paraloid B 48 N to prevent corrosion.

After the pins and all wires had been prepared the *feitian* was mounted to the wall:

1. The iron pin was inserted into the mountain. The hole was pre-moistened with diluted clay suspension. The iron pin could be pierced about 12 to 13 cm deep into the existing hole (upper hole) in the mountain.
2. A piece of stiff wire was used as a needle to pierce through the mountain from the hole for the iron pin and to thread the wire for the loop around the torso (fig. 158 and 159: 4) from the front to the back of the mountains (fig. 161) where it was attached to the wooden construction (fig. 164 and 158: 5).
3. The *feitian* was placed on the blunt end of the iron pin. The wire loop around the torso was put into the right position. The turnbuckle which attaches it to the wooden post construction was connected to a wire attached to a hook in the rectangular *fangmu*. To achieve the optimal level of height the wire had to be passed around the *fangmu* from below (fig. 164).

The wire for the ring to be placed around the preserved clay protrusion at the back of the *feitian* was threaded through the iron pin (fig. 162).

4. A temporary fixation holding the *feitian* in the correct position was achieved using a string attached to the rafters with a screw clamp (fig. 163).
5. The wire loop was attached to the turnbuckle with slight tension. The wire ring around the clay protrusion at the back of the *feitian* was closed.

The wires and the temporary support were sufficient to hold the *feitian* in the right position.

6. The hole in the back of the *feitian* was filled with a mixture of clay with hemp fibres and glass foam (Poraver®, 0.1-0.3 mm), in the ratio of 3:1 (volume parts). Poraver® was chosen because clay mixtures with this material get harder than the ones with micro-balloons and the angular particles support a mechanical locking. The disadvantage is that the porous material had taken up more water than micro-balloons: Shrinkage cracks appeared after 24 hours. The gaps were closed with a mixture containing a higher ratio of Poraver®. New cracks did not appear.
7. When the clay in the hole on the back of the *feitian* was almost dry, the "protrusion" around the iron pin was remodelled, partly imbedding the wire ring at the back.

After drying the temporary fixation could be removed.
The hole in mountain S 26 caused by the lath used for mounting the *feitian* in 1981-85 was closed with a clay-straw mixture (fig. 168).

Some consideration was given to the fact that by this way of mounting *feitian* EN 4.5 is positioned on a higher level than *feitian* EN 4.6 is. There is also a rather large unpainted area in mountains S 26 and S 30 below *feitian* EN 4.5 which is not concealed now (fig. 168). The level of the hole in mountain S 26 however does not allow to mount the *feitian* in a lower position (fig. 167). The unpainted area is larger than the skirt of the *feitian* and the attached cloud, what means that the *feitian* in the present state of mounting cannot cover the unpainted background. One possibility is that originally there was a cloud which fell down or another element attached only with clay as there are no holes for pins or pegs. The assumption that the missing element may have been a cloud is supported by the fact that the mountain behind the *feitian* is painted: this mountain was almost concealed, but it had no direct contact to the *feitian*. Clouds, however, were "glued" to the wall without additional reinforcement and were so close to the wall that the mountains behind remained unpainted. Another cloud is obviously missing at the tip of mountain S 28, behind the head of the *feitian*. Thus the original situation may have presented the *feitian* "floating" in front of clouds and "admired" by the man EN 4.8 standing below at a kind of altar table.

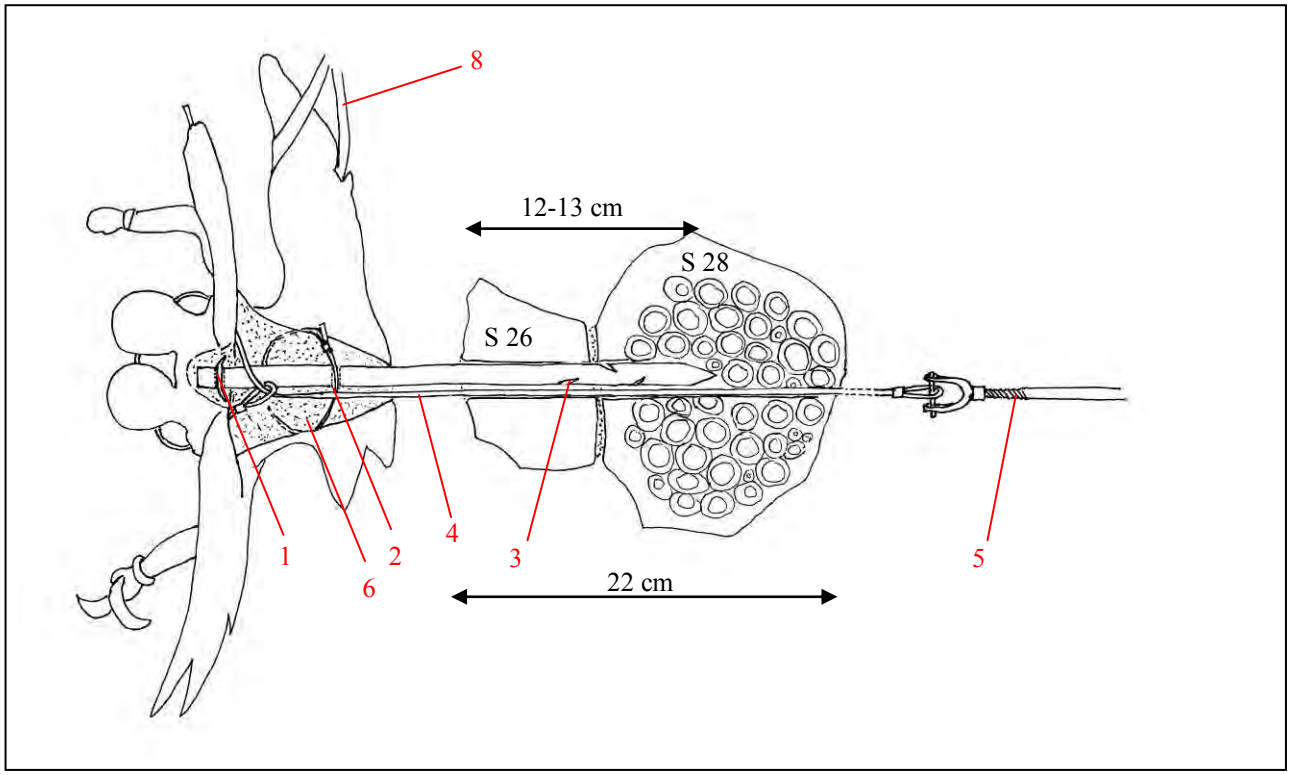


Fig. 158
Schematic drawing of *feitian* EN 4.5, after mounting, view from top

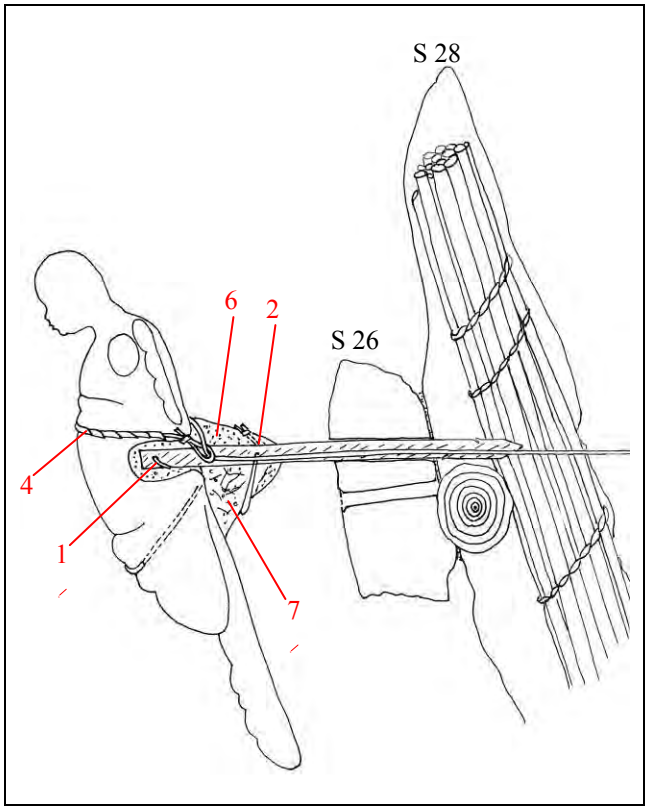


Fig. 159
Schematic drawing of *feitian* EN 4.5, after mounting, section through vertical axis

Explanation for fig. 158and 159:

1 Wire detent inside the hole in the back of the *feitian*
2 Wire ring to support the back of the *feitian*
3 Barbs cut into the edges of the tip of the iron pin
4 Wire loop around torso, wrapped in Japanese paper
5 Turnbuckle attaching wire loop to the wooden construction of the wall (*fangmu*)
6 Clay-hemp fibre mixture applied around pin
7 preserved part of original clay protrusion below the pin
8 Temporary support of *feitian*, attached to the rafters (red string)

Fig. 160
New iron pin for *feitian* EN 4.5 in comparison to an original pin; two holes drilled near the blunt end
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 161
Feitian EN 4.5: Threading the steel hanging wire designed to be placed around the torso through the mountain [Gao Yan, Shaanxi Institute for Conservation]

Fig. 162
Feitian EN 4.5: Attaching wire ring around the protrusion at the back of the *feitian*
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 163
Temporary support of *feitian* EN 4.5 during mounting: red string attached to the rafters with screw clamp
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 164
Hanging wire loop around torso attached to the *fangmu* of the wooden construction with a turnbuckle (top view)
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 165
Feitian EN 4.5 after installation of wire fixation
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 166
Feitian EN 4.5 after filling the hole in the back and remodelling the protrusion around the pin
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 167
Feitian EN 4.5 after mounting to the wall, front view (slightly from below)

Fig. 168
After mounting *feitian* EN 4.5 to the wall: filling in the damaged mountain S 28 and unpainted area from a missing element (cloud?) below the *feitian*

Feitian EN 4.6

The treatment of the detached *feitian* comprised aligning and reconnecting the broken parts (neck, arm) and reshaping the wire reinforcements of the *piaodai* and the feathers. The ends of the broken *piaodai* were reconnected by fibrils of hanging wire. The preserved wires of the feathers could be straightened using pliers (fig. 154); thus the impression of wings could be regained (figs. 174 and 175).

Before the *feitian* could be re-attached, its position had to be determined. Differently from *feitian* EN 4.5, the mountain showed no holes from the original mounting (fig. 173). The only clues to its original position are the unpainted areas of mountain S 10 (probably corresponding to the outline of the lost right wing) and on S 8 (a small area that may have been hidden by a - lost - cloud at the lower hem of the skirt (fig. 178). A fracture area with traces of pink on S 9 seems to indicate a lost connection between the mountain and a cloud. Based on these clues, the new position of the *feitian* was chosen. It is attached at the same level as in 1981-85, but closer to the mountains and tilting more to its right side (anti-clockwise).

For the new fixation, the lath from 1981-85 was shortened. The tip was adjusted in shape and smoothened to be inserted into the *feitian*. The broken mountain S 9 was stabilised by injection of clay suspension and clamped together with a temporary fixation (fig. 179). Losses around the crack were filled with a clay-straw mixture. The lath was attached to the upper pole by a segment of steel pipe clamp and two screws (fig. 180) to ensure the stabilisation in the right angle, preventing the lath from sliding forward or tilting. A steel hanging wire was threaded through the hole next to the lath. It serves as an additional fixation of the *feitian* to the lath, replacing the wires that had been used originally. To prevent the steel wire from touching the painted surface, the wire was wrapped up in Japanese paper (fig. 181, 182). A clay mixture (clay + hemp fibres + sand) was filled into the hole in the back of the *feitian* (fig. 183). The *feitian* was inserted into the wire loop and put onto the lath. Behind the mountains, the hanging wire was fastened to the lath by a pipe clamp (fig. 186). The *feitian* was supported by a temporary fixation of strings (fig. 187). At the fracture edge of mountain S 8, where traces of pink were visible, a support filling was built up between the mountain and the *feitian*. After drying, the temporary fixations could be removed (fig. 188). The gap between the *feitian* and the mountain caused by a missing rock element, was not closed. The metal elements (pipe clamp and screws) were coated with clay suspension.

▲ Fig. 169

▲ Fig. 170

Fig. 169
Feitian EN 4.6 before treatment

Fig. 170, 171
Fixation by lath and clay lump from 1981-85

Fig. 172
Removing *feitian* EN 4.6 [Gao Yan, Inst. for Conserv.]

Fig. 173
After removal of *feitian* EN 4.6

▲ Fig. 171

▼ Fig. 173

▼ Fig. 172

Fig. 174
Feitian EN 4.6 after removal [Inst. for Conserv.]

Fig. 175
Feitian EN 4.6 after conservation [Inst. for Conserv.]

Fig. 176
Conservation of *feitian* EN 4.6 [Shaanxi Institute for Conservation]

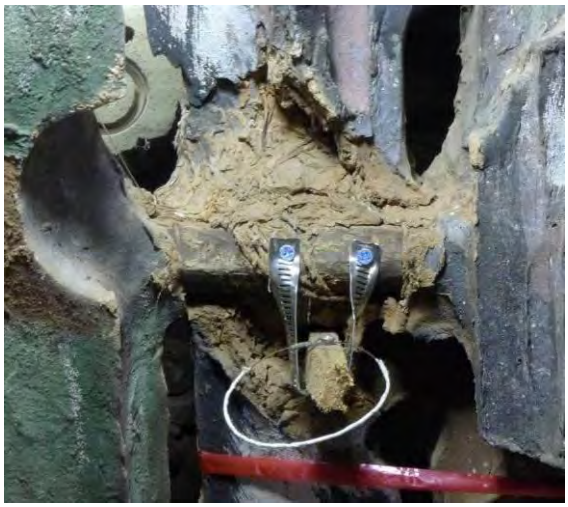
Fig. 177
Straightening the kinked and bent wired of the lost *piaodai* using pliers [Gao Yan, Shaanxi Institute for Conservation]

Fig. 178
Adjusting the position of the *feitian* according to traces on the mountain [Gao Yan, Institute for Conservation]

Fig. 179
After reinserting the lath and stabilising the mountain [Gao Yan, Shaanxi Institute for Conservation]

▲ Fig. 180

▲ Fig. 181



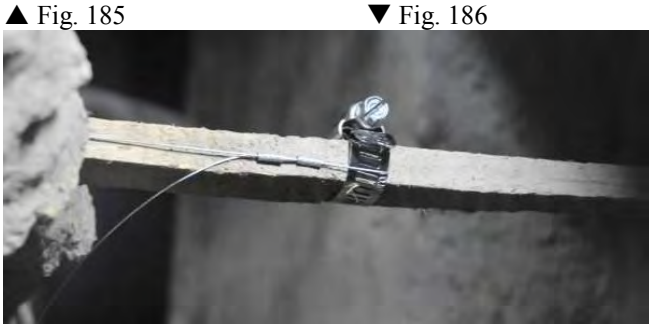
▲ Fig. 182

Fig. 183

▼ Fig. 184

▲ Fig. 185

▼ Fig. 186



▲ Fig. 187

▲ Fig. 188

◀ Figs. 155-161

Fig. 180
Inserting lath and fixing it by pipe clamp
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 181
Wrapping up hanging wire in Japanese paper

Fig. 182
Attaching loop of wire wrapped up in Japanese paper to lath

Fig. 183
Preparing *feitian* for re-attachment: applying clay mixture [Gao Yan, Shaanxi Institute for Conservation]

Fig. 184
Attaching *feitian* by two persons [Gao Yan, Shaanxi Institute for Conservation]

Fig. 185
Re-attached *feitian* seen from above [Gao Yan, Shaanxi Institute for Conservation]

Fig. 186
Fixation of hanging wire to lath behind the mountain [Gao Yan, Shaanxi Institute for Conservation]

▶ Figs. 162 - 165

Fig. 187
Feitian after reattachment

Fig. 188
After inserting support filling (arrow)

Fig. 189
Feitian after treatment

Fig. 190
Detail of wrapped wire around belly (arrow)

▲ Fig. 189

▼ Fig. 190

a Situation before treatment

b Removal of cloud Y 9 b (F 177)

c Removal of completion from 1981-85

d mountain S 26 after removal of clouds

e after removal of S 26

Fig. 191
Sequence of dismantling the background of *shijiamouni* in five steps

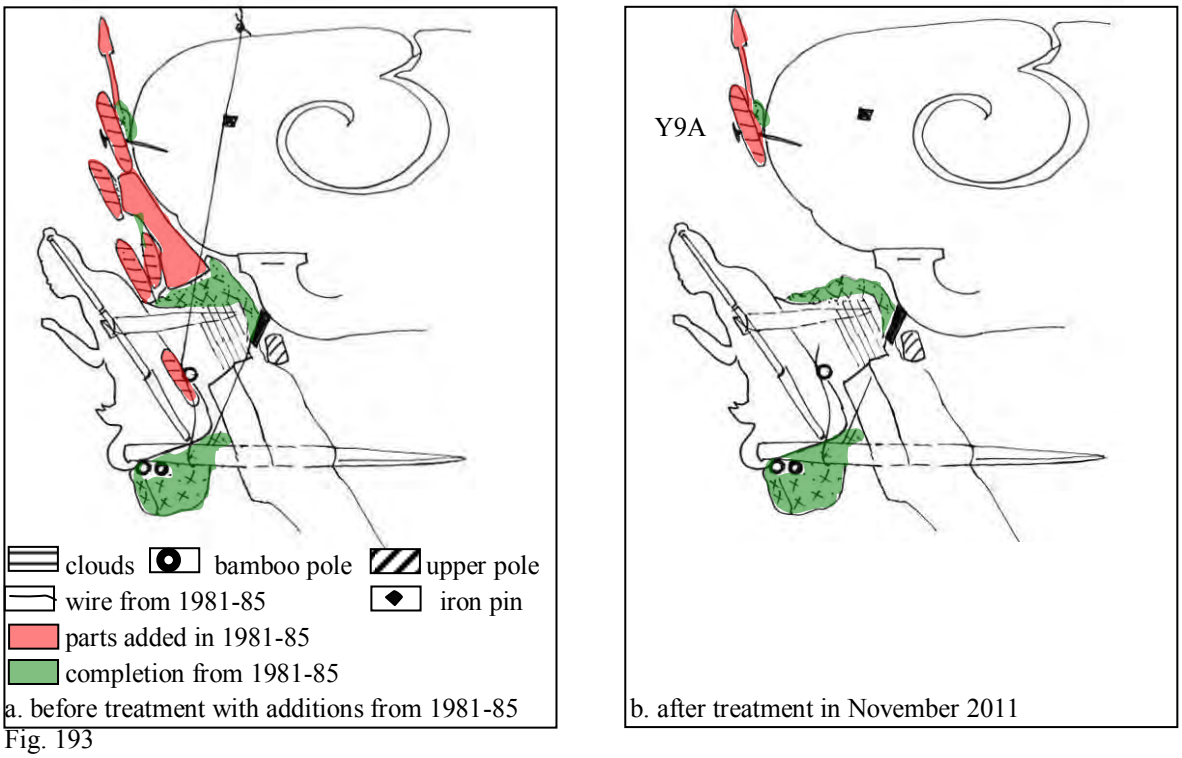
▼ Fig. 192
Overview of clouds and mountain parts detached behind *shijiamouni* EN 4.3

Dismantling the background of* shijiamouni *EN 4.3

In 1981-85 the background of *shijiamouni* EN 4.3 was composed of original elements of the wall reliefs (clouds, mountains and a tree) put together with thick applications of clay-straw mixture. In 2011, most of the original parts were detached, with the result that most of the background created in 1981-85 was dismantled. This was partly done to stabilise the background and partly to regain the original elements which had been used for the compilation.

Four parts of clouds and two parts of mountains were removed. A tip of a cloud completion made in 1981-85 was detached to reach the wire underneath and re-attached afterwards. Two original elements, a cloud nailed to the corbel bracket (Y 9A) and the fragment of a tree topping it, were left in place. To persons standing on a scaffold, the corbel bracket and the fixation wires are visible now, but for a visitor standing on the floor the difference is almost invisible. One mountain part, S 26, was identified as the rock element belonging, upside down, behind *feitian* EN 4.5 (*see above*). Two of the detached cloud fragments are parts of one and the same big cloud (F 175 a and b, fig. 194). This proves that a number of elements were definitely not at their original places.

Figure 193 shows a schematic view of the detachment. Figures 191 and 195 to198 demonstrate the sequence of dismantling. In figure 192 all detached parts are shown. Figures 199 and 200 depict the situation before and after detachment.



a. before treatment with additions from 1981-85

b. after treatment in November 2011

Fig. 193
Section through *shijiamouni* EN 4.3 (schematic view) before and after removing original fragments included in 1981-85

Fig. 194
Two parts of a cloud, F 175a and 175 b, as they were found behind *shijiamouni,* and after realignment

spacer cloud + cloud head

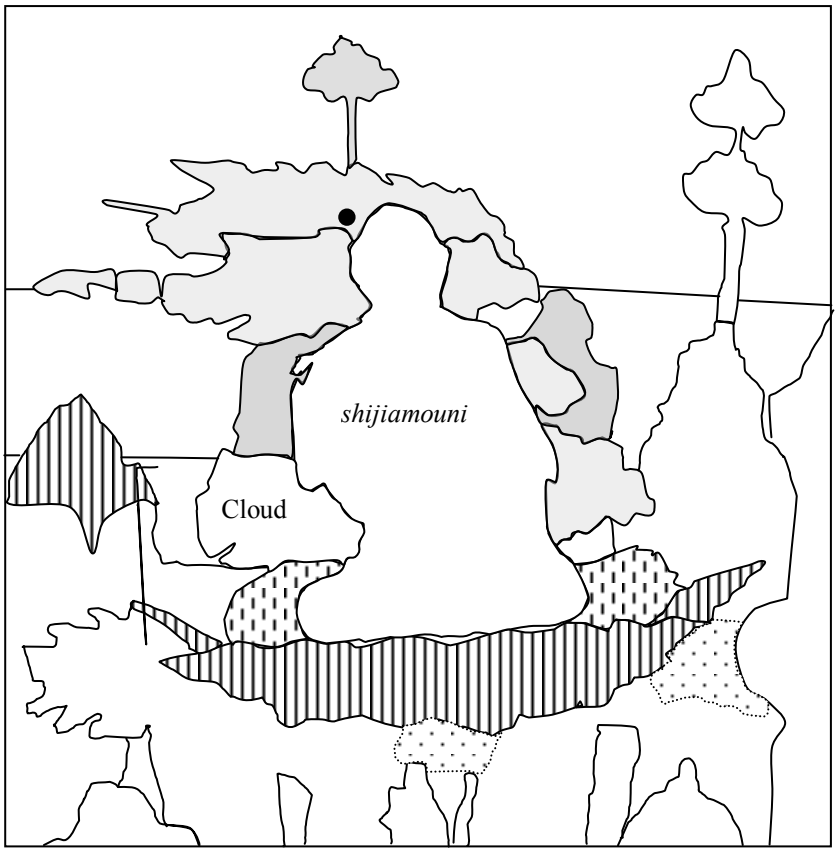


Fig. 195
View of *shijiamouni* before treatment in October 2011

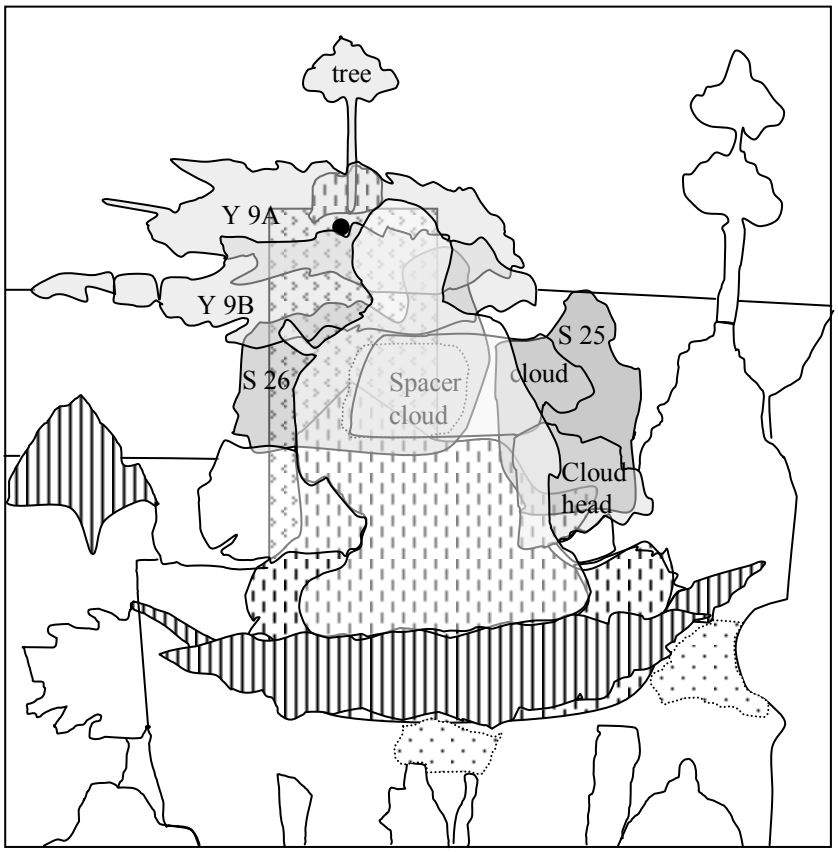


Fig. 196
Shijiamouni EN 4.3 with background created in 1981-85. View of staggered parts

Original part in original position

Original cloud included in 1981-85

Original mountain included in 1981-85

replacement cloud from 1981-85

Clay filling from 1981-85

Corbel bracket

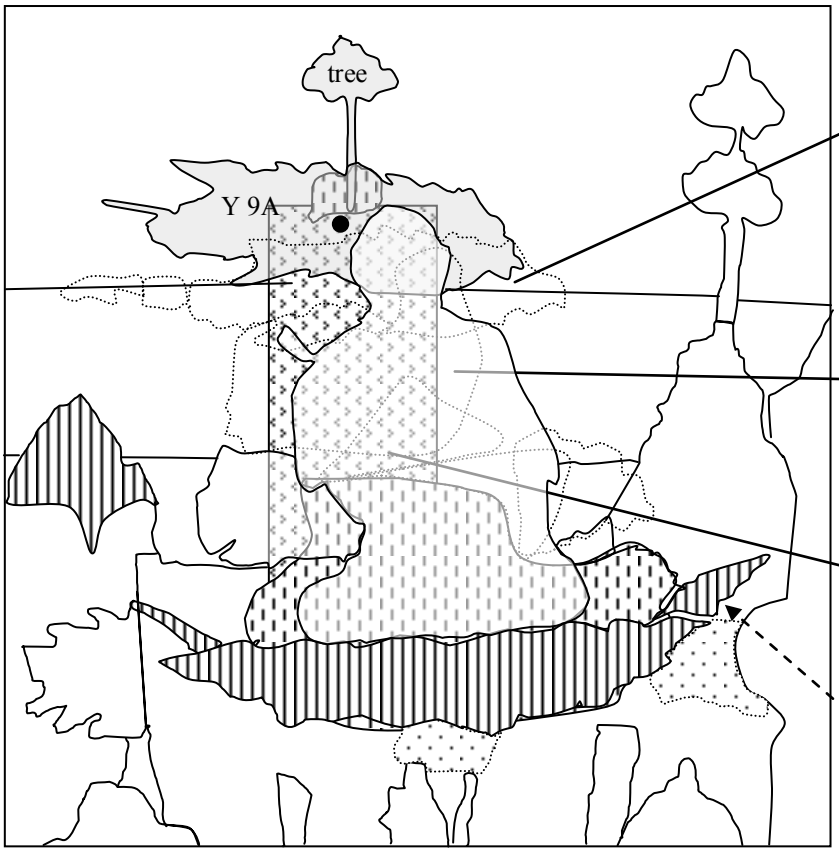
nail from 1981-85

Element missing

"spacer" cloud

cloud tail from 1981-85 (temporarily removed)

Fig. 197
Shijiamouni, removal of loose parts



To:
feitian EN 4.5

Clay ledge from 1981-85 + cloud head

Cloud tail from 1981-85 reattached

Fig. 198
Shijiamouni, detachment of firmly embedded parts

Fig. 199
Shijiamouni EN 4.3 with background created in 1981-85 [Shaanxi Institute for Conservation 2005]

Fig. 200
Shijiamouni, situation after treatment, November 2011

Fig. 201
Shijiamouni EN 4.3: tentative reconstruction based on the design of *kongzi* EN 4.2 and *laozi* EN 4.4

preserved parts

reconstructed parts

Fig. 202
Shijiamouni EN 4.3: tentative virtual reconstruction of the background using photographs of preserved parts

The original position of the four clouds and the mountain tip could not be determined yet. They may have been part of the original background of *shijiamouni* EN 4.3, but it is not clear (yet) how they did, and the traces on their back do not give sufficient evidence of the place they came from.
The observation revealed that the background of the *shijiamouni* was probably designed similar to the ones of *kongzi* EN 4.2 and *laozi* EN 4.4, consisting of mountains and clouds: There is one cloud preserved behind the right elbow of the *shijiamouni*, and bamboo poles protruding below his knees probably supported clouds as well. Behind his left shoulder, the imprint of a reed bundle indicates that once there had been a mountain peak. In the details, however, the design must have been different: While *kongzi* and *laozi* are attached to a mountain behind each of them, from their back up to the head, and the clouds are "sandwiched" between mountain and figure, the back of the *shijiamouni* is entirely modelled, and the slope of the background behind his back is still preserved. If clouds were once attached behind his shoulders, any traces of their position or fixation are missing today.
One cloud, F 176, found behind the *shijiamouni*, looks as if it could have been used for this purpose: It is cut off on one side, and a part of it is not painted. A second cloud with the same characteristics was found behind *pusa* EN 4.21 (cloud F 97, fig. 203). However, both clouds could not clearly be aligned to the shoulders of the *shijiamouni*, and they may as well come from another area. Cloud Y 9A, which is nailed to the corbel bracket, may still be at its original place, but upside down, since the now upper edge is not painted in the middle .

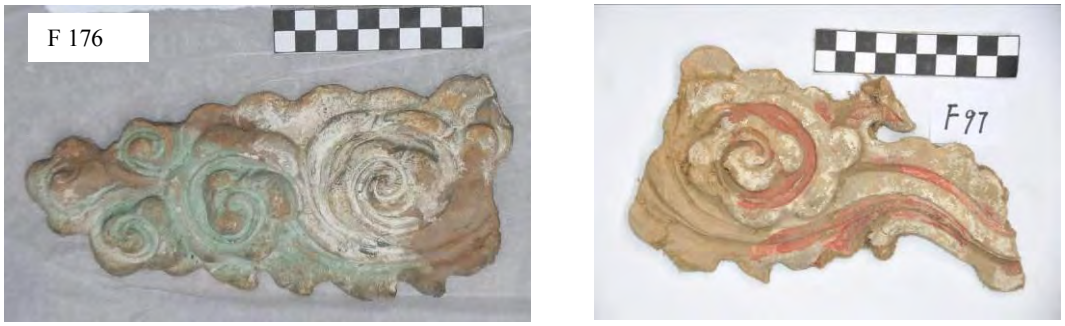


Fig. 203
Clouds F 176 and F 97 may have been placed behind the shoulders of the *shijiamouni*, but cannot be aligned

Figures 201 and 202 show a tentative reconstruction of the background and surroundings of the *shijiamouni* based on preserved parts and a comparison to *laozi* and *kongzi*. The illustrations may give an impression of the original decoration, but the details are not certain: there are no clues to how many levels of clouds there were behind the *shijiamouni* or in which direction the "head" and the "tails" of the clouds were pointing.

Conservation of broken and loose parts

Many unsupported and protruding elements were broken, like arms, hands, swinging sleeve tips or cloud tails or the arms of the canopy. Separated parts were aligned and re-attached starting at the top of the wall and continuing downwards. The conservation included the fingers of the *baoshen fo*, the *piaodai* of the *tianwang* on the southern (right) side, and some broken limbs and parts of the crown of the *pusa* EN 4.21 and EN 4.22. The treatments of the *tianwang* on the northern (left) side were mainly carried out in 2012.
The positions of the broken elements are listed in detail in: *Tabular overview of treatments,* p. 156-172).

Many broken parts had to be stabilised temporarily before they could be conserved to prevent further damage and losses. Strings, pins and spacers were used to hold the fragile elements in place (fig. 206). As a first step, broken parts were aligned or assembled 'dryly', i.e. without using clay suspension. In few cases, clay fillings and completions from 1981-85 had to be reduced to allow a fitting alignment of the parts. Metal and bamboo spatulas were used for this purpose. Thin layers of clay suspension on painted surfaces were reduced by moistened soft *blitzfix* sponges.[18] Clay suspension was used for thin cracks and breaks. The suspension was diluted depending on the needs and applied by paint brushes or injected. For cracks with large spaces, holes or gaps, clay mixtures with fillers were used. For injection mixtures pumice was added. If the clay could be applied with spatulas, hemp fibres + sand were also used. A surplus of clay material was taken off by means of tissue paper or moist *blitzfix* sponges. After the clay material had been applied, the treated element had to be stabilised by temporary fixations during a drying period of at least 24 hours. Pins, strings and spacers were used for this purpose (figs. 204 and 245). Fillings were only made if they were necessary for the stability of the element.

Fig. 204
Right arm of EN 4.20, realigning the break at the elbow before reconnecting [Gao Yan, Shaanxi Inst. for Cons.]

Fig. 205
Re-attachment of broken-off decorations (F 26) on the crown of *pusa* EN 4.21

[18] The sponges are made of polyvinyl alcohol and can absorb high quantities of water when moistened. In Germany, "Blitz-fix" sponges are meanwhile replaced by sponges called "Saugwunder". PVAl micropore sponges can be bought as equipment for care maintenance as device for cleaning sensitive surfaces.

Trees had broken off directly above the roots. The broken trunks were stabilised with a bamboo stick inserted into or behind the trunk and a thicker application of clay plaster supporting the break from behind. The trunk of the preserved tree on mountain S 10 was stabilised in this way. The tree found in the mountain scenery was re-attached on the tip of mountain S 4, and tree F 96 (recovered from the debris behind *pusa* EN 4.21) at the feet of corpse EN 4.23.

Conservation of parts with wire reinforcement (*piaodai*, beaded chain pendants, strands of hair)

Elements with wire reinforcement provided special problems: Firstly, the elements are mostly thin and long and prone to mechanical damage. Secondly, the wire inside can be bent and kinked, resulting in the deformation of the whole part and/or the break of the clay modelling along the wire. For these reasons, elements with wire reinforcement are much more seriously damaged than others and show more losses. The third problem is the corrosion of exposed iron wires. It leads to decreased flexibility – heavily corroded wires tend to break when you try to reshape them, and often they are already broken. The increase of the bulk caused by corrosion generates cracks in the clay modelling, resulting in even more fragility.
Elements with wire reinforcement had to be reshaped before the clay modelling could be consolidated. At elements with thicker wires, like arms, sleeve tips or clouds, the wire could not be reshaped perfectly without damaging the clay modelling. These wires possess a resistance that foils any attempt at a fitting alignment of the fracture edges without exerting tension. Here, the gaps had to be filled without perfect alignment.

Piaodai

Most of the damaged elements were *piaodai*. Cracked along the wire and across, they were often broken into many fragments which tended to come down as soon as they were touched. Numerous fragments had to be recollected and stored until they can be reinserted one by one. Dozens of detached fragments of *piaodai* were found behind the figures and at the foot of the wall.[19]
As a first step, temporary fixations were made to prevent further losses. If possible, bent and kinked parts were reshaped so far that the preserved fragments of the modelling could be re-aligned. Loose clay fragments tended to get completely detached during this procedure. The fragments of clay modelling were attached to each other and to the wire by clay suspension. Missing parts, especially of the *piaodai*, had to be completed to stabilise the whole element. The joint to the figure often had to be reinforced, either by thicker applications of clay (clay + hemp fibres + sand) from the back or by wire 'bridges' inserted between wire hooks or loops preserved on the figures and the broken *piaodai* (figs. 209 and 211). The broken *piaodai* around the head of *kongzi* EN 4.2 was stabilised from behind by a piece of brass embedded in clay (clay + hemp fibres + sand). In principle, wire is a well-suited material to repair the original wire reinforcement. In 2011, brass wires were used, as it was not possible to procure flexible stainless steel wire in time before leaving Munich for China. The material proved to be rather unsuitable, however: Even the thinnest wire (0.6 mm) was too inflexible, and the direct contact of two different metals increases the velocity of corrosion. Therefore the brass wires stabilisations were replaced by a

[19] The numerous fragments, more than two hundred, were not counted. Most of them were found around and behind *pusa* EN 4.21 and thus are probably coming from the northern part of the EN wall or the adjacent part of the GN wall.

Fig. 206
EN 4.14: Broken *piaodai* around head during re-alignment and re-attachment of loose parts [Inst. for Conservation]

Fig. 207
EN 4.9: broken *piaodai* around head with temporary fixation. Figure EN 4.7 (with orange pin on the sleeve tip) is already reinserted

Fig. 208
EN 4.9: *piaodai* around head after conservation. The lost part in the middle of the ring was completed to secure the stability of the *piaodai*

Fig. 209
EN 4.11, *piaodai* in front of the foot of EN 4.10. The kinked tip is hanging over the cloud ledge.

EN 4.10

EN 4.10 EN 4.12

Fig. 210
EN 4.11: tip of *piaodai* after finished stabilisation with steel wire and supportive fillings in 2012

Fig. 211
EN 4.11: tip of *piaodai* after temporary stabilisation with brass wire in 2011

EN 4.12

Fig. 212
EN 4.12: *piaodai* from shoulder to hip, left side, before treatment. The wire is already broken, but the edges are still touching each other (arrow)

Fig. 213
EN 4.12: *piaodai* after reshaping the wire

Fig. 214
EN 4.12: *piaodai* after reconnecting the broken wire with Japanese paper

Fig. 215
EN 4.12: *piaodai* after restoration in 2012

Fig. 216
EN 4.10 before treatment in 2011:
1 *piaodai* around head
2 *piaodai* between left shoulder and hip
3 decorative band on armour

Fig. 217
EN 4.10 after treatment in 2012:
the *piaodai* have been
1 stabilised with wire
2 re-attached to the figure and the wall
3 straightened and stabilised by supportive fillings

Fig. 218
EN 4.10, right hip, in 2011 before treatment with broken and loose *piaodai*
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 219
EN 4.10, right hip, after treatment in 2012: *piaodai* reconnected and stabilised with filling

Fig. 220
Northern group of *tianwang*, 2011 before treatment

Fig. 221
Northern group of *tianwang*, 2012 after treatment

stainless steel wire in 2012. This steel wire is flexible and could be easily bent to all required shapes. Its thickness of 0.8 mm was the same as that of many original wires.
For reconnecting broken wires, the ends were wrapped up in thin strips of Japanese paper and then coated with clay suspension. After drying, the reconnected parts could be covered with a clay filling (figs. 212 to 215). At several figures the *piaodai* around the head were broken and only the parts starting upwards from the shoulders were preserved (with clay modelling or without). In this case, the wire ring was closed by winding a new wire around the original one to prevent the fragile preserved parts from breaking off. All inserted wires were coated with Paraloid B 48 N (15 % in ethyl acetate) in 2012 in order to prevent corrosion.
The most difficult and time-consuming problems were raised by the *tianwang* EN 4.13, EN 4.14 (both with broken *piaodai* around the head), and EN 4.19: all preserved *piaodai* were damaged and broken, and in addition many small elements, such as strands of hair (EN 4.19) or decorations on the helmets (EN 4.13). The *piaodai* around the head of EN 4.9 had been flattened by EN 4.7 standing on it: It was realigned and brought back to its right position (figs. 207 and 208).
Fillings were only inserted if necessary to increase the stability and prevent further losses. Especially at the *piaodai* it was often necessary to insert fillings or to remodel a missing section. The material for the fillings consisted of clay with hemp fibres (from hemp paper) and an inert filler. In 2011, sand was used, in 2012 the sand was replaced by the finest quality of pumice powder[20] in the ratio 2 volume parts clay with fibres + 1 volume part pumice powder.

Beaded chain pendants
The wire core often is so fragile that it breaks at the slightest mechanical stress. Almost all the beads have got cracked because of the increase of bulk of the corroded wire, and tend to fall off. Numerous bead halves and some fragments of pendant chains were found at and in front of the wall (fig. 46). Even more came down during the period of work.[21]

In 2011, the problem of the corroded wires could not be solved. At the end of the work stay, the fragile fragments were stored. It was decided to postpone the question to the next year. The three larger elements of beaded chains -, F 194 from the central arm of the canopy, F 195 from the crown of *pusa* EN 4.22 and F 108 which was found lying on the top of the canopy - , were carefully packed and stored for the winter.
In 2012, the question of how to deal with the corroded wires was discussed again to find a suitable conservation method. Principally, there is no possibility to regain the lost strength of severely corroded iron wires. The wires can break under strain, and larger elements even can do so under the "stress" of their own weight. Where the clay modelling is lost, the corrosion is intensified. Larger elements attached at one end (as the beaded chain pendants decorating the canopy) tend to break at the sections where the wire is exposed. The result of this are fragments that show no or only very short ends of wire sticking out of the clay modelling (as at F 105, upper end: fig. 224). It is not possible to obtain sufficient adhesive strength by gluing the broken wire edge to edge and stabilising it with a bandage of Japanese paper.

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[20] Bought in Germany, Kremer Pigmente company, quality "Bimsmehl sehr fein 00" (not available anymore).

[21] Two fragments of chain pendants were preserved in-situ: F 194, hanging on the middle arm of the canopy (fig. 229), and F 195, from the crown of *pusa* 4.22 (fig. 236). F 105 (fig. 224) was found on top of the canopy. From the floor and next to *pusa* EN 4.21 the following fragments were collected:
- beads, many broken: F 12, F 18, F 21, F 36, F 98, F 104, F 106, F 107, 158, F 162, F 201, F 214, 242, 243, 244
- cloud elements: F 53, F 119, F 188
- rosette elements: F 12, F 15
- hanging pendants: F 117, F 198
Of these some still have fragments of wire core: F 12, F 18, F 21, F 117, F 119, F 198, F 243.

A bigger intervention with loss of original material, but with the result of a good long-term stability is to exchange the wires. Even if the loss of the original wires is accepted, there remains a problem: the clay modelling adheres tightly to the corroded wire - the stronger the corrosion, the better the adhesion. Often clay elements, especially beads, cannot be taken off from the original wire without breaking them. As the clay elements contribute to the mechanical stability, each broken bead is a reduction of stability of the whole element.
In addition, suspended elements, which can be seen from almost all sides, raise the problem that attached support structures are visible and may impair the visual impact. An attempt to use sewing threads for stabilisation was a test for a rather unobtrusive support. It turned out to be not strong enough to prevent the corroded wires from breaking at the slightest strain, and there were also concerns regarding the long-term stability. In the end, two different possibilities were developed:

1. Regarding larger elements which carry a heavier weight and require a higher mechanical stability, broken or heavily corroded wires should be exchanged.
2. If exchanging is not possible without damaging the clay modelling or if the wires are not broken, but only endangered, the original wire should be glued (if necessary) and the whole element supported by an additional wire. When the beaded chain pendants are freely hanging in front of the wall (so that parts of the reverse and the wire between the beads are visible), the support wires are discernible on looking more carefully, but they are not conspicuous because they are mainly fastened at the back of the pendants.

As there is little to be gained from hundreds of fragments stored in boxes, the tendency is to stabilise as many fragments as possible, to re-assemble them to larger elements and re-attach them to the wall. Only if no solution for a stabilisation can be found, the fragments should be kept stored in the future. The conservation work focussed on the three larger elements, F 015, F 194 and F 195 (fig. 222). The treatment of these fragments showed that wires can be exchanged if it is possible to separate the clay elements from the wire, but as this cannot be done without damaging broken parts further, it should be restricted to situations where no other way of mechanical stabilisation is possible.

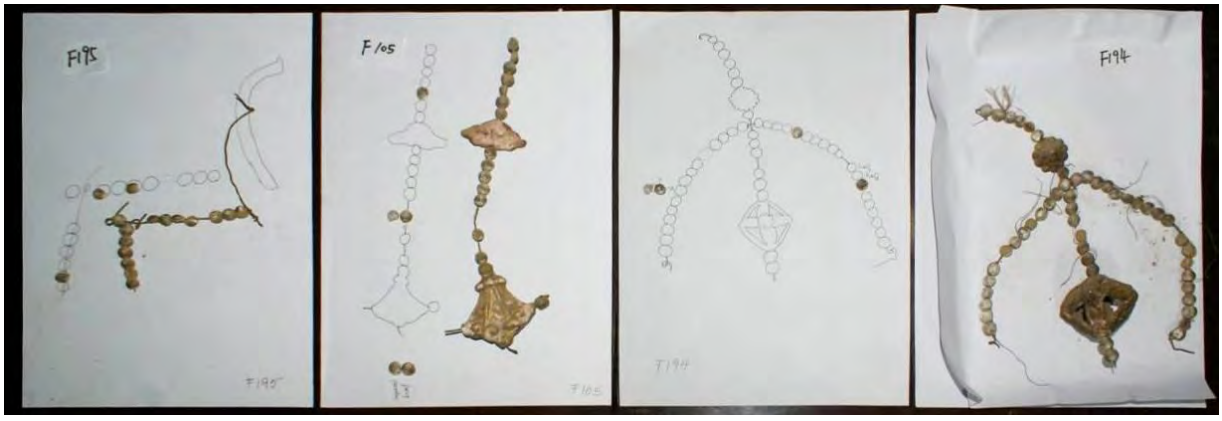


Fig. 222
Fragments F 195, F 105 and F 194 (left to right) before beginning of the treatment in 2012

The fragment had been found lying detached on top of the canopy in 2011 (fig. 223). Its original position is not clear, the upper end is broken off so it could not be attached anymore.

In 2012, the wire was carefully straightened and coated with Paraloid B 48 N. A drawing of the fragment helped to store detached beads during the conservation in the right order (fig. 224). The broken and detached beads were stabilised and re-attached using a clay suspension with addition of Tylose MH 300 to increase the adhesion strength. Lost parts of beads were remodelled to increase the stabilisation (clay + hemp fibres + Poraver 0.1-0.3 mm; fracture edges moistened by 0.5 % Tylose MH 300 before applying the filling material). Two missing beads were replaced by newly modelled ones (clay + fibres + pumice powder).

Fig. 223
Situation before treatment in 2011: fragment of beaded chain pendant F 105 lying on top of the canopy

Fig. 224
F. 105 at the beginning of the treatment in 2012. The drawing served to place detached beads during the conservation.

Fig. 225
F 105 during restoration: The beads have been glued, missing parts of beads remodeled. A steel wire supports the corroded iron wire.
[Gao Yan, Shaanxi Institute for Conservation]

front reverse

A stainless steel wire was attached to stabilise the fragment. It is mainly visible on the reverse side (fig. 225). A wire loop was attached between the first and the second bead (counted from top). The end of the wire was bent into a hook which served to attach the fragment to the wall.

The original position could not be reconstructed even by careful comparison with other beaded chain curtains. The observation of the canopy of the *amitou fo* (middle wall, front, northern end), which is the best preserved one, showed that the curtains originally were designed symmetrically. This means that fragment F 105 cannot have hung directly on one of the arms of the canopy, but probably was part of a lower level. Nevertheless, it was decided to attach F 105 to the southern arm of the canopy where it looks like the counterpart of the one preserved on the northern arm, and supports the impression of a beaded chain curtain although it does not show the same elements (fig. 250). The hook at the end allows to remove F 105 easily if the correct position should be found or if the opinion about a convenient position should change.

F 194

The fragment consists of two parts: a central chain, ending in a spherical decoration element, and a transverse chain. Both ends of the transverse chain end in loops, showing that they had originally been attached to other wires, but as these are lost they nowadays hang unconnected. After the fragment of the beaded chain pendant had been detached from the middle arm of the canopy in 2011, it broke into several parts and could not be re-attached. The first attempt was to reconnect the broken ends by bridging them with Japanese paper, coat this with Paraloid B 72 and attach a glued or reconstructed bead over the break. Additionally a system of sewing strings was attached (fig. 229). This method failed because the beaded chain pendant remained too fragile that it broke again under the stress of moving it to attach the sewing strings.

This method failed because the beaded chain pendant remained so fragile that it broke again under the stress of moving it to attach the sewing strings.

Fig. 226
F 194: Bridging the broken wire of the central chain with a strip of Japanese paper.
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 227
F 194: Starting to pull the bead of the transverse chain onto a new wire and to stabilise them
[Gao Yan, Shaanxi Institute for Conservation]

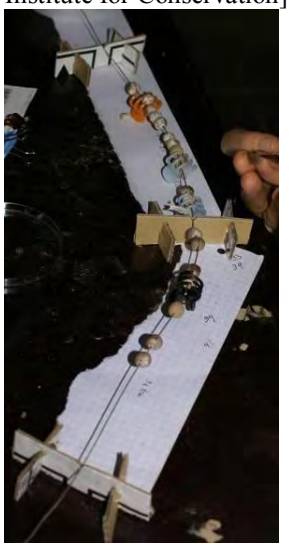


Fig. 228
F 194: Beads of transverse chain threaded onto new wire. The drawing of the old wire served to achieve the correct curvature of the new wire. Upper right: Some of the reconstructed beads

Fig. 229
Fragment F 194 in Nov. 2011. Hanging with hemp fibres from 1981-85: blue arrow. First attempt to bridge breaks and stabilisation with sewing thread (breaks and new beads: red arrows).

Fig. 230
Fragment F 194 in 2011 during removal of the reconstructed beads and the sewing strings

Fig. 231
Fragment F 194 after treatment, front
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 232
Fragment F 194 after treatment, reverse
[Gao Yan, Shaanxi Institute for Conservation]

In 2012, the decision was made to replace the wire of the transverse chain, because it was broken three times and almost all beads were not tightly connected to the wire anymore. At the central chain, which was broken into two parts, the beads showed a very good adhesion to the wire, however, and could not be removed without breaking and damaging them. The chain therefore had to be stabilised. Additionally a new hanging construction had to be attached, because the existing one consisted of a fragile and thin bundle of hemp fibres attached between the second and the third bead at the upper end (see fig. 229, blue arrow).
The beads were numbered and removed from the transverse chain. Some broke, and in the case of two beads the wire remained inside. A stainless steel wire of 0.8 mm was prepared by coating it with Paraloid B 48 N. The wire had to be bent down successively to the curvature of the original wire, as it would not have been possible to thread the beads onto a bent wire. Lost beads were replaced by new beads made of clay (clay + fibres + Poraver 0.1-0.3 mm as filler, fig. 228).
A second hole was drilled through the two beads from which the original wire could not be removed. At the ends, two tiny beads modelled with the same mixture were added to prevent the original beads from sliding down the wire.
The break in the central chain was bridged by wrapping Japanese paper around the broken wire and coating it with Paraloid B 48 N (fig. 226). A bead was modelled over the connection, replacing a lost bead. A support of stainless steel wire was attached to stable parts of the central chain. It is mainly visible on the reverse of the fragment. A wire loop at the end of the support wire served to re-attach the fragment to the canopy. A thinner wire was used to connect the two arms in the same way as it had originally been done.

F 195
The small beaded chain decoration at the left side of the crown of *pusa* EN 4.22 was very fragile. It is a fragment of a decoration that can be interpreted as a small version of the crown of the *yaowang pusa* at the southern insertion wall: Beads threaded on wire surrounding the crown like a filigree "cloud" of pearls or jewels (fig. 233). A wire spiral (clay modelling lost) which could be re-attached to the crown of pusa EN 4.21 also points to this interpretation (fig. 234). The fragment preserved at the crown of *pusa* EN 4.22 consists of three parts: A wire sticking out nearly horizontally from the crown, and two small beaded chains hanging on it, one attached to the end of the other. The lower one consists of six beads. It broke off directly at the crown at the beginning of the work in 2011. The original design is not documented and cannot be reconstructed (fig. 235).
In 2011, an attempt was made to stabilise and re-attach the broken beads (fig. 236). The wires and the beads remained very fragile, however. In 2012, the wire of the horizontal part and that of the upper beaded chain were exchanged against a stainless steel wire to guarantee the stability of the fragment. All beads were cracked and had to be glued. In the lower beaded chain with six beads, the original wire was preserved (fig. 237). A tiny "knob" was added at the end to prevent the beads from sliding from the wire. The wires were coated with Paraloid B 48 N to prevent corrosion. Missing beads were replaced by reconstructed ones and some that were found on the floor next to the *pusa*, so it is possible that they belong to the decoration.[22] Afterwards, F 194 was re-attached to the crown (fig. 238).

[22] They may also come from the canopy, whose beads have the same size, but are so similar to the ones of the crown that the original position of a detached bead cannot be reconstructed.

Fig. 233
Crown of *yaowang pusa* (before cleaning in 2010)

Fig. 234
Crown of *pusa* 4.21 after re-attachment of small red elements and the wire spiral, Aug. 2012

Fig. 235
Crown of pusa EN 4.22 before the beginning of the conservation work in 2011

Fig. 236
F 195, beaded decoration from the crown of pusa 4.22, Nov. 2011

Fig. 237
F 195, beaded pendant from the crown of *pusa* 4.22 after exchanging two of the wires and inserting new beads

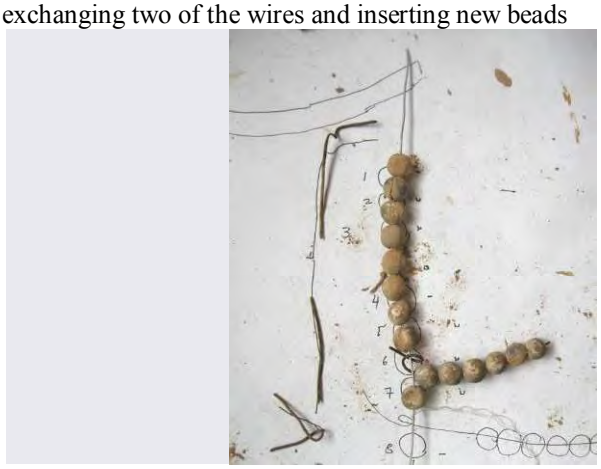


Fig. 238
Pusa 4.22 after re-attachment of fragment F 195 in Aug. 2012

The canopy and its piaodai

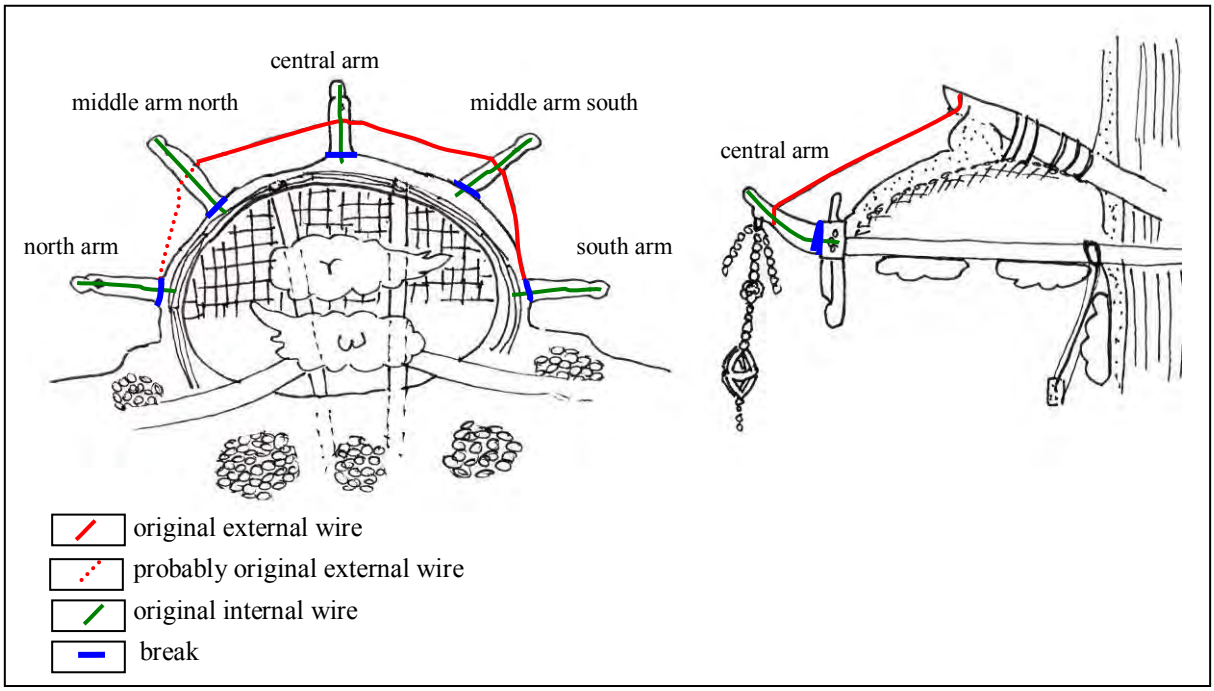
The canopy itself was stable, but damage had occurred to the parts attached to it: the arms originally supporting a curtain-like system of beaded chain pendants, and the *piaodai* underneath the canopy.

Arms of the canopy

The five arms protruding from the ring of the canopy were bent sideward and downwards, obviously as a result of mechanical damage caused by human interaction. As the arms are interconnected by wire, bending one arm results in the others breaking off. The wire connection between the two arms at the northern side was probably broken by that, and the wire got lost (fig. 239). This caused the clay modelling to break away at the base of the arms, exposing the wire inside (figs. 240, 242).

The first step of the conservation treatment was to bend the wires by pliers in order to force them back to the right shape. For the three arms in the middle which are still interconnected (middle arm north, central arm and middle arm south) this was difficult: The original external wire is slightly bent and thus too "short" to allow an appropriate correction of the arms. For this reason, the external wire was adjusted cutting slightly into a damaged area of the middle arm south. After adjusting the arms (fig. 240), the gaps between arms and canopy were filled first by injection with clay mixture with pumice and later with clay + hemp fibres + sand (fig. 243). The arms had been decorated with flower ornaments which are preserved at the north and south arms, but bent down: They were straightened up until they pointed upwards again (figs. 246 and 247), and stabilised. The beads on the fragmented pendants at the central arm were stabilised by injection of clay suspension.

Fig. 239
Canopy, schematic view from underneath and section from the side:
Original wires and breaks caused by bending them



▲ Fig. 240
Canopy, north arm: reshaped and temporarily stabilised

◀ Fig. 241
Canopy, north arm: before treatment

Fig. 242
Detail of arm with original wire reinforcement

Fig. 243
Arm after filling and reshaping flower ornament

Fig. 244

Canopy, north arm: after treatment

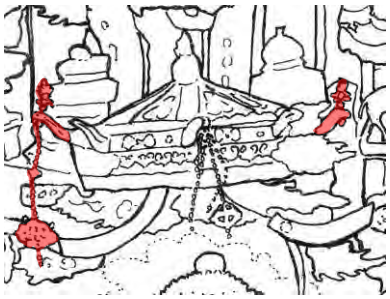


Fig. 245
Canopy, south arm and part of mountain scenery during work with temporary fixations

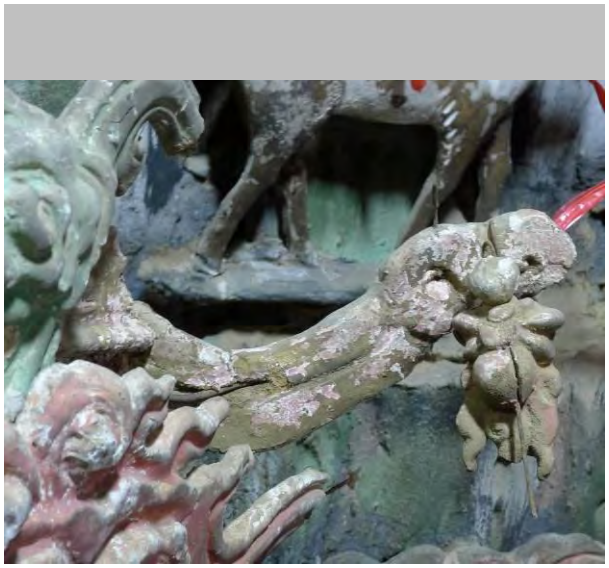


Fig. 246
Canopy, south arm: before treatment

Fig. 247
Canopy, south arm: reshaped and flower ornament straightened up

Fig. 248
Canopy, south arm: flower ornament held in position by strings

Fig. 249
Canopy, south arm: flower ornament stabilised by clay filling at the base

Fig. 250
Canopy after conservation and re-attachment of the beaded chain pendants in August 2012

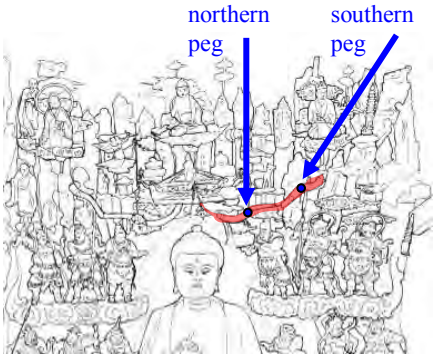
Piaodai *of the canopy*

Both *piaodai* have been modelled over a strong wire attached to two pegs by hemp strings (figs. 258, 259 a). The connection of the northern *piaodai* to the pegs had been repaired in 1981-85, and a lost part of the clay modelling in the middle of the *piaodai* had been completed.

At the southern *piaodai*, the connection of the clay modelling to the pegs had been loose or lost in 1981-85: It was fixed by a rather flimsy string of hemp fibres near the southern peg (probably to keep the attachment almost invisible), and a thick filling was applied between the peg, which is inserted into mountain S 11, and the clay modelling of the *piaodai* (figs. 259 b, 255). In 2011, this filling was loose and without connection to the *piaodai*. The southern peg and the *piaodai* were not interconnected anymore, the tip of the peg was several cm away from its hole inside the *piaodai*. This means that the wire of the *piaodai* had been bent, so that the original joints are not fitting any longer.

After the filling around the southern peg had been removed, the wire inside the *piaodai* was reshaped until it was possible to insert the pegs into their holes again. A brass wire was threaded through the coils of hemp string around the hole (fig. 251) and fastened around the peg (figs. 252, 253, 256). After that, the connection was covered and stabilised by an application of clay (clay + hemp fibres + sand), which was enlarged at the back of the *piaodai* to increase the contact area (figs. 259c, 254, 257).

Fig. 251
Canopy, southern *piaodai*, northern fixation point:
Begin of treatment: A brass wire is threaded through to the hemp rope inside the *piaodai*



Figs. 252 and 253
Canopy, southern *piaodai*, northern fixation point: The brass wire is attached to the wooden peg

Fig. 254
Canopy, southern *piaodai*, northern fixation point: After filling the joint and covering it with clay mixture

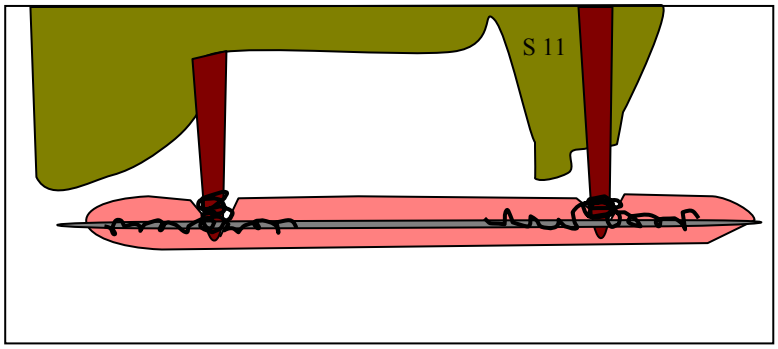
Fig. 255
Canopy, southern *piaodai*, southern fixation point at mountain S 11: Before treatment, with completion from 1981-85

Fig. 256
Canopy, southern *piaodai*, southern fixation point: Brass wire threaded through the hemp rope inside the *piaodai* and attached to peg.

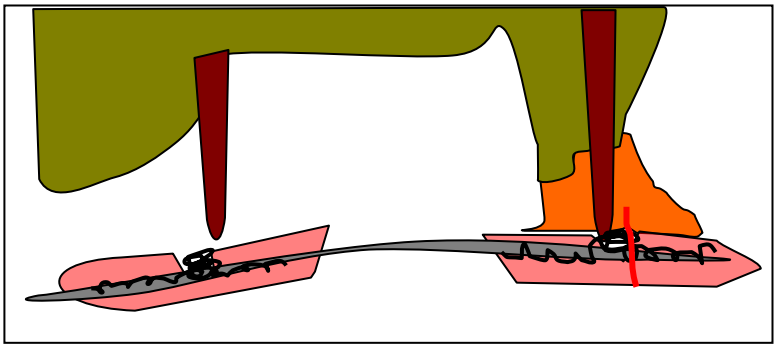
Fig. 257
Canopy, southern *piaodai*, southern fixation point: After covering wire and peg with a clay mixture. The rough surface of the mountain behind is the completion of the damaged or lost peak made in 1981-85.

Fig. 258
Southern *piaodai* of canopy with the position of the two pegs (brown)

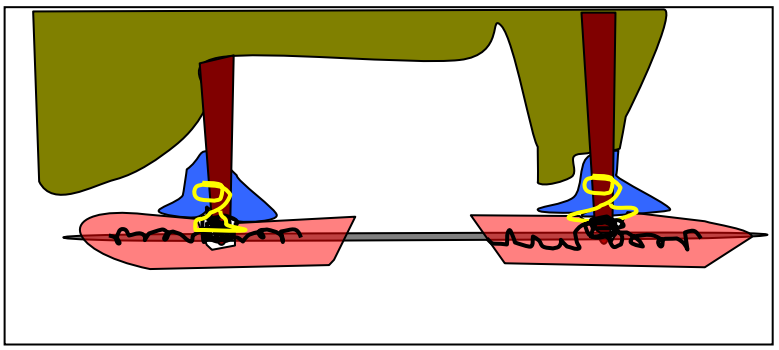
Fig. 259
Schematic view of southern *piaodai*, seen from above, with joint to wall.



a. Original situation: Two pegs (brown) inserted into the mountains (green). *Piaodai* (red) modelled over wire (grey) and attached to pegs by hemp strings (black)



b. Situation after repair in 1981-85, before treatment in 2011: *Piaodai* attached to mountain S 11 by hemp fibres (red) and clay filling (orange). The wire inside the *piaodai* is bent, a part of the modelling is missing



c. Situation after treatment in 2011:
The wire has been reshaped. The *piaodai* is attached to the pegs by brass wire (yellow). The connection is stabilised and protected by a clay filling (blue).

Lifting of *pusa* EN 4.21

The question of how to treat the unstable support of *pusa* 4.21 could not be solved in 2011 as there was no time for this major intervention and thus was postponed to the work stay in 2012.

Preliminary considerations
In 2011, the removal of the repair plasters between the pedestal of the *baoshen fo* and the *pusa* showed that the dais was sincerely damaged. Underneath the later plaster layers only fragments of adobe bricks were found, while most of the bulk consisted of clay powder. Only towards the front of the dais which still shows the original, unpainted surface between the *pusa* and the *jingang* of the northern gable wall, the dais still is stable. The fragmented adobe bricks were soft, in lower layers slightly damp and of very low mechanical stability. Only part of the powdery material was taken out in 2011 because it was to be feared that the *pusa* might tilt or even fall down. The realisation that most of the inner structure of the dais nowadays consists of clay powder meant that the dais could not be repaired without removing the *pusa* from his place. It also means that the pedestal of the *baoshen fo* and the underground of *pusa* EN 4.22, too, may be endangered. The fact that they did not break through the surface of the dais may result from the fact that they are connected to the wall and not only standing on a pole inserted into the dais. This can also mean that the situation is only stable as long as no new damages occur at the lower part of the wall.
Besides the aspects of stability, the brick revetment of the dais and the raising of the level of the dais surface are aesthetically unsatisfying. The feet of the pedestal of the *baoshen fo* and the lotus pedestal of *pusa* EN 4.22 are hidden under the repair plasters.

For removing the *pusa* from its place, two alternatives were discussed: either to lift the figure high enough to work underneath or to take it out. There were differing assumptions with regard to the weight of the figure. A rough calculation can be made starting from the fact that the shape of the *pusa* can be compared to a living human and from the specific weights of clay mixtures. The *pusa* measures 117 cm in height (including the lotus pedestal but without the crown). A child of 120 cm in height weighs about 25 kg in average. The specific weight of humans can be calculated with about 1.0. The specific weight of rammed earth is about 1.5-2.2, clay-straw mixtures are about 1.2-1.7, and clay plasters depending on their composition between 0.4 and 1.0. This means that even with adding some weight for clothes and pedestal and taking a high specific weight for clay mixtures, the weight cannot exceed 60 kg and probably is much lower. As there is very little space in the corner where the *pusa* is standing and the draperies of the garments, the arms, the head and the jewellery on the crown and the body are fragile parts, the figure is difficult to lift and hold. Furthermore, the overhanging upper parts of the wall made it difficult to pull it up high enough to lift it over the protruding arm of the *jingang* and the edge of the pedestal of the *baoshen fo*.
In the end, it was decided to lift the *pusa* using a pulley, to build a temporary platform high enough to work below it as a temporary stand, to repair the dais and the wall sections behind the *pusa* (GN wall and EN wall) and then to lower the *pusa* again to bring him back to his original place.

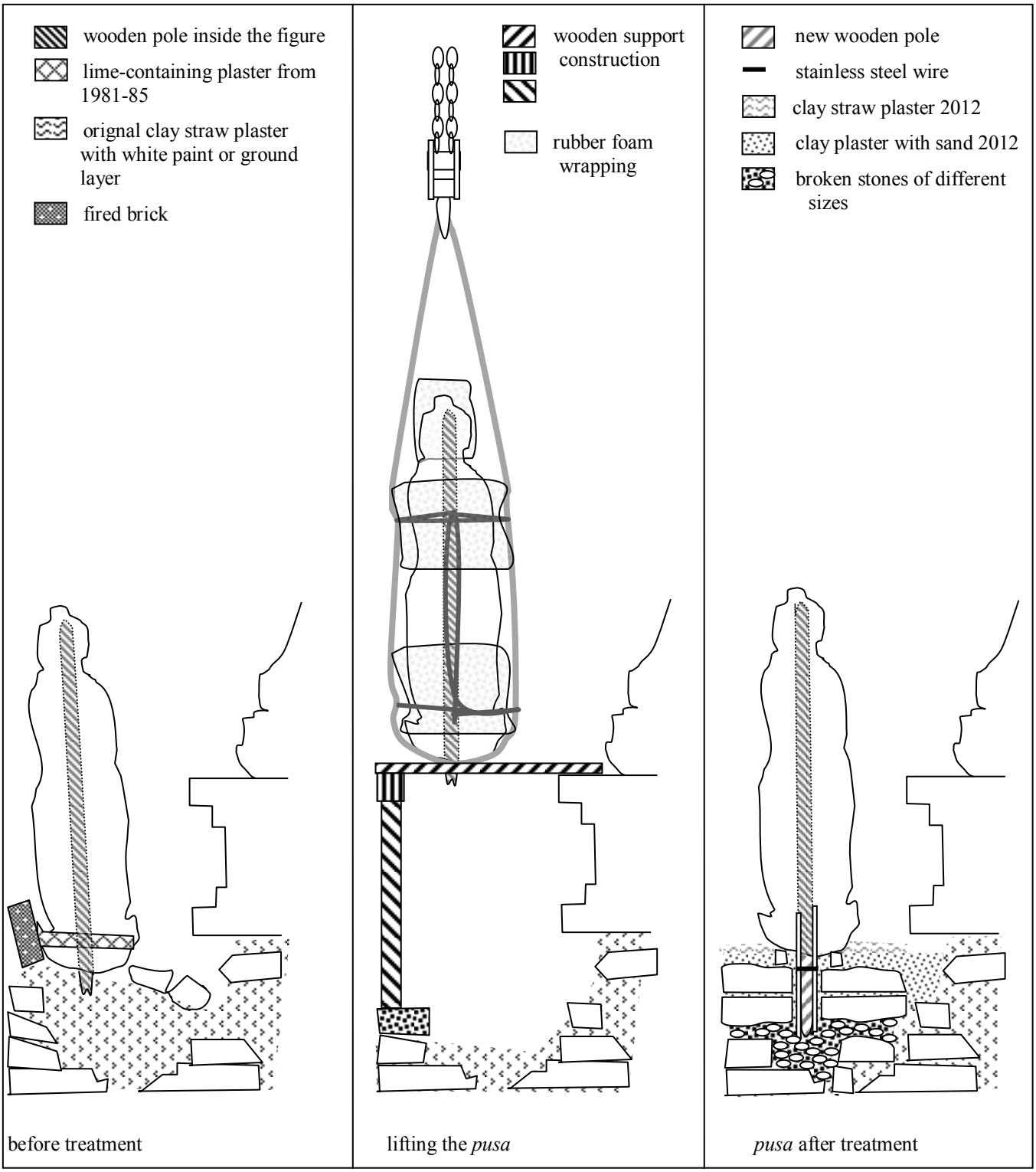


Fig. 260
Schematic view of lifting and re-inserting *pusa* EN 4.21 in August 2012

Steps of treatment
The work was carried out in the following steps (in chronological order):

1. Removal of debris between *pusa* and pedestal of *baoshen fo*
In 2011, the later plaster layers on the top side of the dais were removed. After that, fragments of deteriorated adobe bricks and fragments of the wall decoration were taken out. The area filled with this debris extended from the pedestal of the *baoshen fo* to the left side and the back of *pusa* EN 4.21. Material on the front and the right side (towards the GN wall) was not removed in order to prevent a destabilisation of the figure.
After a temporary support with wooden laths was built to prevent the figure from tilting, more debris was removed in August 2012 (fig. 262).

2. Lifting the *pusa* with a pulley
The pulley was attached to the bars of the scaffolding in such a way that the figure could be pulled up about ca. 60 cm. The figure was wrapped in strips of rubber foam covered with soft tissue paper around the body and the head. Belts holding it underneath the lotus pedestal were secured around the body with ropes to prevent the *pusa* from tilting (fig. 263, 264a and b). Another layer of rubber foam was wrapped around the body to protect it (fig. 265). The thick wrapping resulted in a very safe protection of the figure, but it almost filled the limited space of the corner (fig. 266). The pulley chain was drawn by hand. During the lifting, the figure was stabilised by hand against swaying to prevent it from touching the wall.

3. Building a temporary support
The support consisted of two wooden planks on which the *pusa* was set. Between them there was a gap so that the protruding end of the pole underneath the lotus pedestal was not damaged (fig. 267). The planks were resting on a wooden prop which was inserted next to the northern gable wall and based on a fired brick, and on the top of the pedestal of the *baoshen fo.* The pulley served to hold the figure upright (fig. 260, center).

4. Removing the debris from underneath the *pusa*
Sand and rubble were taken out underneath and behind the *pusa*. About 390 additional fragments of the modelling of the walls were found, most of them small ones. The clay powder was sieved after taking it out from the dais to discover even small fragments as beads and decorations of the headgears. Fragments of adobe bricks were removed as well. Some were interspersed with white spots (salts and/or inclusions of lime or gypsum?).

5. Preparing the dais for rebuilding
Near the floor level, more solid adobe bricks and river stones became visible inside the dais. The clay powder was compacted with a larger stone. Irregular cavities were levelled by a fill of broken stone (angular edges). After larger stones (up to 4 cm long, fig. 271) had been put in, smaller ones (1-2 cm long) were used to fill the remaining gaps (fig. 272). Afterwards a layer of coarse sieved sand (> 0.4 mm) was applied. A segment of a wooden pole served as placeholder to prevent sand, stones or clay mortar to fill the hole by accident.
The fired brick underneath the temporary support was replaced by an adobe brick.
The voids reaching underneath the pedestal of the *baoshen fo* and next to the front of the dais were filled with fragments of adobe bricks, clay mixture and partly with stones.

Fig. 261
Pusa EN 4.21 seen from top before treatment in 2012: Part of the debris between *pusa* and pedestal of *baoshen fo* was already removed in 2011

Fig. 262
Pusa EN 4.21 during removal of debris in 2012: larger pebble from foundation of the dais (in front), modern brick supporting the *pusa* (left side)
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 263
Preparation of *pusa* EN 4.21 for lifting: Securing the belts which hold the figure; temporary support of the figure with wooden laths

Fig. 264 a and b
Pusa EN 4.21: Protection with strips of rubber foam; wooden spacer inserted at the top of the belt loop

Fig. 265
Pusa EN 4.21: Wrapping the figure with another layer of rubber foam

Fig. 266
Lifting *pusa* EN 4.21 into the restricted space between figures, scaffold and *baoshen* fo; the pulley is attached to a scaffold bar.

Fig. 267
View underneath the lifted *pusa* EN 4.21: The figure is standing on a wooden support construction through which the decayed wooden pole of the figure protrudes. In the lower part behind the figure the original unpainted plaster is visible.

Fig. 268
Pusa EN 4.21: Inserting threaded steel bars next to the decayed pole

Fig. 269
Pusa EN 4.21: Decayed pole end sawn off plane. New wooden pole secured with the steel bars and wire

▲ 270

Fig. 270 – 276
Pusa EN 4.21: Rebuilding the dais and treatment of the walls

Fig. 270
Inside of the dais after removal of debris

Fig. 271
First layer: coarse stones

Fig. 272
Second layer: smaller stones

▲ 271

▲ 272

▲ 273

▲ 274

Figs. 273, 274
Dais rebuilt with adobe bricks; channels for filling the hole around the pole are still open

Fig. 275
Lower part of GN wall before treatment

Fig. 276
GN wall after grouting and filling (still wet)

▼ 275

▼ 276

Fig. 277
Pusa EN 4.21 re-inserted into the dais; wooden wedges serve as temporary adjustment of the position
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 278
Pusa EN 4.21: Covering the top of the dais with layers of clay plaster

Fig. 279
Pusa EN 4.21, after removal of debris from dais, Aug. 21, 2012

Fig. 280
Pusa EN 4.21, after treatment, Aug. 30, 2012

6. Rebuilding the inside of the dais
Adobe bricks taken from an old farm house (living quarters, not barn areas) were used to rebuild the dais. Two layers of adobe bricks were put inside, touching each other with the flat side (at the lower layer the flat side is at the top, at the upper layer it is at the bottom, see fig. 260, center). As mortar a mixture of clay and sand was used.
The area for the pole of the figure was omitted in the adobe layers. Additionally two vertical channels were constructed, one pointing towards the pedestal of the *baoshen fo*, the other towards the front of the dais, by leaving a gap of 4-5 cm in width between the adobe bricks (fig. 273, 274). Through these channels a clay mixture could be injected later on in order to fill the space between the adobe bricks and the wooden pole. The height of the adobe bricks was calculated to measure several centimetres below the original surface of the dais to apply a layer of plaster after inserting the *pusa*. As next to the bottom the lotus pedestal of the *pusa* shows a strip of 2 cm in width, which is unpainted and not finely modelled, it was deduced that this part had originally been covered with the plaster at the top of the dais.

7. Reinforcement of the wooden pole inside the *pusa*
The decayed wooden pole ended in a splintered fracture edge about 8 cm below the bottom of the lotus pedestal (fig. 267). The splintered end was cut off straight. Four threaded bars made of stainless steel (diameter 6 and 8 mm, 50 cm long) were inserted next to the pole, as deep into the figure as possible (about 30 cm deep inside the figure, 20 cm sticking out, fig. 268). A new wooden pole of 12 cm in length was inserted between the threaded bars. The new pole, the original pole and the threaded bars were tied together with stainless steel wire (fig. 269).

8. Grouting of voids inside the wall behind the *pusa*
Before the *pusa* was lowered again, voids inside the wall behind him were treated because these areas would not be accessible anymore once the *pusa* would be back in his place (fig. 275). Even without the *pusa*, it was difficult to work in the limited space between the pedestal of the *baoshen fo* and the *jingang* of the northern gable wall. The voids mainly consisted of areas where the plaster had become detached from the wall, but there were also two deeper cavities. To fill the cavities, the mixture HFM 8 (clay + micro-balloons + Tylose MH 300) was injected using thin tubes (fig. 276).

9. Re-inserting the *pusa*
The pusa was carefully lowered. The pole was inserted into the opening. Afterwards the position of the pusa was carefully adjusted, regarding the turning of the body towards the *baoshen fo* and making sure that it was standing straight. Temporarily the position was secured with wooden wedges (fig. 277). Small pieces of adobe bricks were inserted around the pole and underneath the lotus pedestal until the wooden wedges could be removed.
Coarse sand was filled in around the pole of the *pusa* (about 14 cm high) to lock the figure in place. Between the lower side of the lotus pedestal and the adobe bricks, a clay-straw mixture was inserted. Stones and pieces of adobe bricks (both as big as possible) were added to increase the mechanical stability and reduce the water content of the layer. Because the gap partly was up to 3 cm in width, the filling was done in two applications: After the first application had dried for two and a half days (the weekend), the belt for the pulley was removed from underneath the *pusa*. During the second application the channels, too, were closed, and gaps in the upper layer of the adobe bricks as well (fig. 278).

10. Applying a new plaster at the top of the dais
After the second application of the clay filling underneath the *pusa* had dried for 24 hours, the top of the dais was covered with a first layer of plaster (clay-straw mixture with some sand prepared by Mr. Xu Liujin). A second layer was applied another 24 hours later. After waiting

for another day, small holes and cracks were filled and the surface could be smoothed (fig. 280).

Grouting of voids

Voids caused by detachments of the modelled surface were found next to cracks in the mountain scenery and in the lower part of the wall, especially behind the *pusa* figures.

Grouting of the voids was started in November 2011 on one smaller area between the left foot of EN 4.20 and the southern wall edge: The white plaster containing lime and animal hair dating from 1981-85, which was overlapping the stem of the cloud ledge, was removed as far as it covered the original paint layer (figs. 281 and 282). The powdered clay material was removed as far as possible, and a wasp nest in addition. The void was filled in several steps by injection (clay + pumice). The rather small, but deep area took over a week to dry (figs. 283 and 284). The cold and wet weather retarded the drying. It was necessary to wait for some days before the next amount of clay mixture could be injected. The long drying process also increased the danger of water marks forming on the surface. The hole still visible in fig. 284 was closed in 2012.

Fig. 281
Tip of tunic of EN 4.20 and stem of cloud ledge before treatment

Fig. 282
After removal of fillings from 1981-85

Fig. 283
EN 4.20, void behind hole of lost *piaodai*, before treatment

Fig. 284
After grouting (background still moist), Nov. 2011

In August 2012, the grouting was continued. The treated areas dried much faster due to the high summer temperatures, even though the humidity tended to be high as well. The grouting was carried out behind *tianwang* EN 4.10 during the re-attachment of the figure and behind the *pusa* figures EN 4.21 and EN 4.22. The wall behind *pusa* EN 4.21 was treated while the *pusa* was lifted. Besides the EN wall, the lowest part of the GN wall was treated too as it was accessible only before the *pusa* returned to its original position. In both cases polyethylene

tubes were inserted into the cracks, and the voids were filled by several applications of clay mixture HFM 8 over two days (fig. 285). The lower, broken-off margins of the original plaster of the EN wall behind *pusa* EN 4.21 was stabilised by a sloping application of clay plaster (*mazhi ni*: clay + sand + hemp fibres).

Fig. 285
Grouting of voids behind the original plaster layer between the pedestal of the *baoshen fo* and *pusa* EN 4.22

Recipes of clay mixtures

The recipes used for the clay mixtures are based on the experiences with the mixtures tested and proven in 2007, 2008 and 2009.
The base of the mixture is so-called "black earth" 黑土 from the flank of the Wangshun mountains south of the temple. In the beginning, earth left over from 2009 was used. Then new material was brought from a "place near the road" which is said to come from the mountain, too. It had already been stored and was almost dry. The new material is a bit lighter in colour and thus not exactly the same as that used in 2009.
The black earth was crushed and sieved through a coarse sieve. For preparing mixtures for injection, the clay powder was sieved again using a 0.4mm sieve.
The ratios given in table 13 indicate the amount of material provided for the preparation of the mixture. Water can be added during the work according to the needs, and has to be added constantly as it evaporates especially during the warmer seasons.

Table 13
Mixtures of clay used in 2011 and 2012

Name	*purpose*	*ingredients*	*parts by volume*	*preparation*
clay suspension HFM 1	pre-moistening and connecting parts with very fine cracks by injection	clay, sieved water sand, 0.2 mm	5 10 1.5	Mix at least 24 hours before use stir and dilute directly before use
clay mixture HFM 8	grouting and filling	clay, sieved water micro-balloons Tylose MH 300, 3 % in water	6 4 15 2	Mix clay powder and water, add micro-balloons and Tylose mix at least 24 hours before use; stir and dilute directly before use
clay mixture with pumice powder	filling and grouting of larger voids and cracks by injection	clay, sieved water pumice powder, finest quality	5 5 7	Mix clay with water, wait 48 hours add pumice powder add water according to need
clay with hemp fibres *mazhi ni* or *xi ni*	filling of holes in the finish coat completions of the modelling re-attachment of small parts	clay sand hemp paper water	10 2 ad libitum 7-10	Mix crushed clay with sand, add some water, add paper etc. stir, wait for at least 24 hours stir again, add water if necessary
clay with hemp fibres and pumice powder	completions of the small broken parts like *piaodai*	clay sand hemp paper water pumice powder, finest quality	10 2 ad libitum 7-10	2 parts of clay with fibres + 1 part of pumice powder (parts by volume)
clay straw mixture *cu ni*, as prepared by Cai Bo, 2011	filling of larger parts in the wall or undercoat plaster	clay straw cut into pieces of 3-4 cm water		Mix clay with water, add straw, mix thoroughly
clay-straw mixture *cu ni*, as prepared by Xu Liujin, 2012	filling of holes in the finish coat completions of the modelling re-attachment of small parts	clay sand water straw	1 big bowl 3 hands as necessary half as much as clay	1. Fill half of a washing bowl with clay which is fine, but not sieved 2. Add three hands full of sand (coarse, but sieved (< 1 mm)) 3. add water until clay is covered; do not stir but wait until no more air bubbles rise from the clay (about 10 min.) 4. Put cut straw on top (about half the volume of the clay) and start mixing 5. Mix and knead until a soft coherent dough emerges 6. Wait at least for one hour If used rather softly, it is not necessary to pre-moisten the adobe bricks.

TABULAR OVERVIEW OF TREATMENTS

Treatment carried out in 2011

I. Figures and elements of the mountain scenery

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done after 2011*
EN 4.1 monk + tip of S 23	figure + modelling of mountain to reed bundle: - wire from 1981–85 removed - position adjusted: shifted to the front and to the right - consolidated by injection - gap between mountain and back of monk filled and enlarged at the lower edge to increase joining surface	- after consolidation of mountain: wire around mountain tip replaced by hanging wire; fixation no. 1, attached to *fangmu*		
EN 4.2 *kongzi* and EN S 28		- wire through mountain replaced by hanging wires: fixation no. 5: tensioning device: turnbuckle with two jaws to *fangmu*; bamboo slips inserted at the holes for the wire (placed at the edges of the mountain) to prevent the hanging wire from cutting into the clay modelling	- *piaodai* around head: reshaped, loose parts glued to wire, brass wire behind broken part in the middle of the *piaodai* ring; missing parts completed with clay + hemp fibres + sand - cloud above head: re-attached to wooden pole with clay+ hemp fibres + sand - back covered with the same mixture	- to check tension of hanging wire around mountain of *kongzi* > if the tension is too strong the bamboo slips will be broken
EN 4.3 *shijia-mouni*		- hanging wire ring inserted, fixation no. 8: around the upper peg and two lower pegs behind the sculpture: wire rope ring attached to second ring which runs around bracket (flower arm); tension applied by turnbuckle with two jaws - wire from 1981–85 cut and removed behind the figure, but not from inside the fragmented background; tension on bamboo pole on the left side released	- fragment of *piaodai* on right shoulder reshaped and consolidated - four cloud parts removed behind figure: 1 complete cloud (F 177), 1 cut-off cloud (F 176), 1 half cloud used as spacer (F 175b), 1 half cloud from behind left hip (F 175 a); - F 175a and b reconnected - mountain S 25 removed from right side of corbel bracket: stored with findings - mountain S 26: *see: S 26* - part of cloud completion from 1981–85 temporarily removed from left side: re-attached	- if possible: re-attach clouds in their original positions
EN 4.4 *laozi* and EN S 6		- hole drilled through mountain at both sides of the figure to insert hanging wire, fixation no. 13; bamboo slip and screw to protect the edges of the holes from the hanging wire cutting into the clay - wires from 1981–85 removed: around mountain, below upper pole and below figure removed (without replacement)	- connection of both hands to sleeves consolidated by injection of clay suspension - bent tip of cloud on his left (towards T 1) straightened and glued with clay suspension - mountain behind *laozi*: small part on the left side broken due to tension of the wire> re-attached	- to check if attribute inside right hand needs stabilisation

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done after 2011*
EN 4.5 *feitian* and mountains S 18, S 26	- *feitian*: wire around belly cut, figure taken down; - removal of completion around wooden lath; removal of lath from hole in the mountain - mountain S 18 broken lengthwise by inserting lath: rejoined by injection of clay suspension - mountain S 26 re-attached to original position in front of S 18 and S 19; position of the holes secured by inserting chopsticks into the lower hole through S 26 into S 18 - *feitian* stored with findings - if mounted to the original peg holes, the *feitian* will be in a higher position than before and higher than *feitian* EN 4.6		- arms at elbows reshaped into right position; glued, gap filled with clay + hemp fibres + sand - both wrists: *as arms* - *piaodai* at hip: wires reshaped; at the right side broken wire connected with thread from hanging wire - feathers: wires reshaped into right position, consolidated; feather F 135 implanted - fragment of *piaodai* hanging from belt consolidated, but not re-attached yet - right head glued to neck	- to glue the right arm which is broken again, loose head, broken *piaodai* around head - re-attachment of the *feitian*: decision which material should be used as mounting device; decision on fitting height and distance to mountain; re-attachment onto mounting device - three small fragments of wings, found next to EN 4.22, could not be attached: new attempt ?
EN 4.6 *feitian* and mountain S 9	- *feitian*: wire around belly cut, figure taken down - removal of completion around lath serving as peg; removal of lath - mountain S 9 broken lengthwise by inserting lath: rejoined by injection of clay suspension - lath shortened - lath inserted into S 9; - search for fitting position of *feitian* on the base of un-painted area on mountain S 10 (originally behind left wing of *feitian*) and traces of pink paint at S 8 (behind end of skirt of *feitian*) - fixation of lath to upper pole by piece of pipe clamp and two screws to ensure the right angle - hanging wire loop around figure, at the belly wrapped up in Japanese paper to protect paint layer; carried through hole next to lath - clay with hemp fibres and sand put into hole in the back of *feitian* - *feitian* inserted onto lath tip and into wire loop, position adjusted - supporting filling between skirt and S 8 - pipe clamp around lath coated with clay suspension	- hanging wire around belly of *feitian* fastened to a pipe clamp around the lath at the back of the mountains - position slightly corrected according to unpainted areas on the wall> *feitian* now shifted more to the left (north) than before	- *piaodai* at the right side of body: wires reshaped into right position, broken wire reconnected by steel rope thread - *piaodai* at the left side of body: wires reshaped into right position - head glued to neck - feathers: wires reshaped into right position and glued	- option: to remodel missing mountain part behind the *feitian*

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done after 2011*
EN 4.7 and part of mountain S 23 attached to it	*figure had sagged down, standing on top of the piaodai of EN 4.9 and with the tip of the right sleeve on a canopy-shaped mountain of the GN wall* - removal from wall: taking the loose sculpture down (Oct. 28), without peg - preparation for re-attachment: -- hanging wire at the back of the shoulders attached to piece of bamboo inserted into the figure -- hanging wire attached around mountain: hole drilled between figure and mountain at the level of the thighs of the figure; attached to pipe clamp on the back to hold the two parts of the mountain together -- peg hole in figure and in mountain enlarged to insert peg in steeper angle (pointing more upwards), to get the figure in a higher and better secured position -- hemp string tied vertically from below the back of the garment to the clay coil above the peg; broken clay modelling above the peg embedded into new layer of clay -- attachment of a tube inside hole for peg by animal glue -- hole drilled through mountain for hanging wire in the back of the sculpture -- iron angle affixed to wooden element (3) above peg -- temporary fixation of the mountain by two bamboo poles and strings around mountain at different levels - re-attachment of the figure: -- peg pulled back into mountain S 23 from the back -- rope tied around figure to secure it during re-attachment -- hanging wire threaded through hole in S 23 -- back of figure coated with clay + hemp fibres + sand -- fracture surface inside S 23 coated with same mixture -- figure pulled upwards on rope and brought into right position -- peg pushed in as far as possible from behind -- temporary fixation rope fastened at the outside of the wall -- pipe clamp fastened around S 23, thick blotting paper put under the metal to protect mountain surface; cracks and missing parts in the modelling of the back of S 23 filled with clay mixture by injection; hanging wire attached to pipe clamp and wooden element (3). Tensioning device: turnbuckle with hook and eye (fixation no. 17) -- wire from back fastened to beam (3) by turnbuckle with hook and eye (fixation no. 18) -- peg affixed to iron angle: between iron angle and tip of peg there is a wooden wedge; next to the mountain S 23 there is a pipe clamp around the peg. The peg is thus affixed in inclined position (pointing upwards towards the figure and down at the tip). - 24 hours later: -- injection of clay with pumice through tube into peg hole (hole is filled) > tube removed -- bamboo poles removed behind mountain S 23 - 4 days later: -- removal of ropes for temporary fixation -- filling of remaining gaps between figure and mountain Remark: Losses in the modelling on the back of the mountains were filled with clay + straw. There was no time to check the fragments of the original modelling found behind the mountains for parts that may have belonged there. Besides, using fragments would have decreased the mechanical stability.	- hanging wire at the back of the shoulders: fixation no. 17 (1.0 mm): wire inserted with wooden pin into back of monk; tensioning device: turnbuckle with hook and eye attached to thick screw in beam 3 - hanging wire attached to pipe clamp at the level of the figure's knees, fixation no. 18: pipe clamp with metal sheet padded with blotting paper around back of S 23, turnbuckle with hook and eye attached to thick screw into beam 3	- broken ankles (both feet) glued - gap between right foot and cloud filled with mixture of clay + hemp fibres + sand - gluing of broken tip of cloak behind left sleeve (glued again after mounting figure onto wall) - knot of *kashaya* got detached during re-attachment of figure and was glued	

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done after 2011*
EN 4.8	no intervention in 2011			option: - removal from mountain; - removal of completion - remodelling of missing legs in fitting length and design
EN 4.23			- head glued to neck > original position cannot be restored because deformed mountain presses the head sideward - tip of mountain next to his (lost) feet glued	
GN 7.19a	- loose figure shifted slightly to move it closer to the mountain next to his right sleeve: therefore removal of some loose clay fragments between mountain and figure - wooden wedge inserted as temporary support below the feet to keep figure in the right position - clay mixture injected underneath the feet			
GN 7.19b and S 29	*standing loosely in a wrong position on ledge next to 7.19b:* - detached from mountain S 29 next to his left foot - figure taken down - brought back into right position with right shoulder	- after reinserting the figure has been and attaching it by a threaded bar: mountain S 29 affixed to beam (3) with hanging wire (fixation no. 16), thereby pulling it backwards towards the east wall	- left hand affixed inside the sleeve - left tip of cloak reconnected	
	underneath terrace, moving GN 7.19a slightly until best position was found for both figures - threaded bar, diameter 10 mm, inserted into peg hole because existing peg is too long and too thick to be inserted while the figure is in the right position - wooden block inserted as support below left foot - bamboo stick inserted horizontally between figure and mountain S 23 to prevent figure from tilting sideward - base below feet created by applying clay + straw mixture onto broken mountain - working from outside: gap between mountain and lower pole filled; missing part of mountain remodelled at the figure's foot and towards its robe using Japanese paper as isolation layer on robe			
EN S 2 and S 3		wire from 1981–85 removed, no substitute		define missing element on top of S 2

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done after 2011*
EN S 4 and tree F 130	*tree F 130 found and assigned to S 4*: re-attachment: - bamboo stick on back of tree embedded in mixture of clay + hemp fibres + sand - hole drilled into mountain to insert bamboo stick > crack in mountain top opened - back of trunk and base of tree at the mountain surrounded with clay-hemp fibre mixture - crack in mountain filled		- tree trunk was broken three times below foliage (treetop), once between levels of treetop: reconnected with clay suspension - stabilisation of broken tree trunk by bamboo stick on the back	
EN S 5	no intervention in 2011	hanging wire no. 14, galvanised turnbuckle		
EN S 6	no intervention in 2011			
EN S 7		hanging wire no. 11 inserted between S 7 and S 6, galvanised turnbuckle		- search for the missing tree
EN S 8	no intervention in 2011			
EN S 9	no intervention in 2011			- attempt to identify the missing object
EN S 10, tree on top			- broken tree trunk glued and stabilised	
EN S 11 and S 33	*remodelling from 1981–85 attaching S 11 to S 3, S 11 was loose*: - wire connection between S 11 and S 33 and around *laozi* cut and removed - removal of clay-straw filling behind S 11 overlapping onto S 33 - removal of filling from 1981–85 on the peg (below *piaodai*) - position of mountain and peg adjusted - temporary stabilisation by strings - mountains stabilised in improved position by injection of clay suspension - loss underneath peg of *piaodai* (hole around peg inside mountain) filled with clay + straw and clay + hemp fibres - small stabilising filling inserted between S 11 and S 33	- hanging wire around tip for stabilisation, fixation no. 12 - rope concealed with thin layer of clay		- option: to improve remodelling of tip
EN S 15	no intervention in 2011			- search for the missing tree
EN S 16	no intervention in 2011			- option: to improve remodelling of tip
EN S 17	no intervention in 2011			

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done after 2011*
EN S 18	no intervention in 2011			- attempt to find missing cloud and tree
EN S 19	no intervention in 2011			- option: to better remodelling
EN S 20	no intervention in 2011			
EN S 21	no intervention in 2011			
EN S 22	no intervention in 2011			
EN S 23 (*see also*: *EN 4.1, EN 4.7*)		- hanging wire at the back of EN 4.7 attached to wall, fixation no. 17 and 18 - hanging wire no. 3, attached to the lower pole, galvanised turnbuckle - hanging wire no. 1 around tip of mountain behind EN 4.1	- parts of broken mountain adjusted starting from the lowest one: -- EN 4.7 with mountain part: re-attached > *see above: EN 4.7* -- middle part stabilised by injection with clay-pumice mixture; gap to lower part filled with clay-pumice mixture; surface closed with clay + hemp fibres for fine-modelling -- top parts adjusted and stabilised > *see above: EN 4.1* - gap between middle part and mountain behind EN 4.1 still open due to the bulging of the reed bundle - missing parts of modelling on the back replaced with a clay-straw mixture	
EN S 29 (*also see: GN 7.19b*)	- position in front of lower pole adjusted	- hanging wire around mountain, fixation no. 16	- broken top stabilised by injection of clay suspension - loss on top surface filled - lost part of modelling on the back filled with clay +straw mixture	
EN S 30			- injection of clay + pumice into crack to fill crack and stabilise mountain	- to check if further stabilisation is necessary
EN S 32 and EN S 1			- removal of plaster behind mountains (from 1981–85, contains hair) - disarranged parts of mountains cannot be brought back to their original position	
EN S 33	- position corrected together with S 11		- mountain stabilised and crack filled by injection	
EN Y 5	no intervention in 2011		- two breaks in the tail glued	- to align and reconnect broken parts of tail (broken twice)
EN Y 6			- two breaks in the tail glued	
EN Y 7	- two nails from 1981–85 removed, two parts of cloud taken down		- broken parts assembled joined, and stored	- search for the original position

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done after 2011*
EN 4. A canopy	stable		- five arms: -- wire reshaped to regain original position -- gap between arm and canopy ring: filled with clay suspension - flower applications on the northern and southern arms: wire reshaped so that flower is pointing upward - bead chain fragment detached by cutting unsafe hemp fibres - beads on remaining chain fragments affixed to wire (still fragile)	- intermediate arms are still a bit loose - bead chain fragment: probably replace wire; re-attachment
EN 4.A right *piaodai*	- filling between peg and S 11 removed - wire inside *piaodai* reshaped to make the holes in the *piaodai* fit to the two pegs - brass wire threaded through the hemp string inside the peg hole - wire attached to peg - wire covered with clay filling - tip of peg and back of *piaodai* wire thickly coated with clay + hemp fibre mixture			- option: to complete missing part in the middle to increase stability
EN A.4 left *piaodai*	no intervention in 2011			- option: to remove completion from 1981–85, to insert fragments F 61, to make a new completion
T 1	- position stabilised by brass wire from tip to mountain behind, inserted into the mountain peak at the position of a lost tree			
T 2	no intervention in 2011			option: to remove wire from 1981–85 and to replace it by hanging wire or other device
upper pole (4)		- fixations no. 2, 6, 9, 11, 15 to fangmu		
lower pole (5)		- fixations no. 19, 20 to beam (3) at northern end - clamping band to beam (A) at southern end		
fangmu (2)		- connected to beam (1) from 1981–85 by clamping band at northern end to stabilise fangmu		

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done after 2011*
panel 10	- severed bracket panel removed from corner - panel 10 taken out - after end of work: - panel 10 connected by screws at break - panel 10 re-inserted - bracket panel inserted and affixed by screws			- to glue panel - to insert panel - to glue bracket panel next to SE corner

Figures and elements of the lower part of the wall

Number	*conservation of damaged parts*	*still to be done after 2011*
EN 4 *baoshen fo*	- right hand: thumb, index and middle finger reconnected and gaps filled - left hand: middle finger and little finger reconnected and gaps filled	- to check paint layer for overpaintings (hands are overpainted) - option: to remodel ring finger and little finger of left hand (existing completion of low quality)
EN 4 *baoshen fo,* pedestal		- to check through findings for fragments of decoration - to stabilise fragments of clay ornaments
EN 4.9	- *piaodai* around head: flattened ring bent back into right position; connection to cloud of EN 4.7 not possible because EN 4.7 is positioned too low now; loose parts reconnected to each other and to wire; missing parts reconstructed - fragment of *piaodai* below right arm: bent back into shape, parts re-attached to wire - fragment of *piaodai* at right hip: stabilised	- to stabilise fragments of hanging *piaodai* at the right hip - to stabilise the tip of *piaodai* at the left leg
EN 4.10	- three strands of hair bent back upwards into right position and glued to shock of hair - *piaodai* around head: wire bent upwards, but not into the right position yet - *piaodai* lying on the right arm: tip stabilised	- figure is loose: has to be stabilised !! - to check through findings for more strands of hair - to reshape and remodel *piaodai* around head to prevent further losses -to stabilise *piaodai* hanging down to the left and right - to stabilise *piaodai* lying on left arm - to stabilise halberd blade of weapon - to reshape and affix red *piaodai* fragments on chest
EN 4.11	- *piaodai* hanging from hip, left side: broken part stabilised with clay suspension - *piaodai* hanging from hip, right side: wire of tip reshaped partly (wire at risk of breaking); attached by two brass wire lops to the hook on the left foot of EN 4.10 where the *piaodai* originally was fixed	- *piaodai* around head: to reshape and stabilise fragments, to check through findings for more parts - several *piaodai* in front of belly: to reshape wires, to glue broken parts - *piaodai* shoulder to hip, right side: to reshape wires, glue broken parts, check through findings for missing parts, fill lost parts with clay - to exchange brass wire for steel wire or apply isolation coating (Paraloid) - note: paint layer / gilding on forearms is flaking

Number	*conservation of damaged parts*	*still to be done after 2011*
EN 4.12	- bent sleeve tip at left elbow: reshaped and reconnected to elbow > stabilised, but still flexible due to rigidity of wire inside - *piaodai* hanging from hip, left side: stabilised at tunic, re-attached to weapon shaft of EN 4.13 - *piaodai* shoulder to hip, left side: broken wire reshaped; held in shape by temporary fixation; wire ends connected at lower part of *piaodai* by Japanese paper; missing part over broken wire completed; fragments of *piaodai* re-attached to wire at the upper part, missing parts: fillings inserted to complete *piaodai*	- to check left elbow and maybe repeat stabilisation
EN 4.13	- right arm: stabilised at shoulder by injection of clay suspension - helmet, red bands, right and centre: wires reshaped, re-attached to helmet; central band: loose parts glued to wire, missing part completed - *piaodai* around head: temporary stabilisation by strings; broken parts reconnected to wire - *piaodai* shoulder to hip, left side: broken elements reconnected to wire - *piaodai* shoulder to hip, right side: remaining fragment stabilised - *piaodai* hanging from hip, right side: wire slightly reshaped, resulting in detachment of several small fragments of clay modelling: *piaodai* attached to tunic at iron wire loop; detached fragments re-attached; missing parts completed - *piaodai* hanging from hip, left side: wire reshaped, tip broke off. Upper part re-attached to body, no fillings; tip attached behind right foot of EN 4.14 in front of a ball of clay + hemp fibres + sand. Broken wire ends reconnected by Japanese paper; missing part completed with clay + hemp fibres + sand - *piaodai* ring in front of belly: broken parts re-attached to wire, stabilised - red *piaodai* loops above belt: wires reshaped into original position	- to find out origin of yellow on cloud ledge Y 3 between his feet - to find a way to re-attach broken right hand to wrist (the sculpture has sagged and tilted forward, the hand is displaced about 8 mm upwards and cannot be re-connected now) - to align and reconnect break at right elbow - to reshape broken parts of *piaodai*-ring in front of belly, to complete missing parts for stabilisation - fragment of *piaodai* around head (now stored as F 192): insertion in the middle according to photograph
EN 4.14	- *piaodai* around head: *hanging on temporary connections by strings; broken off when touched the first time* -- broken parts reconnected -- re-attached to both shoulders, contact area reinforced with clay + hemp fibre mixture - *piaodai* shoulder to hip, left side: -- wire reshaped into original shape -- reattached to hip and to *piaodai* hanging from the hip with clay + hemp fibre -- upper part of bow: fragments re-attached to wire; missing parts of upper part of bow completed - white *piaodai* ring in front of belly, between hip and knot (upper part): loose parts re-attached to wire; fillings inserted between fragments on the left side	- white *piaodai* ring in front of belly: to reshape lower part; to complete with fillings between fragments of modelling - crack around peg: -- grouting around peg -- to fill crack option: - to reshape ends of belt in front of chest

Number	*conservation of damaged parts*	*still to be done after 2011*
EN 4.15	no intervention in 2011	- *piaodai* around head: -- to reshape wire -- to search findings for missing parts -- to close ring around head -- to complete and fill lost modelling - *piaodai* hanging from belt, left side: -- to glue broken modelling - to reshape loop at belt and wires now sticking out in front of face
EN 4.16	no intervention in 2011	- to consolidate and affix *piaodai* hanging from hip, right side - *piaodai* hanging from hip left side: to reshape and stabilise kinked tip hanging down in front of clouds - *piaodai* around head: to reshape wire; if possible: to close the bow, search for missing parts among findings, complete missing parts - *piaodai* on the chest: to stabilise
EN 4.17	no damage visible	- to search findings for missing *piaodai*
EN 4.18	no intervention in 2011	- *fragments* of *piaodai*, hanging from hip, left side: to consolidate - search findings for fragments of *piaodai*
EN 4.19	- right index and middle finger stabilised by injection of clay suspension - two bent-down strands of hair: wire reshaped, clay modelling re-attached to wire, missing part of modelling in the middle completed - *piaodai* around head: detached part realigned, but not re-attached to figure - *piaodai* ring in front of belt: -- detached ring taken down -- broken ring stabilised -- ring reinserted with temporary fixation -- ring reconnected and stabilised with clay + hemp fibres from back of knot (i.e. starting point of ring) - *piaodai* shoulder to hip, right side: -- partly reshaped, lower end affixed by brass wire to hook at hip (original ending) -- loose parts re-attached to wire, stabilised - *piaodai* hanging from hip, right side: *found behind legs of figure, broken into two parts* -- the two parts reconnected and re-attached to wire -- reattached to original wire hook -- clay + hemp fibres added at hook to prevent the *piaodai* from swinging	- *piaodai* around head: upper part of ring still existing (F 109), but cannot be fitted in because of reduced distance between head and cloud ledge > finding a solution
EN 4.20	- right arm at elbow: -- reconnected by injection -- stabilised during drying by complicated temporary fixation	- *piaodai* around head: - upper part of ring still existing (F 110) but cannot be fitted in because of reduced distance between head and cloud ledge > finding a solution - to reconnect left arm at elbow - to reconnect broken sleeve tip to elbow of right arm; to fill gap at elbow - to stabilise "strap" sticking out from belt
EN 4.21		- to remove brick between wall and sculpture, to check stability of sculpture proposal for repair of dais: - to lift sculpture about 10 cm to original level of dais - to take out preserved parts of surface of dais; to build up dais from adobe bricks; to fit in original fragments

Number	*conservation of damaged parts*	*still to be done after 2011*
EN 4.22	- four small elements on top of crown: -- wire reshaped; elements stabilised at base with clay + hemp fibre; loose elements re-attached to wire - one loose wire on right side of crown: reinserted into original hole, stabilised by a filling at crown - left hand, broken at already repaired crack: -- clay suspension injected between hand and bamboo pole -- reconnected to wrist -- gap filled with clay + hemp fibres -- paper and filling material from previous repair was not removed	- fragment of bead chain on crown: --to restore bead chain, maybe replacement of wire -- reattachment to crown dais below EN 4.22 and position of figure: -- to remove repair plaster from surface of dais -- to check position of sculpture -- to correct position -- to fill / repair dais
cloud ledges Y 1 to Y 4	no intervention in 2011	option: - left side: to remove plaster from 1981-85 to reveal traces of the cloud stems on south and north edge of wall
wall behind EN 4.20	- hole between left tip of tunic and stem of cloud ledge, near southern corner of wall and hole (next to left foot) from lost *piaodai*: -- loose sand, wasps' nest and other debris removed as far as possible -- grouting with clay + pumice started above sleeve tip -- grouting continued at hole next to foot - hole next to sleeve tip filled with clay + straw-mixture - plaster from 1981–85 removed from cloud stem (traces remaining on polychromy)	- to finish grouting - to close hole next to foot at the level of straw-clay plaster (*cu ni*) - to fill the gap behind fragment of cloud stem (now loose)
wall behind EN 4.22	no intervention in 2011	- grouting of detached plaster layers and voids along the cracks behind the figure
dais	no intervention in 2011	- decision on damage to dais: to remove bricks ? possible way to repair the top of the dais ?

TREATMENTS CARRIED OUT IN 2012

I. Figures and elements of the mountain scenery

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done*
EN 4.1 monk + tip of S 23			- left arm stabilised	
EN 4.2 *kongzi* and EN S 28		- bamboo slip inserted underneath the hanging wire on the mountain behind his left arm		
EN 4.3 *shijia-mouni*			- F 259, the tip of a cloud from 1981-85 was re-attached	- understanding of the situation behind the figure - option (if possible): reconstruction of the background according to original one, including original fragments - if possible: re-attach clouds in their original positions
EN 4.4 *laozi* and EN S 6			- stem of mushroom in the right hand stabilized - tip of cloud behind his head stabilised	
EN 4.5 *feitian* and mountains S 18, S 26	- iron pin, 8 x 8 mm, made by local blacksmith, coated with Paraloid B 48 N - feitian attached to iron pin with steel wire loop behind the back - hole in the back of feitian filled with clay with hemp fibres + poraver 0.1-0.3 mm, 3:1 (volume parts), second application: ratio of 3: 2	- thin hanging wire wrapped in Japanese paper around the belly; threaded through mountain next to the iron pin and attached to *fangmu* with steel turnbuckle	- head, hand, piaodai around head stabilised again - detached element identified as bent feather: straightened, re-attached to right wing - hole in the mountain closed with clay-straw mixture	
EN 4.6 *feitian*, mountain S 9				
EN 4.7, mountain S 23				
EN 4.8	no intervention in 2012			option: - removal from mountain; - removal of completion - remodelling of missing legs in fitting length and design

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done*
EN 4.23	- tree F 96 attached near the feet of the corpse			
GN 7.19a	-			
GN 7.19b and S 29				
EN S 2 and S 3				define missing element on top of S 2
EN S 4, tree F 130				
EN S 5		hanging wire no. 14: galvanised turnbuckle exchanged against stainless steel turnbuckle		
EN S 6				
EN S 7		hanging wire no. 11: galvanised turnbuckle exchanged against stainless steel turnbuckle		- search for the missing tree
EN S 8				
EN S 9				- attempt to identify the missing object
EN S 10, tree on top				
EN S 11 and S 33				- option: to improve remodelling of tip
EN S 15				- search for the missing tree
EN S 16				- option: to improve remodelling of tip
EN S 17				
EN S 18				- attempt to find missing cloud and tree
EN S 19				- option: to better remodelling
EN S 20				
EN S 21				
EN S 22				
EN S 23 (*see also*: *EN 4.1, EN 4.7*)		hanging wire no. 3: galvanised turnbuckle exchanged against stainless steel turnbuckle		
EN S 29				
EN S 30			- stability checked, no treatment necessary	
EN S 32 and EN S 1				
EN S 33	- position corrected together with S 11			
EN Y 5	no intervention in 2011		- two breaks in the tail glued	
EN Y 6				
EN Y 7				- search for the original position

Number	*fixation of figure or part to the wall*	*steel hanging wires*	*conservation of damaged parts*	*still to be done*
EN 4. A canopy	- beaded chain pendant F 194 re-attached after restoration to central arm - beaded chain pendant F 105 attached after restoration to right arm		- five arms: -- three arms in the center loose again: stabilised with fillings - tip of green cloud on the bottom side of the canopy stabilised - beads of fragmented pendant of central arm stabilised by gluing and filling	
EN 4.A right *piaodai*				- option: to complete missing part in the middle to increase stability
EN A.4 left *piaodai*				- option: to remove completion from 1981–85, to insert fragments F 61, to make a new completion
T 1	- break at the foot of the pagoda stabilised by injection of clay suspension	- brass wire exchanged against stainless steel wire		
T 2				option: to remove wire from 1981–85 and to replace it by hanging wire or other device
panel 10			- panel and bracket remain connected with screws (stable)	- to glue panel - to insert panel - to glue bracket panel next to SE corner

Figures and elements of the lower part of the wall

Number	*conservation of damaged parts*	*still to be done*
EN 4 *baoshen fo*	- F 50, curl from above the left temple, re-attached to the original place	- to check extent of overpaintings (hands, …) - option: to remodel ring finger and little finger of left hand (existing completion of low quality)
EN 4 pedestal		- to check findings for fragments of decoration - to stabilise fragments of clay ornaments
EN 4.9	- right arm stabilised at elbow - tip of sleeve stabilised at right elbow - *piaodai* below right arm: straightened and adjusted; supportive filling at the joint to the body; wire at lower end connected to loop above the belt - the tip of *piaodai* at the left leg stabilised	
EN 4.10	- figure re-connected to wall: clay mixture with pumice powder injected around peg, hole around peg filled superficially with clay mixture with hemp fibres and pumice powder - left elbow re-attached to mountain behind - weapon: crescent blade of halberd, left side: wire loop around blade reshaped, blade stabilised with fillings; stainless steel wire inserted from behind to stabilise the preserved blade and its fragmented counterpart - left hand, wrist: re-attached to arm - *piaodai* around head: only broken wire preserved: broken part reinserted with supportive steel wire - strands of hair above left ear re-attached (were loose) - red *piaodai* in front of chest: supportive fillings inserted on both sides - *piaodai* below right arm: bent backwards to the original position; two small lost areas completed, larger missing parts not filled - *piaodai* below left arm: was still connected at the hip, but detached at the arm: re-bent into fitting shape; the protruding wire at the upper end inserted into hole in the figure below *piaodai* at the chest - loop at the belt, left side: was loose, re-attached - *piaodai* at hip, left side: two small supportive fillings - *piaodai* at hip, right side: lower end attached to wire loop at the leg of EN 4.9: the wire was loose and out of shape: finding the fitting position, After the *piaodai* was attached. Large loss towards the hip supported with stainless steel wire on the backside and supportive filling; lower preserved part: filling at the upper end and at the side to include and fixate wire	- to check through findings for more strands of hair
EN 4.11	- *piaodai* below left arm: bent back to correct shape, supportive fillings at the ends of the clay modelling - *piaodai* below right arm: wire bent back into the right position, clay modelling: brak edges stabilised - *piaodai* at hip, left side: supportive filling in the middle of the *piaodai* - *piaodai* at hip, right side: supportive fillings at the upper end, stabilisation of break edges; at the lower end: brass exchanged against stainless steel wire attached behind the *piaodai*. Wire connected directly to the foot of EN 4.11. - loose wire loop at the leg EN 4.11 stabilised before attaching the wire of the *piaodai*. - red band at the animal head on the belly: break edges on the right side stabilised - tie above the animal head bent back to original shape - *piaodai* around head: F 207 (two fragments) inserted	

Number	*conservation of damaged parts*	*still to be done*
EN 4.12	- Crossguard of the sword (from F 184-1) re-attached - *piaodai* underneath left arm glued and filled in 2011 was loose again: re-attached again, rework filling; lower part: stabilised, upper part: supportive filling inserted	
EN 4.13	- *piaodai* around head: fragment F 192 inserted and missing parts completed - headgear decoration: supportive filling at the raised red bands: left side front and back, right side, front; right side, back in the centre - *piaodai* below chin: three supportive fillings inserted - right arm: glued/stabilised at the shoulder, the elbow and above elbow (gluing of 2011 was broken again) - left arm: glued at the elbow - ring of *piaodai* in front of belly: supportive filling inserted to close ring - *piaodai* hanging from left hip: glued again and stabilised with more and better fitting supportive fillings	- to find out origin of yellow on cloud ledge Y 3 between his feet
EN 4.14	- *piaodai* around head: fragment inserted and supportive fillings inserted - band on the chest: on the right one supportive fillings inserted - *piaodai* below left arm: stabilised, fillings - white *piaodai* ring in front of belly: supportive fillings and hanging end on the left side stabilised - left arm: cracks above and below elbow stabilised by injecting clay suspension	- crack around peg: -- grouting around peg -- to fill crack
EN 4.15	- headgear: S-shaped decoration element from F 52 attached - hairpin bent back into the right shape - curled wire on top of the headgear re-attached - element connected to lance: modelling stabilised, at the edge supportive filling - right hand: re-attached to wrist - belt: at the left side rosette decoration F 13 attached - *piaodai* hanging from belt, left side: modelling glued - loop at belt reshaped; wires which were sticking out in front of face reshaped	- *piaodai* around head: -- to reshape wire -- to search findings for missing parts -- to close ring around head -- to complete and fill lost modelling
EN 4.16	- *piaodai* around head: preserved fragments at the shoulders bent back into the right position; two fragments F 60c and F 145 assembled and inserted; support wire (stainless steel) attached from behind; at the left side, lower side supportive filling; at the right side losses completed; at the shoulders re-attached and in the middle attached to cloud behind the head of the figure at a place which was not painted, but showed traces of the green paint of the *piaodai* - headgear, hairpin: end with bead bent back into shape and small supportive filling - ball at the end of the weapon in the left hand: ball attached to shaft of weapon - *piaodai* below left arm: fragment from F 34 re-attached - loop at belt, left side: reshaped and re-attached - *piaodai* at hip, left side: tip bent back into shape, supportive wire (stainless steel) attached on the backside; supportive fillings in the modelling - *piaodai* at hip, right side: break along wire: stabilised, supportive filling - green band at the chest, left side: small supportive filling for stabilisation	

Number	*conservation of damaged parts*	*still to be done*
EN 4.17	- F 157 d, strand of hair, attached above right temple	- to search findings for missing *piaodai*
EN 4.18	- *piaodai* around head: broken part adjusted (bent upwards), stabilised by adding supportive wire - *piaodai* loop at belt, left side: F 22 attached - fragmented *piaodai* at the left hip stabilised	- search findings for fragments of *piaodai*
EN 4.19	- strands of hair: supportive fillings - fingers of right hand: glued again (gluing of 2011 was not sufficient) - *piaodai* below right arm: stabilised and supportive fillings; brass hook exchanged against stainless steel hook which was coated with Paraloid B 48 N - small black loop on the chest: stabilised and fillings - loop above belt, left side: stabilised and fillings	- *piaodai* around head: upper part of ring still existing (F 109), but could not be inserted because of reduced distance between head and cloud ledge
EN 4.20	- breaks at the right elbow: both open and loose: stabilised - sleeve tip at elbow of right arm: break filled - breaks at left arm above elbow: stabilised - "strap" sticking out from belt: stabilised - *piaodai* around head: F 110: inserted - *piaodai* below right arm: F 182: supported with wire at the lower end; broken ends connected with Japanese paper coated with Paraloid B 48 N; only the wire is touching the figure	
EN 4.21	- figure lifted to rebuilt dais: -- figure lifted with pulley -- dais rebuilt -- decayed end of pole inside the figure cut off and prolonged with new pole and four threaded bars -- figure re-inserted -- new plaster layer - crack at the neck filled - both hands stabilised at the wrists, crack filled - parts of red band (*yingluo*) added at the shoulders: on the right side: F 257; at the left side F 103 - greyish blue *yingluo*(originally green?), left side, loop stabilised - red flame on the right side of the crown: reshaped - rosette F 122 attached to crown - red decorative elements F 24, F 26 attached to crown - F121-1, wire spiral attached to right side of the crown	
EN 4.22	- left hand stabilised at wrist again - crack in the neck filled - crown: flame-shaped element F 215 attached - central flame shaped element re-attached - rosette F 54 attached to crown - beaded chain element F 195 restored and re-attached	dais below EN 4.22 and position of figure: -- to remove repair plaster from surface of dais -- to check position of sculpture -- to correct position -- to fill / repair dais
cloud ledges Y 1 to Y 4		option: - left side: to remove plaster from 1981-85 to reveal traces of the cloud stems on south and north edge of wall
wall behind EN 4.20	- grouting finished and hole next to foot filled with clay + straw-mixture - gap behind cloud stem filled	
wall behind EN 4.22	- grouting of detached plaster layers and voids along the cracks behind the figure	
dais		- decision on damage to dais: to remove bricks ?, possible ways to repair the top of the dais ?

Mapping of damage and treatment

The mapping of damages and treatments was carried out by Stefan Demeter and Maximilian Knidlberger using the software *metigo map*.
Gao Yan proposed to use a legend that was based on the legend developed by the Shaanxi Institute for Conservation based on a Chinese standard legend for wall paintings. This standard uses black-and-white patterns which can only be clearly seen when used on a drawing, not a photograph. As a sufficiently exact drawing of the wall could not be made during the work on-site, and it was not possible to import all the patterns used in the Chinese legend into *metigo map*, patterns and colours of the legend were taken from the standards of the *metigo* map system. For the future it should be planned how to develop and technically realise a mapping system that can be used by Chinese and German.
Another problem is that the figures and the wall overlap in photographs and drawings and it is difficult to show clearly which layer the sketched-in damage or treatment is located. Especially where treatments were carried out on the wall and different levels of the figural decoration, as e. g. on the *shijiamouni* EN 4.3, the *feitian* EN 4.5 or the monks EN 4.1 and 4.7, the mapping gets confusing due to overlying structures. This problem could also still not be solved completely.

In the following the damage, as recorded in 2011 and the treatments of 2011 and 2012 are shown. For the area of the mountains with the hanging wires and the figures of the *tianwang* and the *feitian*, mappings were made on photographs showing these figures more in detail.

Legend

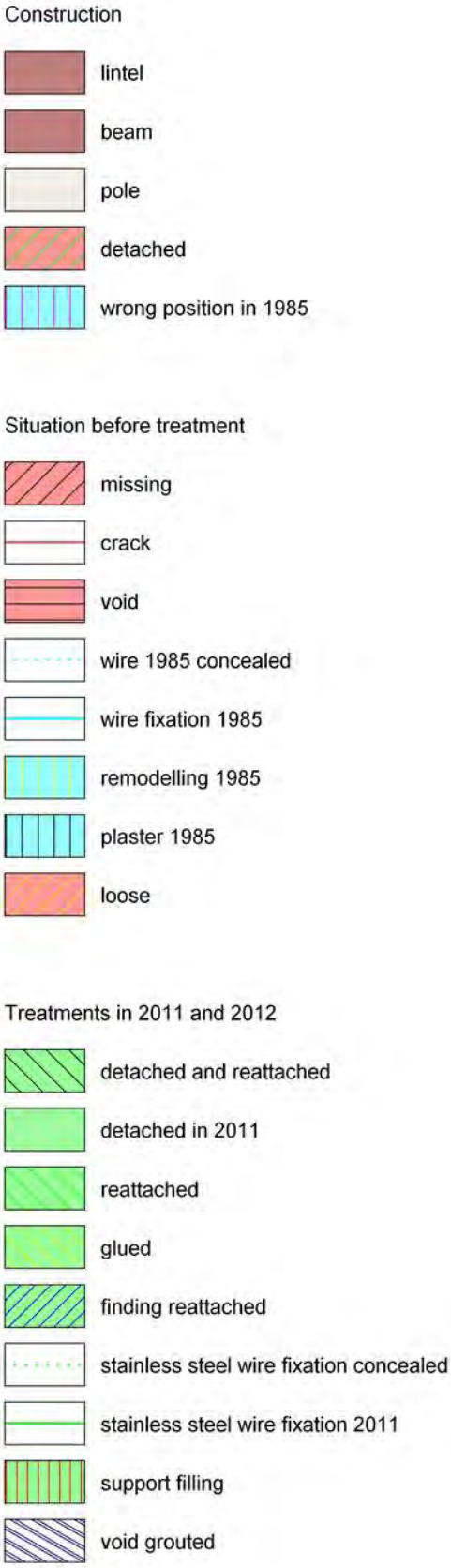
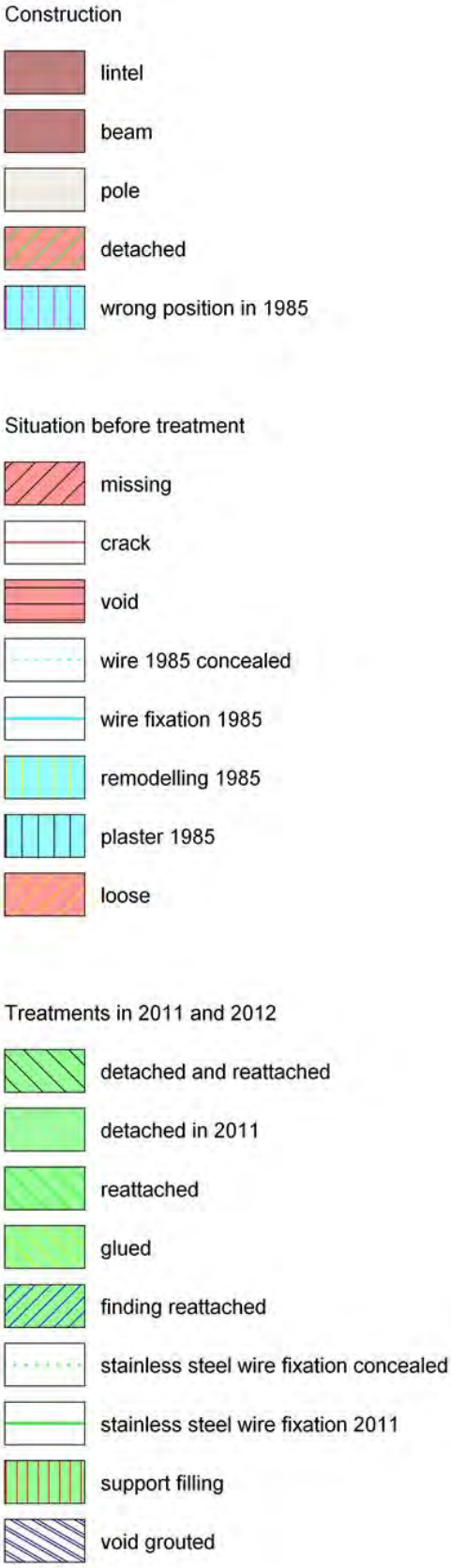

Construction
lintel
beam
pole
detached
wrong position in 1985
Situation before treatment
missing
crack
void
wire 1985 concealed
wire fixation 1985
remodelling 1985
plaster 1985
loose
Treatments in 2011 and 2012
detached and reattached
detached in 2011
reattached
glued
finding reattached
stainless steel wire fixation concealed
stainless steel wire fixation 2011
support filling
void grouted

Fig. 286
Previous repairs and situation of damage (2011)

Legend


Construction
lintel
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wrong position in 1985
Situation before treatment
missing
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wire 1985 concealed
wire fixation 1985
remodelling 1985
plaster 1985
loose
Treatments in 2011 and 2012
detached and reattached
detached in 2011
reattached
glued
finding reattached
stainless steel wire fixation concealed
stainless steel wire fixation 2011
support filling
void grouted

Fig. 287
Conservation treatments in 2011 and 2012

Legend

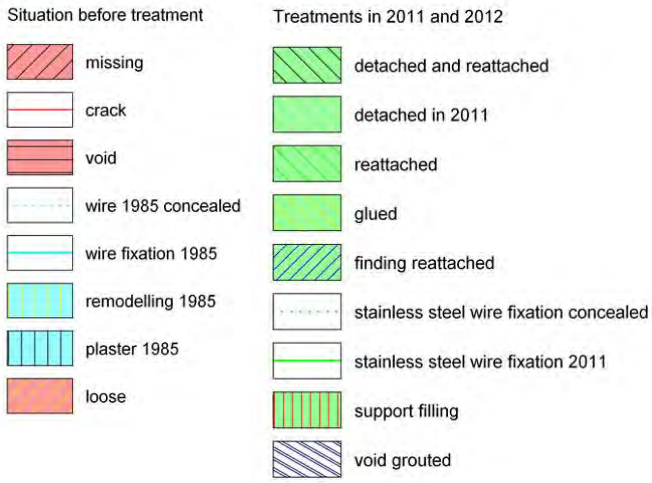

Fig. 288
Conservation treatments in 2011 and 2012- *tianwang* northern side

Fig. 289
Position of steel hanging wires inserted in 2011 (green), poles (white) and beams (brown) behind the mountain scenery

Fig. 290
Conservation treatments in 2011 and 2012- *tianwang* northern side

Legend

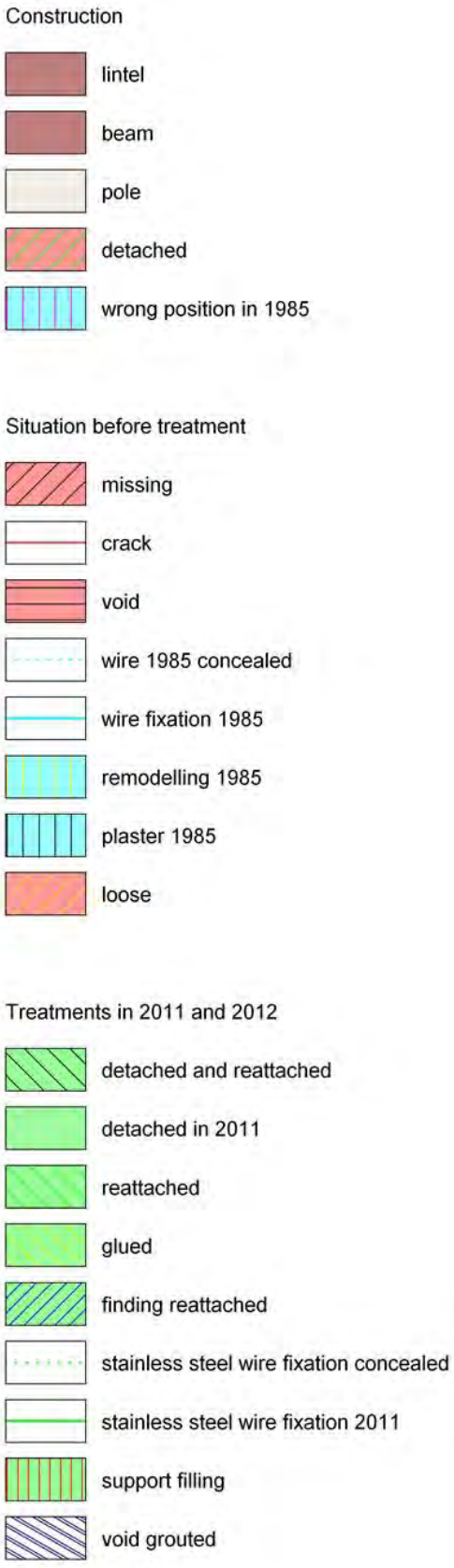
Construction
lintel
beam
pole
detached
wrong position in 1985
Situation before treatment
missing
crack
void
wire 1985 concealed
wire fixation 1985
remodelling 1985
plaster 1985
loose
Treatments in 2011 and 2012
detached and reattached
detached in 2011
reattached
glued
finding reattached
stainless steel wire fixation concealed
stainless steel wire fixation 2011
support filling
void grouted

Fig. 291
Feitian EN 4.5, situation of damage

Fig. 292
Feitian EN 4.5, conservation treatment in 2011

Legend

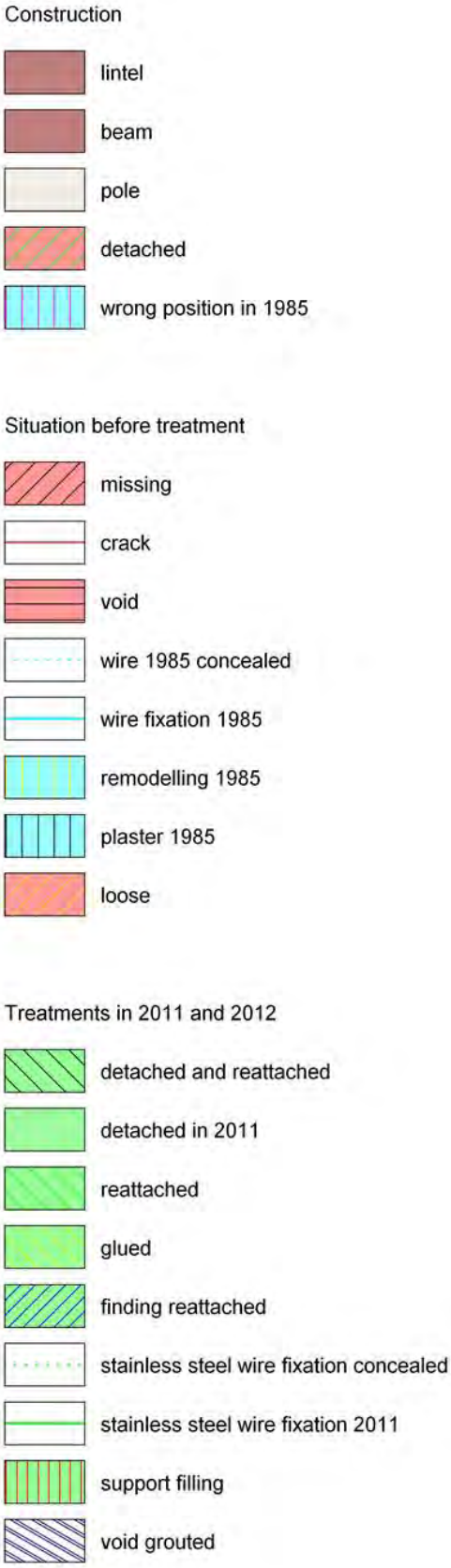
Construction
lintel
beam
pole
detached
wrong position in 1985
Situation before treatment
missing
crack
void
wire 1985 concealed
wire fixation 1985
remodelling 1985
plaster 1985
loose
Treatments in 2011 and 2012
detached and reattached
detached in 2011
reattached
glued
finding reattached
stainless steel wire fixation concealed
stainless steel wire fixation 2011
support filling
void grouted

Fig. 293
Feitian EN 4.6, situation of damage

Fig. 294
Feitian EN 4.6, conservation treatment in 2011

Fig. 295
Corpse in a cave of the mountains EN 4.23, situation after conservation in Nov. 2011

Fig. 296
Cave with corpse EN 4.23 after re-attaching tree F 96 found in the debris behind *pusa* EN 4.21

FINDINGS

All fragments were dusted off with soft paint brushes (fig. 297), photographed (fig. 298) and numbered. Several fragments which were found broken into pieces were reassembled (table 14, fig. 299). At the end of the work visits, the fragments were packed in polystyrene and polyethylene boxes[23] and stored in cardboard boxes (fig. 300).
In 2012, all fragments were unpacked and sorted according to shape and colour. It was possible to reconnect small fragments to form larger parts, especially from the numerous fragments of *piaodai*. 19 fragments could be re-attached to their original places (fig. 304, 305). The original place of small, mould-made elements cannot be distinguished without doubt. However, eight small findings were attached to places where they may have been and fitted well, however. Clouds which were identical in shape but differed in colour, and other larger elements were not re-attached as their position could not be identified beyond doubt. There is a chance that the photographs taken in the *minguo* period (1912-1949) or in the 1970's and 1980's may show some of the loose elements at their original places.[24] Therefore it was decided to store them until more information about the Shuilu'an can be compiled and evaluated.
The list of findings can be found in the appendix of this report (p. 209-246).

Numerous parts which had got detached from the wall were found on and near the wall, mainly
- behind and below pusa *EN* 4.21
- behind the mountains
- on the cloud ledges
- on the dais and the pedestal of the *baoshen fo*

The pedestal and the dais had been used discretely to store loose parts, including larger fragments such as parts of clouds and a tree. Most findings came from the area around *pusa* EN 4.21. The top of the dais had collapsed and sunken around the figure before 1981, and probably it had been repaired at least once before 1981. In 1981-85, the area had been covered with a thick layer of mud straw plaster containing lime, and a thinner plaster with lime and hair to raise it to the level of the rest of the dais. The filling measured at least 7 cm (mainly more). The new plaster covered numerous smaller and larger elements that had fallen down in this area and had not been removed. In 2011, they were found embedded in a layer of dust, debris of the dais, traces of worship as bamboo slips for prayer and incense sticks, and traces of the workers from 1981-85, for instance gnawed off corn cobs and sunflower seed shells.
Altogether about 500 bigger and smaller pieces were retrieved and catalogued in 2011 with 195 entries using the identification code F (finding, fragment). In 2012, about 390 additional fragments, most of them of smaller size, were catalogued, mainly in groups, with 65 entries. Repeatedly groups of up to 77 similar fragments were listed as one entry. The findings comprise: several clouds; leaves and fruits or blossoms from figures holding twigs; gilded rosettes; many parts of flying bands (*piaodai*) in red and green; decoration of headgears; fragments of the decoration of the pedestal of the *baoshen fo*; many beads and some ornaments from bead chain decorations either from the *baoshen fo* or from *pusa* EN 4.21, maybe even *pusa* EN 4.22. Two feathers of *feitian* 4.5 could be identified.

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[23] The polystyrene boxes were bought in Germany. Additional polyethylene boxes were bought in China.

[24] According to the former director Fan Weiyue, photographs were taken in the *minguo* period by Americans or now stored in an American archive, and before and after the renovation of 1981-85. *Also see: Meeting with Mr. Tian and with Mr. Fan, Aug. 23 and 28, 2012*, p. 257-258.

Table 14
Findings: Conservation treatments and re-attached parts

2011

Number	*conservation of broken parts*	*re-attached to wall*
F 1 dragon head, gilded, glass eye	- broken into two parts: parts reconnected to prevent further damage; iron wire not isolated	
F 2 red and white cloud	- broken into two parts: reconnected; glued again in 2012	
F 3 pink cloud	- broken parts reconnected: hard clay does not take up water, difficult to glue; glued again in 2012	
F 4 cloud	- broken parts reconnected	
F 15 rosette with wire core	- reconnected	
F 19 green *piaodai*	- broken into two parts: reconnected	
two fragments from F 6 and F 35	- aligned and joined	
F 54 rosette-shaped element	- reconnected (had a wire inside)	- attached to crown of *pusa* EN 4.22 in 2012
F 93 tree	- broken trunk reconnected with clay suspension (two cracks)	
F 97 cloud	- broken parts aligned and reconnected	
F 130 tree	- broken trunk reconnected - bamboo stick attached on back of trunk	- re-attached on S 4
F 135 gilded feather		- re-attached to wing of *feitian* EN 4.5

2012

Number	*conservation of broken parts*	*re-attached to wall*
F 6a and parts of F 35 red and white *piaodai*	- F 6a aligned with four part from F 35and reconnected to form a larger fragment	
F 13 rosette, gilded, d. 2.5 cm		-attached to belt of EN 4.15
F 19 and part from F 70 green *piaodai*	- parts were aligned and reconnected to form a larger fragment	
from F 19, from F 40, from F 205 green *piaodai*	- the three parts were aligned and reconnected to form a larger fragment	
F 22 strap of belt, no gilding		- attached to right hip of EN 4.18
F 24 decoration of headgear, red		- attached to crown of pusa EN 4.21
F 26 decoration of headgear, red		- attached to crown of pusa EN 4.21
F 28 gilded feather		- attached to *feitian* EN 4.5 at the right wing
from F 34 green *piaodai*, large fragment		- larger part re-attached to EN 4.16, below his left arm
from F 34 green *piaodai*, smaller fragments	- fragment connected to part from F 205 - fragment connected to part from F 205 and F 154	
from F 37 green *piaodai*	- two fragments aligned and reconnected to form a larger fragment *- F 37-1 ③: see F 60b*	
F 50 curl of Buddha's hair		- re-attached above left temple of *baoshen fo* (fig. 305, 306)
F 52 S-shaped element, gilded		- attached to headgear of EN 4.15
F 60a and F 145 green piaodai	- the two fragments were re-connected when they were inserted at the *tianwang* to be re-attached	- re-attached to EN 4.16: piaodai around head, left part

Number	*conservation of broken parts*	*re-attached to wall*
F 60b green *piaodai*	- connected to F 216 and F 37-1 ③	
F 60c green *piaodai*	- connected to F 145	- re-attached to EN 4.16: above the head, right part
F 67 (3 parts) and parts from F 154 green *piaodai*	- parts aligned and reconnected to form a larger fragment	
F 96 tree	- stabilised	-re-attached at the feet of the corpse EN 4.23
F 100 green *piaodai*	- the three fragments were reconnected	
F 103 red *piaodai*		- re-attached to left shoulder of EN 4.21
F 105 beaded chain pendant	- stabilised	- attached to southern arm of canopy
F 110 green *piaodai*		- re-attached to *piaodai* around the head of EN 4.20
F 121-1 wire spiral		- attached to the corn of *pusa* EN 4.21, on his right side
from F 122-1 small rosette, gilded, d. 1.6 cm		- attached to crown of *pusa* EN 4.21
F 145 part of green *piaodai*	*see F 60a*	
F 146 and part from F 154 *piaodai* with grey underpainting	- two parts of F 146 re-aligned - re-attached to part from F 154	
parts from F 154 green *piaodai*	- two parts connected to each other - some parts connected to F 67 - one part connected to part from F 34 and F 205 - *part connected to F 146: see above*	
F 157 d strand of hair		- attached to EN 4.17 above his left temple
F 165 decoration of helmet		- re-attached to helmet of EN 4.13, back
F 182 green *piaodai*		- re-attached to EN 4.20, below his right arm
F 184-1 cross-guard of sword		- re-attached to EN 4.12
F 194 beaded chain pendant	- wire of transverse chain exchanged - conservation, stabilisation	- re-attached to middle arm of canopy
F 195 beaded chain pendant (fragment)		-re-attached to crown of *pusa* EN 4.22
F 197 decoration, gilded (from *jingang*?)	- nine fragments reconnected and stabilised from the back	
F 207 green *piaodai*	- three parts reconnected to form a larger fragment	- re-attached to *piaodai* around the head of EN 4.11
F 205 green *piaodai*	- *one fragment attached to part from F 34 (see above)* - *one fragment attached to parts from F 19 and F 40* - four fragment aligned to form a larger fragment	
F 207 green *piaodai* with partial gilding	- the two parts were reconnected	- re-attached to *piaodai* around the head of EN 4.11
F 216 green *piaodai*	- see F 60b	
parts from F 217 green *piaodai*		- two parts re-attached to right shoulder of EN 4.11
F 257 red *piaodai*		- re-attached to right shoulder of *pusa* EN 4.21
F 258 green *piaodai*	- the six parts were reconnected	
F 259 tip of cloud from 1981-85		- re-attached to cloud below *shijiamouni* EN 4.3

Fig. 297
Nov. 2011: Liang Qing and Wang Yang dusting fragments and classifying them into groups.
Because of lack of space, tables and lighting, the work was done in the courtyard.

Fig. 298
Wang Yang photographing fragments with their number and centimetre scale

Fig. 299
Gao Yan and Liang Qing reconnecting broken fragments

Fig. 300
Cataloguing and packing the fragments in the courtyard in Nov. 2011

Fig. 301
Sieving sand from the debris below the pusa EN 4.21 and cleaning the fragments found in the debris, Aug. 2012

Fig. 302
Fragments from 2011 unpacked to try to realign them to larger units and to reconnect them to the wall

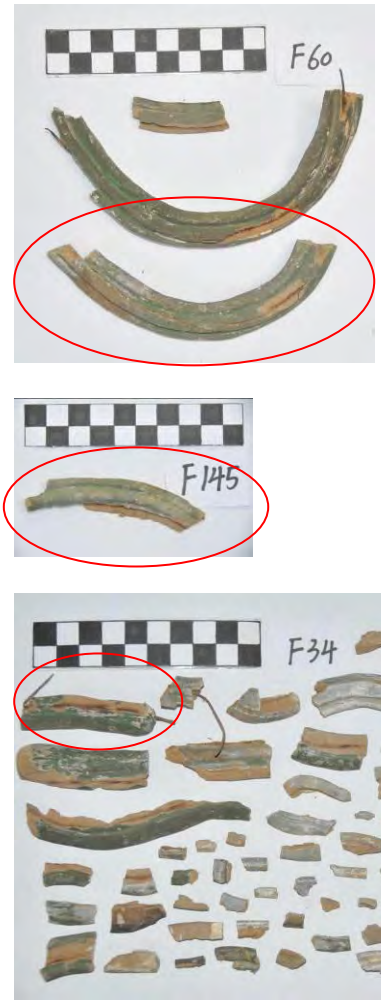


Fig. 303
Findings F 60, F 145 and F 34. Three fragments (marked red) could be assigned to the *piaodai* of *tianwang* EN 4.16

Fig. 304
Tianwang EN 4.16 after re-attaching findings F 60 c, F 145 and a fragment from F 34 (accidentally labelled as F 28) of the *piaodai* identified among the findings

Fig. 305
Baoshen fo, hair above left temple

Fig. 306
Baoshen fo, after re-attaching curl F 50

TESTS FOR THE IMPROVEMENT OF CLAY MIXTURES 2012

The tests made accompanying the conservation of the EN wall had the aim to test other organic and inorganic additives than used before for the clay mixtures used for grouting and gluing loose or broken parts. The tests focussed on two questions:
- effect of animal glue (*ming jiao* and gelatin) in comparison to Tylose MH 300.
- effect of pumice powder compared to glass microballoons
- effect of pre-moistening (priming) with diluted organic additives.

Two series of tests were made, both on-site with rather primitive methods and possibilities of evaluation: Clay mixtures were poured into plastic rings (diameter 5 cm) using a historical adobe brick as support; fragments of adobe bricks were glued to the complete adobe brick or to other small fragments.

Materials

Clay
The clay was the so-called *black earth* (brown in colour) taken from the mountain next to the Shuilu'an. The clay was dried, crushed and sieved (mesh size 0.2 mm).

Adobe bricks
The adobe bricks used as support and, in the shape of fragments, as small specimen, were taken from an old farmhouse in the village adjacent to the Shuilu'an. The old farmhouse was demolished in 2011 and was at least 100 years old.

Water
For large amounts of clay mixtures tap water from the temple was used. Coming from the mountain (or a well at the temple area) it is not chlorinated and visually contains no calcite.[25] An analysis to determine the water quality was not made.
For small amounts, as in the case of the tests, drinking water sold in bottles was used. There was no obvious difference depending on the water quality, but further evaluations were not carried out.

Micro-balloons
The used micro-balloons were Scothclite™ K1, made of soda lime borosilicate glass, with an average grain size of 46 µm, the largest bubbles being of 200 µm.[26] Mixtures containing micro-balloons have to be stirred in gently to prevent crushing the glass spheres. As in the previous year more water had to be added compared to the recipe of the HFM 8 mixture[27] to achieve processible mixtures.

[25] XRD analysis of the surrounding soil resulted in a calcite content of less than 3 %, but the influence of the mountain rocks is unknown.

[26] According to data sheet provided by Kremer Pigmente.

[27] HFM 8 was a mixture designed in tests of 2008 and 2009 (*see Annual report 2007-2009, p. 23-28*), containing 4 parts of water, 6 parts of clay (black earth), 15 parts of micro-balloons and 2 parts of Tylose MH 300, 3% in water (all parts are volume parts)

Pumice powder
Pumice powder of different fineness was used.[28] The finest quality, 0-90 µm, was not available in 2012 anymore, so the rests were used up. The possibility to sieve the pumice powder in order to obtain finer fractions was not used, but may be tested in the future.

Gelatin
Gelatin is not available in China. Tests regarding the different types of gelatin were not made. The used gelatin is a so-called "technical gelatin" powder sold by Kremer Pigmente (slightly yellowish, pH 5.5-7).

Ming jiao
Ming jiao describes a lightly coloured quality of skin glue. The used material came from a laboratory equipment shop in Xi'an. It is a fine-grained granulate of lightly brown colour. Technical information was not available.

Tylose® MH 300
The product is a non-ionic, normally etherified methyl hydroxyl ethyl cellulose (indicated by the abbreviation MH) of a rather high viscosity of the gel (300 mPa•s). It is soluble in water.

Supplementary devices
The rings used to cast round specimen were made of petri dishes of 5 cm diameter consisting of transparent plastic (perspex or PS). To allow drying, the bottom was cut out, leaving the sides as a 1 cm high ring.

For all the tests, two specimens of the same mixture or type were made. Time and material resources did not allow to produce a greater number of specimens.

Test 1 and 2 - Comparison of gelatin and Tylose in a grouting mixture

Composition in volume parts (VP):

5 VP	clay (black earth)
5 VP	pumice powder 0-90µ
10 VP	micro-balloons
7 VP	adhesive solution (Tylose or gelatin in water)

Preparation of liquid part:

Tylose:		Gelatin:
5 VP	water	1% in water
2 VP	Tylose 3%	
= 0.86% Tylose		

(The difference of percentage of solid matter between Tylose and gelatin was not intended, but resulted from a mistake of calculation during the preparation which was detected too late)

Test 1: At first after preparation, the mixture with Tylose had a better flowability (fig. 307). Both mixtures swell after preparation because the clay takes up water over a rather long period. After 24 hours, both mixtures were so "stiff" that they could not be extruded using a syringe (even without cannula).

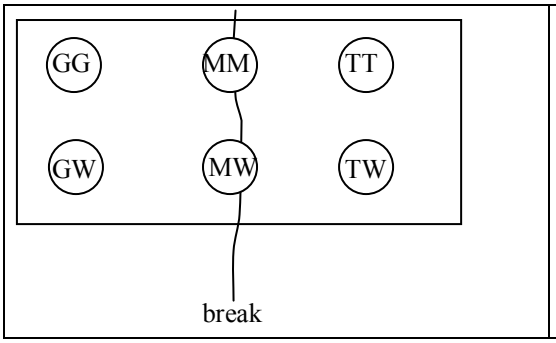
[28] Three types of pumice powder, Bimsmehl sehr fein 00, Bimsmehl sehr fein 0 and Bimsmehl 0-90µ were bought at the company Kremer Pigmente.

Fig. 307
Freshly prepared mixtures of test 1:containing gelatin (left side) and Tylose (right side)
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 308
Test mixtures of test 1 after application with syringe (without cannula)
[Gao Yan, Shaanxi Institute for Conservation]

Test 2 repeated test 1 in a slightly improved way: smaller cups were used for measuring and the content was controlled by weight (this revealed a certain impreciseness caused by the use of measuring cups, which becomes relevant when using small amounts).
The mixture containing Tylose showed a higher flowability. Besides the slight difference of solid content of the adhesive, the reason is the difference of gel formed by the two materials. The mixture with gelatin stiffened quickly and had to be used warm. Water had to be added to obtain an extrudable mixture. After application on the adobe brick, the water penetrated more quickly into the brick than in the case of the mixture with Tylose.

In addition *ming jiao* was included in this test. The brick was pre-moistened either with water or a 0.5% adhesive solution (animal glue / Tylose).



	adhesive	pre-moistening
GG	gelatin	gelatin, 0,5%
MM	*ming jiao*	*ming jiao*, 0,5 %
TT	Tylose	Tylose, 0,5 %
GW	gelatin	water
MW	*ming jiao*	water
TW	Tylose	water

Fig. 309
Scheme of test 2

Evaluation of test 1 and 2
- No specimen broke or developed cracks. The shrinkage was nearly the same at all specimens.
- The addition of gelatin and *ming jiao* adduced to the same hardness. All specimens except for one were rather soft. One was much harder. The reason is unclear.
- The addition of Tylose resulted in much harder specimens with a higher adhesion to the adobe brick.

- The animal glue went bad rather quickly in the prepared mixture, but also during the drying time of the specimens. After drying, the specimens were smelly (this happened in test no. 1). All smelly specimens remained very soft and could be crushed between two fingers.

Unfortunately the adobe brick broke when it had to be moved. Both specimen containing *ming jiao* (MM and MW) and one containing gelatin (GG) became detached from the brick. All of them mainly broke off at the brick surface or slightly inside the specimen. The remaining three specimens (GW, TT and TW) were pulled off from the adobe using two fingers. The observations are listed in table 15.

Table 15.
Observations on specimens of test 2

Specimen	*observation on consistency and adhesion to brick*
GG	specimen is hard, not smelly; not possible to crush with the fingers, broke off at the surface of the adobe brick
GW	broken off at the brick surface, not smelly, hard
MM	softer than the specimen containing gelatin, not smelly
MW	softer than the specimen containing gelatin, not smelly
TT	adhesion to brick very high, could not be pulled off with the fingers, specimen much harder than the ones containing animal glue
TW	adhesion to brick high, could be pulled off with a lot of force, broke about 1 mm below brick surface; specimen very hard

As a result of the test, it became obvious that animal glue provides a problem in warm water and therefore is more difficult to use. If the glue goes bad during drying, the clay specimens are soft, and they have a bad adhesion (besides being smelly).
Mixtures containing Tylose had a better flowability, which resulted in a better extrudability, the dried specimen were hard (stable against mechanical stress) and showed a better adhesion to the adobe brick.
The adhesion could be improved by pre-moistening. Even pre-moistening with water improved the adhesion, but a 0.5% solution of adhesive gave much better results. The mixture with Tylose showed the best adhesion. Using Tylose also for pre-moistening resulted in such a good adhesion that the specimen could not be pulled off by hand.

Tests for the improvement of clay mixtures for re-attaching broken parts

In this test series, the same materials, pumice powder and micro-balloons as inorganic fillers and *ming jiao* and Tylose as organic adhesives, were used. Different from tests 1 and 2, pumice powder and micro-balloons were not mixed, but used as sole additive.
The base of this test were mixtures used for gluing and stabilizing broken parts. Depending on the width of the break, the clay mixtures were applied with a spatula, a paint brush or a syringe with tubes or cannulas of different diameters.
Until 2011, only diluted clay was used. If the mixture was applied with a paint brush or spatula, an addition of fine sand was possible, but this was not possible if the mixture was to be injected. Adaptions of the viscosity were made by adding water (during working by intuition regarding the viscosity or flowability). Rather high shrinkage and poor adhesion of the clay suspension often resulted in a renewed opening of the break. In 2011, the addition of micro-balloons and pumice powder were tested in an empiric way, and a possible addition of Tylose was discussed, but not used.

Test 3 - Comparison of micro-balloons and pumice powder / **ming jiao**

At first a clay suspension was prepared (200 g).Waiting for 2 ½ hours allowed soaking and a certain swelling of the clay:

10 VP clay
10 VP water

The mixture was divided into two parts (together 10 VP):

1. + 2 VP micro-balloons
2. + 2 VP pumice

To both mixtures 1 VP *ming jiao*, 1 % (= 9.3 g) was added.

Small fragments of adobe bricks were used as test samples. They had one flat side (or were treated to have one) which was to be glued onto the surface of a complete adobe brick serving as support. The fragment and the adobe brick were sprayed with water or, in a second series, with 0.5 % *ming jiao*. The fragment was set on the adobe brick. Pieces of wire were used as spacer to create a gap of c. 1mm width. The clay mixture was injected into the gap from the side.
In this test, the mixture with pumice was more liquid and penetrated better into gaps, but the penetration was too poor in all cases.

In the next test series, the amount of *ming jiao* was increased from 1 to 2.5 VP to check if this would improve the penetration and the adhesion. The ratio in this test was:

5 VP clay
5 VP water
2 VP inorganic additives (pumice powder or micro-balloons)
2.5 VP *ming jiao* 1 %

To exclude the problem of poor penetration, the following test was made: the fragments and the brick were coated at the joining area, so that the "break" was completely filled. Figure 310 shows a scheme of the test series, fig. 311 shows a photo of test 3.
After several days of drying, the fragments were pulled off using fingers. Some of the fragments were so crumbly that they disintegrated during being pulled off, but mostly the result could be evaluated. The observations on this experiment are compiled in table 16.

Evaluation
- The mixtures with 2.5 VP *ming jiao* (and thus more water) penetrated better into the gap than the ones with 1 VP *ming jiao* solution, but the penetration still was incomplete and in some cases insufficient.
- Not surprisingly, the more material was in the gap and the flatter both surfaces were, the better was the adhesion. Therefore, it was not easy to compare all specimens as sometimes the surfaces were not perfectly flat and the joining area did not have the same size. All fragments which were coated with the clay mixture and then glued onto the brick had a better adhesion, what again shows the problem of insufficient penetration of the mixture into the gaps.
- In general, the mixtures with micro-balloons have a stronger adhesion than the ones with pumice powder.

PM		PW		MM		MW	
1		1		1		1	
2		2		2		2	
3 b	3 a	3 a	3 b	3 a	3 b	3 a	3 b
5 a	5 b	5 a	5 b	5 a	5 b	5 a	5 b
4 b	4 a	4 a	4 b	4 a	4 b	4 a	4 b
6 a	6 b	6 a	6 b	6 a	6 b	6 a	6 b
7 a	7 b			7 a	7 b		
8 a	8 b			8 a	8 b		

pre-moistening and application:
1 = pre-moistening with water; fragment stuck onto applied mixture
2 = pre-moistening with water; mixture penetrates into gap
3a, 5a = as 1, but small fragment
3b, 5b = as 2, but small fragment
4a, 6a = pre-moistening with *ming jiao*, fragment glued onto brick
4b, 6b = pre-moistening with *ming jiao*, allowing penetration into gap
7a, 8a = + 1 VT *ming jiao*, pre-moist. with *ming jiao*, fragment glued onto brick
7b, 8b = 1 VT *ming jiao*, pre-moistening with *ming jiao* allowing penetration into gap

mixtures:
PM = pumice / *ming jiao*
PW = pumice / water
MM = micro-balloons / *ming jiao*
MW = micro-balloons / water

Fig. 310
Scheme of test 3

Fig. 311
Test series 3 [Gao Yan, Shaanxi Institute for Conservation]

Table 16
Test 3, observations during pulling thee glued fragments off from the adobe by hand

no.	*adhesion of fragment to brick*	*position of break*
MW 1	not very strong	within the mixture
MW 2	did not penetrate into gap, adhesion stronger	at the surface
MW 3a	good	partly below the brick surface
MW 3b	did not penetrate, not strong	(surfaces)
MW 4a		broken below brick surface
MW 4b	penetrated partially, rather strong	
MW 5a	strong	within the mixture
MW 5b	penetrated rather well, good	
MW 6a	good	within the brick
MW 6b	good	within the brick or within the fragment
MM 1	not so strong	within the brick surface
MM 2	no penetration into the gap	within the mixture
MM 3a	good and strong	within the mixture
MM 3b	good, rather strong although no penetration into the gap	within the mixture
MM 4a	good, strong	below brick surface
MM 4b	no penetration into gap, but rather strong	
MM 5a	not very strong (maybe because of shape of the fragment)	below brick surface
MM 5b	no penetration into gap	
MM 6a	weak	below brick surface
MM 6b	strong	below brick surface, shrinkage crack within the mixture around fragment
MM 7a	weak	below brick surface
MM 7b	weak, penetrated a bit into gap	
MM 8a	strong	within the fragment
MM 8b	strong, penetrated into gap, but fragment was very small	
PW 1	weak	below brick surface
PW 2	weak, no penetration into gap	
PW 3a	strong	within the fragment
PW 3b	no penetration into gap, but rather strong	
PW 4a	strong	within the fragment
PW 4b	strong, but only partly penetrated into gap	
PW 5a	weak	below brick surface
PW 5b	good, but no complete penetration into the gap	within the fragment
PW 6a	weak	within surface of fragment
PW 6b	weak, did not penetrate into gap	
PM 1	weak	within the mixture and within the fragment
PM 2	rather strong, but only penetrated into gap where it was very big	
PM 3a	good	within the mixture
PM 3b	weak, did not penetrate into the gap	
PM 4a	strong	below brick surface
PM 4b	did not penetrate into the gap	below brick surface
PM 5a		below brick surface
PM 5b	strong, did not penetrate	below brick surface
PM 6a	weak (because of shape of fragment)	on brick surface
PM 6b	strong, but did not penetrate	on brick surface
PM 7a	not very strong (because of shape of fragment)	
PM 7b	weak, did not penetrate into gap	
PM 8a	strong	below brick surface
PM 8b	weak, did not penetrate into gap	

Test 4 – Comparison of ming jiao *and Tylose MH 300 / micro-balloons*

Test 4 was developed starting from the results of test 3. As the mixtures containing micro-balloons showed a better adhesion, only micro-balloons were used as inorganic additive. The aim of the test was to compare the effect of *ming jiao*, which had been used in the previous test, with Tylose MH 300.

The mixture contained:

5 VP clay
5 VP water
2 VP micro-balloons
3 VP adhesive solution

Adhesive solutions:

ming jiao: 1 % in water > mixture M
Tylose MH 300: 0.5 % (in water) > mixture T

The clay was mixed with the water and soaked for several hours before the micro-balloons and the adhesive were added. For pre-moistening water (W), *ming jiao* (M) or Tylose (T) were used. As in test 3, small fragments of adobe bricks were glued to a large fragment of an adobe brick which served as support. After drying the adhesion was tested by pulling the small fragments off by hand.
As in test 3, the single experiments were abbreviated with two letters, the first one indicating the clay mixture, the second one the pre-moistening material, for example:

MW = clay mixture containing *ming jiao*, pre-moistening with water
TT = clay mixture containing Tylose, pre-moistening with Tylose

Evaluation
The specimens MW broke within the fragment and could not be evaluated.
The specimens MM had a weak adhesion to the adobe. When pulled off, the break occurred within the gluing mixture.
The specimens TW had a stronger adhesion and the gluing mixture had a higher hardness. When pulled off, the surface of the brick was damaged.
The specimens TT had the strongest adhesion. When pulled off, the break occurred below the surface of the brick.

Evaluation of all the tests

The tests showed that with the addition of micro-balloons a stronger adhesion can be reached compared to the addition of pumice powder. There is no difference in shrinkage and both mixtures can be injected with rather thin tubes or cannulas, which is important for the application.
The addition of Tylose to the mixture and, in a diluted solution, as pre-moistening agent increases the adhesion. In the tests, the adhesion was so strong that some specimens could not be pulled off by hand and damages rather occurred within the brick surface or the glued-on fragment than in the gluing layer. Regarding conservation standards, this means that the adhesive strength is *too high*, as it is desired that a new break occurs within the gluing layer and not within the glued original parts. Regarding the situation in the Shuilu hall, one has to take into account that the surfaces are never as clean and as smooth as in the test series, and a comprehensive pre-moistening and spreading of the whole break surfaces is rather unlikely as most of the breaks or the voids inside the wall are not completely accessible. Therefore the addition of Tylose may be a suitable way to increase the adhesion with the aim to prevent glued parts from breaking again easily, as it was observed in the previous years. The problem of long-term stability of Tylose and its behavior with changing climate conditions could not be investigated in this test series, but should be considered and if possible, studied.

SUMMARY OF CONSERVATION WORK IN 2011 AND 2012

Conservation work in 2011

The main purpose of the work visit in October and November 2011 was to stabilise the endangered upper part of the mountain scenery of the EN wall. The treatments necessary for this aim were finished. In addition, further measures towards the conservation of the EN wall were started and partly finished.
For the documentation, all the figures were numbered in accordance with the numbering system introduced in 2001. Numbers for clouds and mountains which had not been registered at that time, were added.
The first step of the work was a thorough dusting with soft paint brushes and vacuum cleaner. This revealed occurrences of damage as well as many details of the fine modelling. Numerous findings were retrieved from layers of dust and debris. The largest amount was found next to *pusa* EN 4.21: about 500 fragments were discovered in layers of debris and dirt underneath the plaster of 1981-85 on top of the caved-in dais. All the findings were photographed, catalogued and stored in boxes.
The mountain scenery was stabilised using steel hanging wires. They are replacing the wires inserted during the renovation in 1981-85. Some new wires were added if necessary. The stabilisation of individual mountains and figures in the mountain scenery was finished, and small parts as hands and *piaodai* could be realigned, too. *Feitian* EN 4.5 was not re-attached yet because the conserved mountain to which it has to be mounted did not sufficiently dry during the work period.
The lower part of the wall was a side issue of the treatments intended in 2011. Conservation was started from top downwards. While it was possible to finish the southern (right) side of the *tianwang* in the middle area of the wall, the northern (left) side was not yet dealt with except for some "emergency treatments": As no temporary fixations by strings or pins should remain on the wall, some parts were conserved or fixed by unobtrusive wire fixations.
Thin elements reinforced by wire as *piaodai* and especially the beaded chain pendants provided a problem that could not be solved as far as it concerned the stabilisation of the corroded wires.

Treatments which could not be carried out

The treatments which remained to be done at a later date in order to finish the conservation on the EN wall can be classified into four groups:

a. Treatments which could not be finished in 2011 for lack of time or needed to be checked again
b. Problems of conservation that could not be solved
c. Aspects of the conservation not included in the programme of 2011
d. Additional and related questions

a. Treatments which could not be finished in 2011 for lack of time or needed to be checked again
This group comprises those treatments for which the methods and procedures were already clear, proven or discussed, but which could not be carried out or finished in 2011 for lack of time:

Investigation of the crack in the north-eastern corner (i. e. between the EN wall and the GN wall)
The crack was not investigated thoroughly, among other reasons because this would have required changing the construction of the scaffolding. The necessary steps are:
- investigation of the crack: depth, width, dislocation of fracture edges; development of cracks in the lower part covered with new plaster in 1981-85
- documentation of the crack situation
- consolidation of crack edges
- optionally: filling smaller voids or parts of the crack in order to reduce the width of the crack (closing the crack is not reasonable); maybe setting "bridges" over the crack acting as control of future movements .

Grouting of voids behind pusa EN 4.21 up to the cloud ledges
The system of cracks behind *pusa* EN 4.21 continuing towards the southern edge of the wall and probably reaching up next to EN 4.20 could not be investigated in detail. The voids can be filled by injection of a mixture containing inert additives as micro-balloons (glass microspheres as Scotchlite TM K1) or pumice powder (finest quality, grain size below 80µm) as tested in 2009 and used in 2011. Sufficient time has to be scheduled for this treatment. A season with warm and dry weather is advisable.

Re-attaching feitian EN 4.5 and reinserting panel (10)
Feitian EN 4.5 could not be re-attached in 2011. During the storage on a panel, the consolidated right arm and the wire of the *piaodai* around the head broke again. The necessary steps are:
- conservation of all the wires
- reconnection of the right arm
- decision on the type of mounting device to attach the *feitian*: As the possibilities to insert a mounting device into mountain S 26 are restricted to two small rectangular holes of 8 x 8 mm, the respective device has to be a thin long "stick". Only the lower hole is deep enough for a stable support. The mounting device can be made of metal, as probably the original one was (an iron pin), or of bamboo or wood.
- preparation of a loop of stainless steel hanging wire, wrapped up in Japanese paper, around the waist of the *feitian*
- attachment of the *feitian* to the mounting device, fastening of the hanging wire onto the mounting device

After the mounting of the *feitian* will have dried and the temporary fixations removed:
- gluing and definitely reinserting panel (10) behind the decorative bracket next to the north-east corner of the building

Conservation of the tianwang *and the* pusa *on the northern (left) side*
- stabilising EN 4.10 (connection to the wall)
- finishing conservation of small parts such as the decoration on caps and crowns, *piaodai* etc., at the figures EN 4.9, 4.10, 4.11, 4.15, 4.16, 4.17
- checking *pusa* 4.22 for damage
- replacing the brass wires at EN 4.10

Completion of the conservation of the tianwang *on the southern side,* pusa*,* baoshen fo
- finishing conservation of small parts of 4.13, 4.20 and 4.21
- checking pedestal of *baoshen fo* for necessary treatments
- checking pedestal, mountain and lower part of the body of *pusa* EN 4.22 for damage
- replacing brass wire at EN 4.19, *piaodai* shoulder to tip, right side

Check on tension of wires in the mountain scenery
- check on the tension of wires
- insertion of a new spacer underneath the wire through *kongzi* EN 4.2
- coating of the galvanized (zinc-plated) turnbuckles with Paraloid B 44 or B48 N (as for the material: *see below*)

b. Conservation problems which could not be solved in 2011
Two main problems could not be solved in 2011: the handling of elements with heavily corroded wire reinforcement and the caved-in dais.

Corroded iron wires – protection of wires and treatment of severely damaged elements
The corrosion of the original wires used as reinforcement of thin elements and the cores of the bead chain pendants is a problem not only at the EN wall, but in the entire hall. For the most part, thin exposed wires are heavily corroded, and the breakage and loss of many fine elements reinforced by wires is a severe problem.
For the treatment two conditions have to be distinguished:
1. The wire is corroded and fragile, breaks under mechanical stress (bending), but is still holding its own load or that of the attached clay modelling: this is the condition of most of the *piaodai*. The original wires should be protected and if necessary supported.
2. The wire is completely corroded up to the core, breaks at the slightest stress, and breaks into small pieces: this is the condition of the fragments of beaded chain pendants preserved at the EN wall. The original wires often cannot fulfil their purpose anymore.

For protecting the corroded wires, the corrosion process should be retarded. This can be done by coating the wires in order to reduce the contact of the wire surface to oxygen and humidity. The coating should be done before re-attaching fragments of modelling to the wire or inserting fillings and completions. For the coating, materials can be used which have been tested and proven for the conservation of metal objects such as:
- Paraloid B 48 N (Rohm & Haas):
  Methyl methacrylate copolymer; preparation in 2.5 % toluene + ethanol 7 : 3, Tg 50° C, hardness (KHN Knoop hardness number): 11-12[29], recommended for copper, bronze and zinc
- Paraloid B 44 (Rohm & Haas):
  Copolymer of methyl methacrylate and ethyl acrylate; soluble in toluene, xylene or acetone; very good ageing properties (best of the Paraloid types), but more brittle then B 48N. Tg 60° C, KHN hardness 15-16; recommended for bone, metal and stone
- Cosmoloid H 80 (available at Kremer Pigmente)
  microcrystalline wax, preparation: ca. 1 % in benzine (low aromatic content, boiling range 30-60°C), 'Siedegrenzbenzin' (boiling range 100-140 °C) or even white spirit / Shellsol T (boiling range starts at 187 °C)

For the situation in Shuilu'an, it seems more advisable to use one of the Paraloid types than the microcrystalline wax. Paraloid B 48N or B 44 can also be used to isolate new wires or metal elements that are not available in stainless steel.

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[29] KHN Knoop hardness number according to Dow chemicals, hardness measured as ultimate hardness of clear films; hardness measuring method after Tucon is also specified on the data sheets by Rohm & Haas.

Elements with severely corroded wires which have to carry a load of clay modelled elements need an extra reinforcement. There are several possibilities depending on the shape of modelling and the degree of damage. The following options have been discussed:
- wrapping up the damaged wire in Japanese paper coated with Paraloid (B 48 N or B 44). This can be used to reinforce weakened wires or to reconnect the ends of broken wires. Afterwards the 'bandaged' wire can be coated with a clay completion in order to increase the stability of the element.
- inserting a thin flexible wire next to the original one as a mechanical support: this treatment can only be done if the modelling allows the insertion of a second wire or if the modelling is already lost. It is not suited for the beaded chain pendants as there is no space inside the beads to insert a second wire. For the support wire, stainless steel or zinc-plated iron wire can be used. Both have to be coated with Paraloid (B 48 N or B 44) before – or after – inserting them to prevent an increase of corrosion on the original or the new wire.
- wrapping up the damaged part in some kind of gauze and tying this closely to the element. This proposal is derived from the conservation of fragile textiles which are "sandwiched" between almost invisible gauzes. For a possible application in Shuilu'an, further research on suited materials and application methods are necessary.
- removing the original wire and replacing it by a new wire: This is the ultimate solution for severely damaged parts and not really a conservation treatment as it means the loss of the original wire, but it may be the only way to restore the beaded chain pendants to a condition that allows to hang the pendants again and prevent the loss of more and more beads and small parts.

Pusa *EN 4.21 and dais*
The situation of the dais remained to be examined in detail. Around *pusa* EN 4.21 it obviously caved in some time ago and was repaired at least once before 1981. The decision on the treatment can only be made after the examination.
Proposed steps:
- examination of the surface of the dais in front of the *baoshen fo* and *pusa* EN 4.22 by means of small openings in the existing plaster surface of 1981-85
- examination of the situation around *pusa* EN 4.21 including the stability of the figure
- removal of all loose parts including fragments around EN 4.21 (so far only carried out on the southern side between pusa EN 4.21 and the pedestal of the *baoshen fo*)
- decision on a solution for the dais: removal of brick revetment in order to regain the original lower level?
- if necessary: finding a possibility to lift and adjust EN 4.21
- in any case: repairing and closing dais around *pusa* EN 4.21

Parts which could (and cannot) be fitted in anymore
Some broken-off parts could easily be assigned to their original position, but they could not be re-attached because they cannot be fitted in, either because the area is distorted or because there is a later completion. These fragments were stored, but so far there was (and still is?) no plan what to do with them:
- *piaodai* around the heads of EN 4.19 and EN 4.20 (no space because cloud ledge Y 3 has sagged)
- F 61 from *piaodai* of the canopy, northern part (completion of 1981-85 inserted there)
- feather fragments of *feitian* (probably EN 4.5) and other parts which could be assigned to a position but could not directly be attached

Background of shijiamouni *EN 4.3*
In 2011, the background of *shijiamouni* EN 4.3 was considerably reduced, and the remaining cloud and the tree nailed to the corbel bracket definitely were not in their original position. Four options to handle this situation were scheduled:
- leaving it in its given state
- taking off the cloud and the tree, so that all later additions would be removed
- trying to reconstruct the original situation by a thorough examination of the traces of the lost background on the wall and of all the parts that once belonged to its design (clouds, mountains). This might afford a lot of time.
- reconstruction of a background similar to the ones behind *kongzi* and *laozi* including preserved parts in order to regain a "fitting" background even if the execution, in parts, had to be a "free-style" imagination as the single elements cannot be distinctly aligned anymore.

c. Aspects of the conservation not included in the programme of 2011
In accordance with the schedule and aims set by the Chinese side, the following aspects were not part of the work programme in 2011:
- fine-cleaning of surfaces
- removal of clay suspension and dirty finger prints from 1981-85, as well as other residues (paint from rafters)
- consolidation of paint layers

d. Additional and related questions
The following aspects were discussed during the work visit, but no plan was established about how to proceed:

Check of the findings and attempt to find their original position
There were more than 500 findings, ranging from larger parts to tiny fragments. The fragments can be classified into several groups as *piaodai*, leaves, ornaments, ears etc., and subgroups such as green *piaodai,* red *piaodai* and pink ears, brown ears etc. The wall can be checked and recorded with regard to the same terms or groups (for example, missing ears: 4.1: right ear, 4.15: right ear, missing hands: GN 7.19b: right hand). This provides a possibility to bring missing parts together with collected findings and then to try out selectively which finding may belong where. Although time-consuming, this procedure offers a chance to re-integrate the findings; otherwise they would only contribute to the already enormous collection of hundreds of loose parts.

Further tests for clay-based grouting and 'gluing' mixtures
In 2011, too, new mixtures and variations of existent recipes were used. This revealed two problems:
- The mixtures used so far still are not ideal and thus constantly encourage variations. Especially the wish to increase the adhesive strength was discussed during each work phase.
- During the work on-site there is no time to make test series for comparing the new variations to the older ones.

Testing and comparing mixtures require time-consuming test series such as the ones carried out by K. Holl in 2008 / 2009. As this cannot be done hand in hand with the work on-site, it would be desirable to deal with this topic in a small research project, maybe a student work. As a preliminary list of questions the following aspects have emerged:

- comparison of mixtures with pumice powder to mixtures with micro-balloons
- tests with addition of animal glue: ratio, dilution and comparison to Tylose MH 300. This suggestion was inspired by the idea that animal hide glue (*ming jiao*) was traditionally added to clay mixtures and is still added to increase the adhesive strength of restoration mixtures (however, it is not clear if this was really a traditional and commonly used technique).
- tests with addition of other traditional binders or additives to clay mixtures such as glutinous rice water (*noumi jiang*), starch or egg white (?). This suggestion was inspired by the observation that there is almost no knowledge about traditional additives to clay mixtures, but obviously the craftsmen or artists of the Ming Dynasty were able to prepare clay mixtures of high adhesive strength and high creeping strength. They were able to attach clouds or other elements to the wall without supporting them during drying, a procedure that was unattainable with all the clay mixtures developed in the research project so far.

Conservation work in 2012

The aim of the conservation treatments carried out in 2012 was to finish the work started in the previous year. The work comprised checking and, if intended, improving the treatments done in 2011, and to treat the parts and problems which could not be finished in 2011.
The checking of treatments carried out in 2011 included controlling the tension of the hanging wires, replacing zinc-plated turnbuckles, coating original and modern wires to prevent corrosion and to check all parts re-attached or re-aligned in 2011. The wall was cleaned again with soft brushes and vacuum cleaner to remove the dust which had again accumulated on the reliefs and figures.
Finishing started work mainly concerned the southern (left side) group of six *tianwang* and the attempt to reattach more findings to the wall. The discovery of a lot of further fragments resulted in cleaning, stabilising and cataloguing them, and trying to reassemble them in larger units, including the fragments found in the previous years.
Solving the problems postponed in 2011 included three main activities: finding a treatment for elements with wire cores as the beaded chain pendants, re-attaching *feitian* EN 4.5, and lifting *pusa* EN 4.21.
It even was possible to carry out a test serious to compare additives to clay mixtures, as skin glue (*ming jiao*) in comparison to Tylose MH 300 and pumice powder in comparison to glass micro-balloons.

Most of the work steps which remained incomplete or unsolved in 2011 could thus be finished in 2012:

The crack in the south-east corner between the EN and ES wall was checked, but no treatment was done. The margins of the reliefs are stable, and closing the very deep gap does not seem reasonable as it is not necessary for the stability, requires large amounts of grouting material and will result in an aesthetically unsatisfying shape because the EN wall is deformed and the margins of the gap do not fit together.

After *feitian* EN 4.5 had been re-attached, panel (10) closing the interspace between the beams and the outside, was checked again. The panel is inserted in the correct position and stabilised with steel screws. At the outset, this solution was meant as a temporary measure. But as it seemed to be stable, the panel was not removed to prevent additional damage.

All the figures and reliefs on the wall were cleaned and stabilised. All the exposed wires were coated with Paraloid B 48 N. Many findings were checked to complete the reliefs and at least some of them were brought back to their original places, including parts of *piaodai* and decorative elements and a tree at the feet of EN 4.23. One of the preserved, but loose *piaodai* could be reinserted around the head of EN 4.19, but the *piaodai* belonging to EN 4.20 could not be inserted due to the deformation of the cloud ledge behind his head. The same applies to tree F 93: most probably it had been attached to the mountain peak of S 15 north of *shijiamouni* EN 4.3, but it cannot be re-inserted as the cloud formation below the *shijiamouni* was changed in 1981-85.
As the original positions of the clouds could not be ascertained without doubt, the clouds were not re-attached, even where the outlines of unpainted background gave sufficient evidence for the type of cloud that is missing. There still is the hope that the identification of more elements will be possible with the help of the old photographs taken in the 1970's and, if the wall is included, the ones from the Minguo period. This may include the clouds which probably formed the background of *shijiamouni* EN 4.3. Therefore it is our strong hope that the search for these photographs will be undertaken soon. The evaluation of the situation depicted there, may be used for the next work step.

Considerations on the treatment of beaded chain pendants and other parts with wire cores led to the decision to preserve the wires wherever possible and only to replace them as an *ultima ratio* (last resort), mainly if the stability of large elements is endangered. The risk of damaging the clay modelled elements during removing and replacing the original wires is rather high. The compromise of adding a supporting wire can often be used without being too obtrusive.
The figure of *pusa* EN 4.21 was lifted using a pulley. It was possible to rebuild the broken-in dais as a stable support for the *pusa*. While the pusa was lifted, the clay plaster layers of the walls behind (EN wall and GN wall) could be stabilised by grouting.

The tests with additives for clay mixtures for grouting showed that the addition of skin glue (*ming jiao* or gelatin) gave less good results than the addition of Tylose MH 300. The specimens were softer, less stable against mechanical damage and had less adhesion to the support. An additional problem was that in the warm summer water animal glues went bad rapidly, often during the drying of the clay sample. This resulted in a severely decreased stability.
The comparison between mixtures with glass micro-balloons and pumice powder showed that both dry without significant shrinkage. Mixtures with micro-balloons penetrate better into gaps than the ones with pumice powder, probably because the pumice takes up more water. The flowability of mixtures with micro-balloons is better, which results in a better spreading and penetration into gaps and thus in a higher adhesion.
Insufficient penetration, however, remains an unsolved problem of all the mixtures.
The most stable clay mixtures and those with the best adhesiveness are the mixtures with glass micro-balloons and Tylose MH 300, especially if diluted Tylose is used for pre-moistening (effect of a primer). Pumice powder can be used to modify the shape of the additives as it is irregular in contrast to the round glass spheres.

The aspects not included in the programme in 2011 (*see above: paragraph c*) - fine cleaning of surfaces, consolidation of paint layers and removal of clay from the surfaces - neither did belong to the agenda of 2012. These steps of work have to be postponed until the whole hall will be treated or at least until the ES wall will be cleaned.

A completely different aspect - not connected with the work at the EN wall - is the ***repair of the roof***. In 2011, damage to the roof of the Shuilu hall was visible that has increased at least since 2007: On the east side, there is a plant growing on the roof, and on the corner next to the western side building, tiles are loose and at least one is at risk of falling down.
The west side shows severe problems of drainage resulting in salt efflorescence marks on the gable sides and a dramatic decay of the rafter heads on the west side: all the rafters are wet, fungi are growing, the wood is soft and deteriorating. The damage to the wood and the salt marks indicate that the water is not running down the roof and dripping onto the ground, but is penetrating into the side walls and running back onto the rafters. As the purlin on the new brick wall is intended to lighten the burden on the west wall (where the purlin is missing), it is essential that a further decay of the wood is prevented. Probably constructional changes are required to improve the drainage of rain water. The problem of the moistening of the west wall by rain water has been mentioned by the German side in 1998 and again, before the erection of the new protective brick wall in 2007. The question has to be discussed by the Shaanxi Research Institute for Conservation of Cultural Property and the Institute for Ancient Architecture whose architects are in charge of the building conservation.

In 2011 and 2012, the German and the Chinese restorers became a very efficient team. The advantage of including the same persons over a longer period is evident as information on many practical details can only be preserved in this way. Understanding and trusting each other is also an important part and takes time, especially where the gap caused by the language barrier has to be bridged. The support by local persons, the temple staff and people from the village, was an invaluable help. The good results achieved in 2011 and 2012 thus are also due to the existence of an experienced and field-tested German-Chinese team.
Including students in the practical work in Shuilu'an meanwhile has a tradition of several years. Since 2007 German, Chinese and international students have participated in the work stay. The work in Shuilu'an is especially suited to include and train students as in each work phase different steps of the work (documentation, examination and conservation treatment) have to be done running parallel to each other, so that several people can work in close contact, but still independently. On the other hand, the multitude of objects means that work steps have to be repeated many times, and thus offer excellent conditions for training and practise.
In 2011, the participation of students proved again to be reasonable and fruitful for both sides. While students get the possibility to gain practical experience, they do not only contribute to the results by enlarging the work team, but also make it possible to "outsource" small projects which can be handled by students. In 2011, the students photographed, catalogued and packed the findings and provided part of the graphic documentation. Furthermore, their friendly and open-minded character was a profit for the whole team. For these reasons, the inclusion of students into the work team can highly be recommended.

APPENDIX

LIST OF FINDINGS 2011 AND 2012

Overview according to places of finding

1. Findings

fragment no.	*place of finding*
F 1 – F 77	behind and on left side of *pusa* EN 4.21, imbedded in debris on top of dais
F 138-F 160	
F 134	dais, right side and lap of *baoshen fo*
F 164	
F 162	floor in front of dais
F 106 – F 107	pedestal of *baoshen fo*, middle of front
F 108	pedestal of *baoshen fo*
F 95 – F 97	pedestal of *baoshen fo*, left side
F 163	pedestal of *baoshen fo*, right side
F 92 – F 94	left side of lotus seat of *baoshen fo*
F 135	
F 98	pedestal of *jingang* of north gable wall
F 117 – F 122	north gable wall EN: between left foot of *jingang* GN 8.12 and dais of *baoshen fo*
F 123	
F 161	behind *jingang* GN 8.12
F 99 – F 104	behind *pusa* EN 4.22
F 133	
F 78 – F 80	behind mountains, behind *kongzi* EN 4.2
F 81 – F 83	behind mountains, behind pagaoda EN T1
F 84 – F 86	behind mountains, behind *laozi* EN 4.4
F 87 – F 88	behind mountains, behind *shijiamouni* EN 4.3
F 114 – F 116	behind the mountains, behind *feitian* 4.5
F 124	behind *feitian* 4.5 and behind *feitian* 4.6
F 125	behind the mountains, behind *feitian* 4.6
F 126 – F 129	behind the mountains, behind monk 4.1
F 132	corner between EN and GN wall, behind mountains (top of the wall)
F 89	between Laozi and white pagoda EN T1
F 90	left of deer 4.B1
F 91	on cloud ledge in front of feet of 4.12
F 105	on top of canopy of *baoshen fo*
F 109	cloud ledge in front of feet of EN 4.13
F 110 – F 112	between EN 4.19 and EN 4.20
F 182	
F 113	on top of mountain right of *kongzi* EN 4.2
F 130 – F 131	between S5 and S2, next to Y7
F 166 – F 174	behind mountains (?)
F 180	from EN 4.13
F 179	found on the floor, 2011-11-11
F 181	
F 183	behind GN 7.19 b, inside GN wall
F 184	behind *baoshen fo*
F 185	at left foot of EN 4.20
F 186	on the lap of *baoshen fo*
F 187	found behind *pusa* 4.22, 2011-11-11
F 188	found behind *pusa* 4.22
F 190	from 4.19

2. Parts detached from the wall

no.	*place of finding*
F 165	taken down from helmet of 4.13, centre, back > re-attached
F 175	from *shijiamouni* EN 4.3
F 176	cloud behind *shijiamouni* EN 4.3
F 177	cloud behind *shijiamouni* EN 4.3
F 178	mountain, standing loose behind *shijiamouni* EN 4.3, at the right to the cantilever
F 180	from EN 4.13
F 183	behind GN 7.19 b, inside GN wall
F 189	between GN 7.19 a and mountain on his right side
F 194	detached from canopy center
F 195	detached from *pusa* 4.22
Y 7	detached from wall

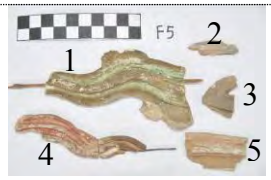
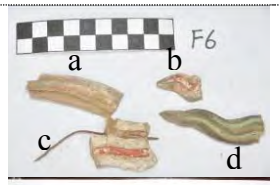
Overview on boxes repacked in 2012

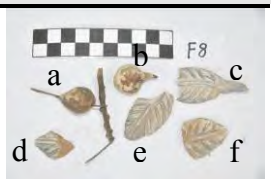
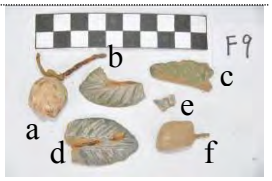
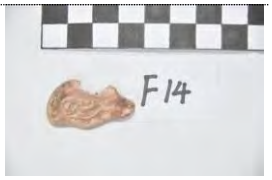
In 2012 the boxes were re-packed according to positions and types of fragments. List according to Gao Yan:

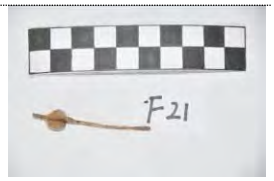
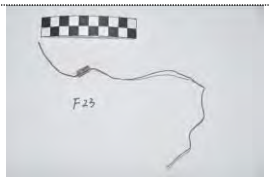
Box no.	*content*
Box 51	*probably from GN wall*: F 1, F 10, F 11, F 14, F 17, F 20, F 27, F 30, F 44, F 47, F 53, F 62, F 63, F 64, F 77, F 92, F 95, F 99, F 101, F 118, F 121-2, F 122, F 139, F 159, F 161, F 196, F 197, F 199, F 220, F 221, F 222, F 224, F 225, F 226, F 227, F 228, F 229, F 234, F 240
Box 52	F 74, F 75, F 82, F 85, F 139 (or in box 51), F 149; *mountain* F 178; *clouds* F 175, F 4; *clay support element* F 260
Box 53	*green piaodai*: F 5-2, F 16, F 19+40, F 29 (or in box 62), F 34, F 34+F 205, from F 34, from F 34, F 34+F 154, F 34+F 154+F 205, F 37-1①, From F 37, From F 37, F51, F55, F59, F60+F 216+F 37-1③, F84, F91, F 100, F 102, F 111, F 112+F 205, F 134, F 146, F 151, F 153, F 154+F 146, F 154, From F 154, F 163 (or in box 62?), F 179, From F 203, From F 205, F 205, F 217, F 218, F 219, F 235, F 245, F 250, F 254, F 258 *red piaodai*: F 23, (F 85: part of mountain, probably another box), From F 35, F 35+F6, F 37-1④, From F 154, From F 180, F 204, F 249, F 251, F 253, fragment of *piaodai*: F 256
Box 54	*clouds*: Y7, F 2, F5-1, F5-3, F5-4, F 6; from F 6; from F 34; from F 35; F 37-2; F 56; F 57; F 68, F73-1, F 89-1, F 90, F 94, F 141, F 203, F 246, F 252
Box 55	F 65, F 69, F 79, F 80, F 84, F 87
Box 56	F 32; F 33; F 132, F 166 to F 174
Box 57	packed in 2011 with: F 126
Box 58	packed in 2011 with: F 61, F 88, F 91, F 112, F 125, F 127, F 165, F 179, F 180, F 181, F 182, F 184, F 185, F 186, F 187, F 188, F 190, F 191, F 192, F 193
Box 59	(F 61: in box 62?), F 66, F 72, F 73, F 81, F 86, F 113, F 114, F 115, F 116, F 120, F 124, F 129, F 152, F 183, F 189
Box 60	clouds F 3, F 78, F 97, F 176
Box 61	not existent
Box 62	*cloud* F 4 (or in box 52?), *fragments of clouds*: F 5; *tree*: F 93, *blossoms/fruits and leaves*: F 131, F7, F8, F9, F 14 (ear!), F 37-1, F 42, from F 73, F 142, F 148, F 211, F 230, F 238; *fragments, unclear*: F 49, From F 73, F 160, F 180, F 190, F 208, F 209, F 212, F 156, F 123, F89-2, F 241, F 185, F 231, F 108, F 150, F 181, F 248, F 263, From F 37, F 239, F 255, wires from F 194, wires from F 195 big *piaodai* from canopy of *baoshen fo*: F 61 *hair*: F 76, F 164, F 202, F 232; *piaodai without paint*: F 31, F 25, F 29, F 37-1②, F 37-⑤, F 58, F 122-3, F 155, F 157, F 206, F 237 decoration of pedestal of *baoshen fo*: F 122-5, F 143, F 144 *beaded chain pendants*: F 12, F 15, F 18, F 21, F 36, F 98, F 104, F 106, F 107, F 117, F 119, F 158, F 162, F 188, F 198, F 201, F 248, F 242; F 243, F 244, F 247 *headgear*: F 39, F 41, F 43, F 46, F 122-4, F 163, F 200, F 210, F 233; *wing of feitian*: F 52
Box	cloud F 177

missing in the list from 2012:
F 48, F 67, F 70, F 88, F 109, F 125, F 126, F 127, F 128, F 138, F 140, F 147, F 184-1, F 187, F 191, F 193, F 213, F 214, F 223

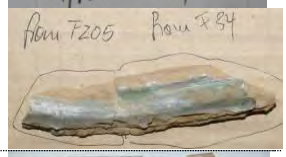
Description of findings and detached parts (state of August 2012)

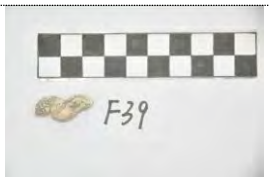
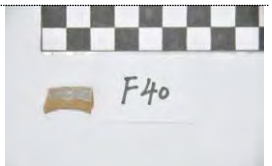
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 51	F 1	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	head of a dragon, gilded, broken apart along crack after salvaging and glued with clay suspension	14 x 6 x 6	glued	
Box 54	F 2	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	part of a red and white cloud, broken in two pieces		glued	
Box 60	F 3	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	cloud, painted red and white		glued; break stabilized with imbedded Japanese paper on the back	
Box 52 (?)	F 4	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	cloud, (painted red and white?)		glued	
Box 53 Box 62 Box 54	F 5-2 F 5-3 F 5-1 F 5-3 F 5-4	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	1: part of tail of green cloud 2: from piaodai, grey underpainting 3: from pedestal 4: cloud or piaodai 5: *with F 6?*			
Box 54	F 6	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	a: part of *piaodai* b: tip of red cloud tail c: part of tail of red and white cloud d: tail of green cloud		F6 a connected to parts of *piaodai* from F 35	 
Box 62	F 7	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	leaf and red fruit or blossom			

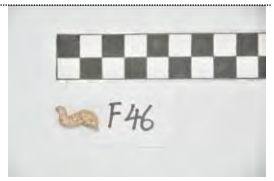
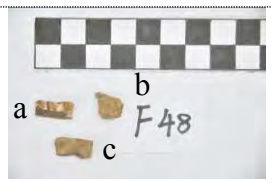
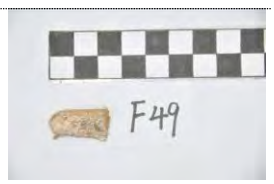
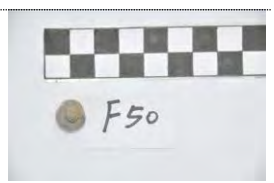
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 62	F 8	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	a: part of twig with fruit b: fruit, red c: leaf, tip missing d: tip of leaf e: leaf f: tip of leaf			
Box 62	F 9	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	a: fruit with remnant of wire b: part of leaf c. part of leaf d: leaf e: fragment of leaf f: fruit?			
Box 51	F 10	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	left hand, pink			
Box 51	F 11	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	left head, dark pink			
Box 62	F 12	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	rosette, gilded, broken apart, with fragment of bead chain	diameter 2.2 cm		
-----	F 13	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	rosette application, gilded	diameter 2.5 cm	attached to belt of EN 4.15 in 2012	
Box 51	F 14	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	right ear, pink, mould-made			
Box 62	F 15	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	rosette, gilded, with remnant of chain bead wire	diameter 2.2 cm		

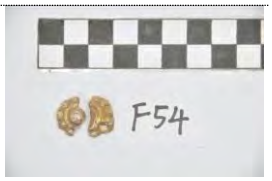
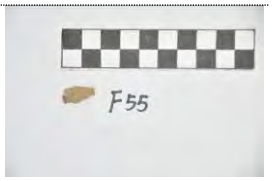
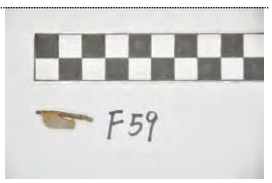
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 53	F 16	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	*piaodai* ?, green ?			
Box 51	F 17	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of a cloud			
Box 62	F 18	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of bead chain with four beads			
Box 53	F 19	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of *piaodai*, broken in two parts, probably green		glued, attached to F 40 and one fragment from F 205 in 2012	 
Box 51	F 20	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of *piaodai* or attribute	6 x 2		
Box 62	F 21	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of bead chain with wire and a half bead			
----	F 22	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	belt strap from belt of a *tianwang*, painted pink		re-attached in Aug. 2012 to *tianwang* EN 4.18	
Box 53	F 23	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	wire of *piaodai*, with tiny fragment of red *piaodai* preserved, wire broken into two parts			

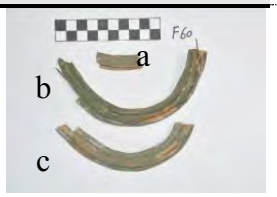
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
----	F 24	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	accessory of headgear (probably cap): bead and element on wire, painted red		attached to crown of *pusa* EN 4.21 in Aug. 2012	
Box 62	F 25	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of *piaodai*			
----	F 26	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	accessory of headgear, painted red		attached to crown of *pusa* EN 4.21 in Aug. 2012	
Box 51	F 27	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment, painted pink, with traces of red			
----	F 28	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	gilded feather tip of *feitian*, probably EN 4.5		re-attached to his right wing in Aug. 2012	
Box 53 or box 62	F 29	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment, maybe *piaodai*, with white priming layer			
Box 51	F 30	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment, probably from pedestal of *baoshen fo*			
Box 62	F 31	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment			
Box 56	F 32	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	a: twig of tree (part of relief on GN wall ?) b: six small sticks (incense sticks)			

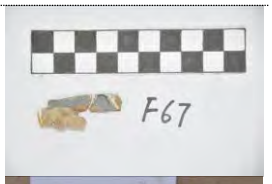
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 56	F 33	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	eleven fragments of wire			
Box 53, 1 part box 54	F 34	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	77 fragments of green *piaodai*	one part re-attached to EN 4.16 below his left arm		 
					one part attached to part from F 205		
Box 53, 1 part box 54	F 35	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	seven larger fragments of cloud tails or *piaodai*, painted white and red			
Box 53				36 smaller fragments of red *piaodai*			
Box 53						F 6 a connected to parts of *piaodai* from F 35	
Box 62	F 36	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	1 complete bead 49 parts of beads			

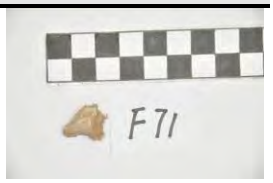
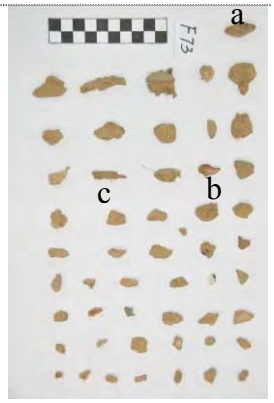
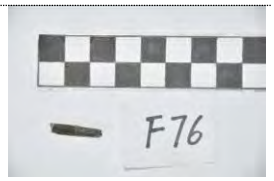
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 53 Box 62	F 37 F 37-1 F 37-1 ② F 37-1 ⑤	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	various small fragments of red or green *piaodai* or other elements			
Box 54	F 37-2			F 37-2: part of cloud			
	F 38			*number omitted*			
Box 62	F 39	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	small s-shaped element, grey underpainting			
Box 53	F 40	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of *piaodai* ?, green ?		F 40 attached to F 19 and one fragment from F 205	 
Box 62	F 41	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	red spiral accessory			
Box 62	F 42	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	element, reddish brown ?			
Box 62	F 43	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	small s-shaped accessory			

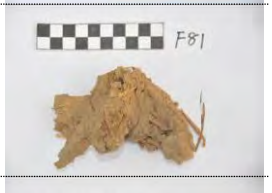
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 51	F 44	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment small element			
Box 62	F 45	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of element			
Box 62	F 46	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	small S-shaped element, painted red ?, maybe headgear accessory			
Box 51	F 47	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of pink part			
Box	F 48	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	three fragments of gilded parts			
Box 62	F 49	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of gilded part			
----	F 50	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	curl of hair of *baoshen fo*, painted black		re-attached above left temple of *baoshen fo* in Aug. 2012	
Box 53	F 51	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of *piaodai*?, painted green ?			
----	F 52	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	small S-shaped element, gilded		attached to headgear of EN 4.15	

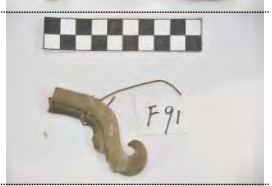
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 51	F 53	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of ornament			
Box	F 54	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	rosette, broken into two parts	diameter 2 cm	attached to crown of *pusa* EN 4.22	
Box 53	F 55	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment, traces of paint			
Box 54 (or box 56)	F 56	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	tip of element (cloud?), painted green			
Box 54	F 57	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	tip of element (cloud?), painted pink			
Box 62	F 58	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment, painted white			
Box 53	F 59	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of *piaodai*?, with grey underpainting			

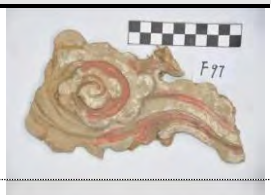
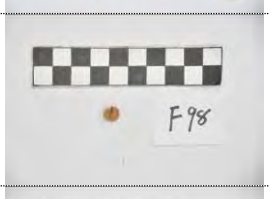
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
	F 60 a	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	three fragments of green *piaodai*		F 60 a connected to *piaodai* at left arm of EN 4.16	
							
Box 53	F 60 b					F 60 b connected to F 216 and F37-1 ③	
						F 60 c connected to F 145 and re-attached to EN 4.16 around head, right part	
	F 60 c						
Box	F 60	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	three fragments of green *piaodai*		c re-attached to EN 4.16 around head, right part	
							
Box 62 (or box 59)	F 61	behind and on left side of *pusa* EN 4.21, debris on the dais	2011-10-20 to 21	fragment of red *piaodai*, broken into two parts		left side of *piaodai* of canopy, remodeled in 1980-85	
Box 51	F 62	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of railing on GN wall			

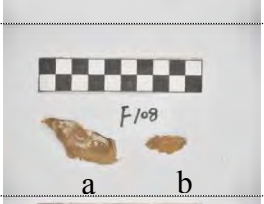
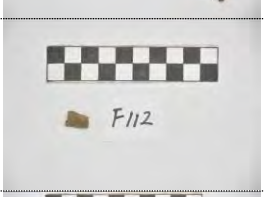
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 51	F 63	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment, painted red			
Box 51	F 64	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of ornament, not painted			
Box 55	F 65	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragments of modeling with clay straw mud, no surface (either mountains or top surface of dais ?) a: part of adobe (brick ?)			
Box 59	F 66	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment with traces of red			
Box	F 67	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of *piaodai* ?, grey underpainting		glued together in 2012	 
Box 54	F 68	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment			
Box 55	F 69	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	piece of wood (branch with bark)			
Box 53 (?)	F 70	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragment of *piaodai*, painted green			

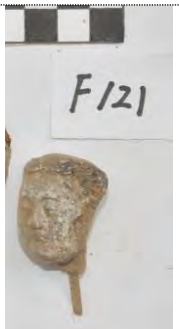
storage place (box no.)	*fragment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box	F 71	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	tip of element, traces of paint			
Box 59	F 72	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	?			
Box 59 box 54 box 62 box 62	F 73 73-1 F 73 a from F 73	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	55 fragments, partly with traces of paint 73-1: part of cloud a: blossom? b, c: parts of *piaodai*			
Box 52	F 74	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragments of modeling with clay straw mud, partly surface with traces of white paint (either mountains or top surface of dais ?)			
Box 52	F 75	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	fragments of modeling with clay straw mud, no surface (either mountains or top surface of dais ?)			
Box 62	F 76	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	strand of black hair ?			
Box 51	F 77	behind and on left side of *pusa* EN 4.21, in debris on top of dais	2011-10-20 to 21	wood with traces of gold leaf: weapon of jingang from GN *wall* ?			

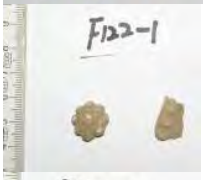
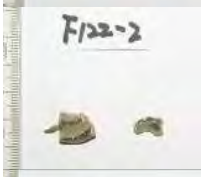
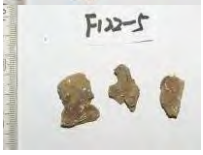
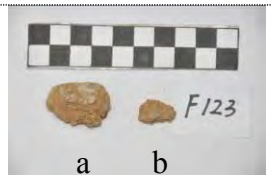
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 60	F 78	behind mountains, behind Kongzi EN 4.2	2011-10-18	cloud, broken into two parts, not painted ?			
Box 55	F 79	behind mountains, behind Kongzi EN 4.2	2011-10-18	fragments with paint layer a: backside of mountain peak ?			
Box 55	F 80	behind mountains, behind Kongzi EN 4.2	2011-10-18	four fragments c: *piaodai*?, not painted e: piece of wood			
Box 59	F 81	behind mountains, behind pagaoda EN T1	2011-10-18	fragment of straw mud modeling			
Box 52	F 82	behind mountains, behind pagaoda EN T1	2011-10-18	three fragments without surface			
Box	F 83	behind mountains, behind pagaoda EN T1	2011-10-18	three splinters of wood (from rafters ?)			
Box 55	F 84	behind mountains, behind Laozi EN 4.4	2011-10-18	backside of a mountain?, with impressions of strings (and straw ?)			
Box 52	F 85	behind mountains, behind Laozi EN 4.4	2011-10-18	two fragments without surface			
Box 59	F 86	behind mountains, behind Laozi EN 4.4	2011-10-18	seven fragments without paint layer			
Box 55	F 87	behind mountains, behind Shijiamouni EN 4.3	2011-10-18	three fragments of tiles shards (original ?)			

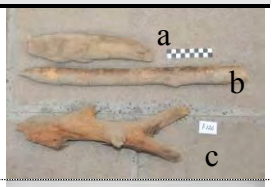
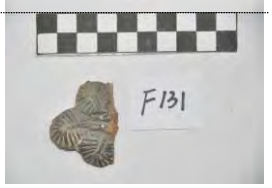
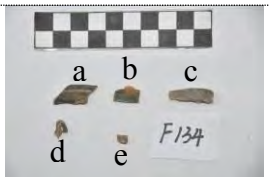
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box	F 88	behind mountains, behind *shijiamouni* EN 4.3	2011-10-18	four fragments without paint layer a: with part of hemp string b: impression of straw d. modeled surface without paint			
Box 54 Box 62	F 89-1 F 89-2	between *laozi* and white pagoda EN T1	2011-10-18	F 89-1: tail of a red cloud 2. fragment with grey under-painting (background)			
Box 54	F 90	left of deer 4.B1	2011-10-20	tail of cloud from 1980-1985			
Box 53	F 91	on cloud ledge in front of feet of 4.12	2011-10-20	end of green *piaodai* with wire hook for attachment			
Box 51	F 92	left side of lotus seat of *baoshen fo*	2011-10-20	ornament without paint layer			
Box 62	F 93	left side of lotus seat of *baoshen fo*	2011-10-20	part of a tree (top missing)		below Sakyamuni?, to the right of the cloud under his feet	
Box 54	F 94	left side of lotus seat of *baoshen fo*	2011-10-20	two parts of a cloud or part of pedestal ornament?, not painted			
Box 51	F 95	left side of pedestal of *baoshen fo*	2011-10-20	wave from “500 *luohan* crossing the sea” on GN wall			
----	F 96	left side of pedestal of *baoshen fo*	2011-10-20	tree		re-attached in 2012to the cave with EN 4.23, at the feet of the corpse	

storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 60	F 97	left side of pedestal of *baoshen fo*	2011-10-20	half cloud, painted red and white			
Box 62	F 98	pedestal of *jingang* of north gable wall	2010-10-21	half bead			
Box 51	F 99	behind *pusa* EN 4.22	2010-10-21	cloud fragment ?, gilded		South gable wall or pedestal of *baoshen fo*	
Box 53	F 100	behind *pusa* EN 4.22	2010-10-21	fragment of a green *piaodai*, in two pieces		fragments glued togehter	
Box 51	F 101	behind *pusa* EN 4.22	2010-10-21	part of *piaodai* or strand of hair?, painted black			
Box 53	F 102	behind *pusa* EN 4.22	2010-10-21	part of *piaodai* ?, painted black or green			
----	F 103	behind *pusa* EN 4.22	2010-10-21	part of red *piaodai*		re-attached onto left shoulder of EN 4.21 in Aug. 2012	
Box 62	F 104	behind *pusa* EN 4.22	2010-10-21	half bead			
----	F 105	on top of canopy of *baoshen fo*	2010-10-21	bead chain with ornament from canopy, was lying on top of second spike on the right side		attached to southern arm of canopy in 2012	
Box 62	F 106	pedestal of *baoshen fo*, middle of front	2010-10-21	2 small beads, broken apart (2 parts)		canopy of *baoshen fo*	

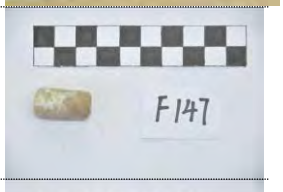
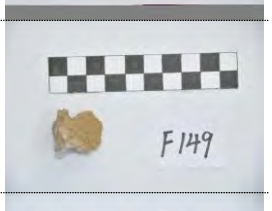
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 62	F 107	pedestal of *baoshen fo*, middle of front	2010-10-21	2 small beads, broken apart (2 parts)		canopy of *baoshen fo*	
Box 62	F 108	pedestal of *baoshen fo*	2010-10-21	two fragments with traces of pink		spike of canopy ?	
Box	F 109	cloud ledge in front of feet of EN 4.13	2010-10-21	two fragments, painted grey			
--	F 110	between EN 4.19 and EN 4.20	2010-10-21	part of *piaodai*, around head of EN 4.20		re-attached in Aug, 2012	
Box 53	F 111	between EN 4.19 and EN 4.20	2010-10-21	part of *piaodai* around head of EN 4.19		could not be re-attached (yet)	
Box 53	F 112	between EN 4.19 and EN 4.20	2010-10-21	fragment, from *piaodai* ?		glued to part of F 205?	
Box 59	F 113	on top of mountain right of Kongzi EN 4.2		fragment			
Box 59	F 114	behind the mountains, behind *feitian* 4.5	2011-10-18	a, b: wire c: wooden piece d: bamboo			
Box 59	F 115	behind the mountains, behind *feitian* 4.5	2011-10-18	2 fragments, from backside of mountain peaks ?			
Box 59	F 116	behind the mountains, behind *feitian* 4.5	2011-10-18	eleven fragments without surface			

storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 62	F 117	between left foot of *jingang* GN 8.12 and dais of *baoshen fo*	2011-10-20	hanging element from bead chain, gilded			
Box 51	F 118	between left foot of *jingang* GN 8.12 and dais of *baoshen fo*	2011-10-20	*piaodai*? reddish brown ?			
Box 62	F 119	between left foot of *jingang* GN 8.12 and dais of *baoshen fo*	2011-10-20	part of bead chain with seven beads and gilded ornament			
Box 59	F 120	between left foot of *jingang* GN 8.12 and dais of *baoshen fo*	2011-10-20	fragment of plaster ?, with traces of whitewash ?			
Box 51	F 121-2	between left foot of *jingang* GN 8.12 and dais of *baoshen fo*	2011-10-20	head of a small sculpture	3 x 2 cm	GN wall	
Box 52	F 121-1	between left foot of *jingang* GN 8.12 and dais of *baoshen fo*	2011-10-20	spiral wire		from crown of *pusa* 4.21> re-attached in 2012 on the right side of the crown	

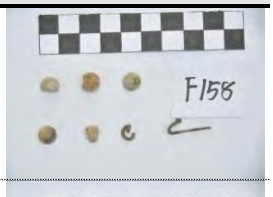
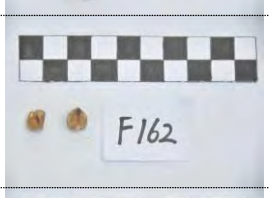
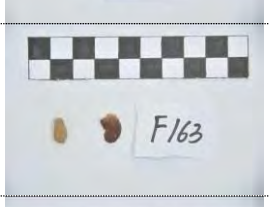
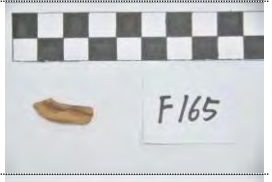
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
	F 122	between left foot of *jingang* GN 8.12 and dais of *baoshen fo*	2011-10-20	17 small fragments:			
----	F 121.1			122-1: rosette and part of ornament		122-1: rosette attached to crown of *pusa* EN 4.21	
Box 51	F 122-2			122-2: *piaodai* or strand of hair			
Box 62	F 122-3			122-3: part of piaodai			
Box 62	F 122-4			122-4: three red spiral decorations from headgear			
Box 62	F 122-5			122-5: three fragments from ornaments, maybe pedestal of *baoshen fo*			
Box 62	F 123	between left foot of *jingang* GN 8.12 and dais of *baoshen fo*	2011-10-20	end of *piaodai* of *jingang* GN 8.12, between his feet	end of *piaodai*		
Box 59	F 124	behind *feitian* 4.5 and behind *feitian* 4.6		nine fragments without paint layer			
Box	F 125	behind the mountains, behind *feitian* 4.6	2011-10-18	three fragments without modeled surface			

storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 57	F 126	behind the mountains, behind monk 4.1	2011-10-18	three pieces of wood: a: ? b: peg c: branch of tree?			
Box	F 127	behind the mountains, behind monk 4.1	2011-10-18	red element with wire substructure			
Box	F 128	behind the mountains, behind monk 4.1	2011-10-18	two fragments, not painted (mountain parts ?)			
Box 59	F 129	behind the mountains, behind monk 4.1	2011-10-18	16 fragments with paint layer			
----	F 130	between S5 and S2, next to Y7	2011-10-18	tree		peak of mountain S 5 > re-attached in Nov. 2011	
Box 62	F 131	between S5 and S2, next to Y7	2011-10-18	leaves of a tree			
Box 56	F 132	corner between EN and GN wall, behind mountains; behind panel (10)	2011-10-17	a: part of adobe brick b: wooden block			
with-out box	F 133	behind *pusa* EN 4.22	2011-10-21	*piaodai*: gilded, central groove black	ca. 80 cm long	big *jingang* of GN wall	
Box 53	F 134	dais, right side and lap of *baoshen fo*	2010-10-27	five fragments of green *piaodai* a: b: c: d: e:			

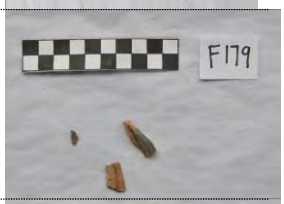
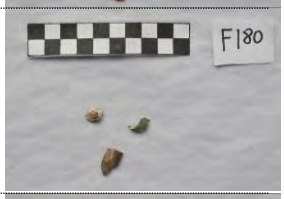
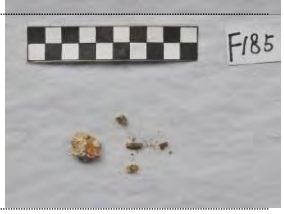
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
----	F 135	left side of lotus seat of *baoshen fo*	2010-10-21	gilded feather tip on wire		wings of *feitian* EN 4.5 > re-attached in Nov. 2011	
	F 136			*number omitted*			
	F 137			*number omitted*			
Box	F 138	debris inside dais around *pusa* EN 4.22					
Box 51 or box 52	F 139	debris inside dais around *pusa* EN 4.22		rosette-shaped ornament, gilded		decoration of pedestal of *baoshen fo*?	
Box	F 140	debris inside dais around *pusa* EN 4.22					
Box 54	F 141	debris inside dais around *pusa* EN 4.22		part of white-and-red cloud			
Box 62	F 142	debris inside dais around *pusa* EN 4.22		leaf			
Box 62	F 143	debris inside dais around *pusa* EN 4.22		part of decoration of pedestal of *baoshen fo* ?		decoration of pedestal of *baoshen fo*?	
Box 62	F 144	debris inside dais around *pusa* EN 4.22		part of decoration of pedestal of *baoshen fo* ?		decoration of pedestal of *baoshen fo*?	

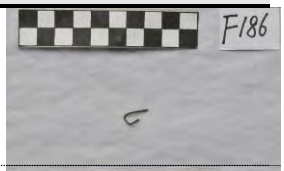
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
-----	F 145	debris inside dais around *pusa* EN 4.22		part of green *piaodai*		left part attached to F 60	
							
						re-attached to EN 4.16, *piaodai* around head	
Box 53	F 146	debris inside dais around *pusa* EN 4.22		part of *piaodai*, grey underpainting		broken, glued;	
						attached to part from F 154	
Box	F 147	debris inside dais around *pusa* EN 4.22					
Box 62	F 148	debris inside dais around *pusa* EN 4.22		part of twig with fruit or blossom			
Box 52	F 149	debris inside dais around *pusa* EN 4.22					
Box 62	F 150	debris inside dais around *pusa* EN 4.22					

storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 53	F 151	debris inside dais around *pusa* EN 4.22		part of *piaodai*			
Box 59	F 152	debris inside dais around *pusa* EN 4.22					
Box 53	F 153	debris inside dais around *pusa* EN 4.22		two parts of *piaodai*			
Box 53	F 154	debris inside dais around *pusa* EN 4.22		12 small fragments		two parts from F 154 glued together	
						parts from F 154 glued to F 67	
						a part connected to a part from F 34, a part from F 205	
Box 62	F 155	debris inside dais around *pusa* EN 4.22		four small fragments			
Box 62	F 156	debris inside dais around *pusa* EN 4.22		four fragments			
Box 62	F 157	debris inside dais around *pusa* EN 4.22		eight fragments d: strand of hair		F 157 d attached to EN 4.17 above his left temple	

storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 62	F 158	debris inside dais around *pusa* EN 4.22		four parts of beads two wires			
Box 51	F 159	debris inside dais around *pusa* EN 4.22					
Box 62	F 160	debris inside dais around *pusa* EN 4.22		a: fragment b: wire			
Box 51	F 161	behind *jingang* GN 8.12		fragment of figure?			
Box 62	F 162	floor in front of dais		two halves of bead			
(Box 53) or box 62	F 163	pedestal of *baoshen fo*, right side		2 small fragments			
Box 62	F 164	dais, right side		2 small fragments			
---	F 165	lying on helmet of EN 4.13		part of helmet decoration on centre of helmet, back		re-attached to EN 4.13	
Box 56	F 166	behind mountains (?)		terracotta			
Box 56	F 167	behind mountains (?)					

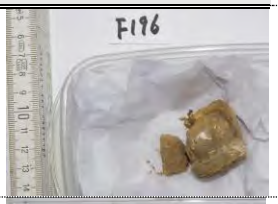
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 56	F 168	behind mountains (?)					
Box 56	F 169	behind mountains (?)					
Box 56	F 170	behind mountains (?)					
Box 56	F 171	behind mountains (?)					
Box 56	F 172	behind mountains (?)					
Box 56	F 173	behind mountains (?)					
Box 56	F 174	behind mountains (?)					
Box 52	F 175	from behind *Shijiamouni* EN 4.3		cloud with red and green part, without tail			
Box 60	F 176	cloud behind *Shijiamouni* EN 4.3		cloud with green and with part, without tail			
Box	F 177	cloud behind *Shijiamouni* EN 4.3		cloud with green and red part, tail complete, but broken			

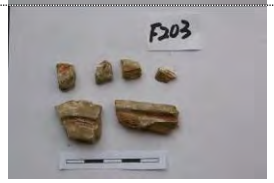
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 52	F 178	mountain top, standing loose behind *Shijiamouni* EN 4.3, at the right to the cantilever		mountain top			
Box 53	F 179	found on the floor, right side		three parts of green *piaodai* from *tianwang*			
Box 62 box 53	F 180 from F 180	found at EN 4.13 during vacuum cleaning		three small fragments red *piaodai*?			
Box 62	F 181	found on the floor, 2011-11-11		tip of strand of hair ?, from *tianwang* on the right side of the wall?			
----	F 182	found on the wall ? behind *tianwang* ?		part of *piaodai*, maybe from EN 4.20		re-attached in Aug. 2012 to *piaodai* below his right arm	
Box 59	F 183	behind GN 7.19 b, inside GN wall		peg, either from GN 7.19 b or from the lost mountain behind it			
Box	F 184-1	behind *baoshen fo*, found during vacuum cleaning		2. fragment 1: part of the sword of EN 4.12		F 184-1. re-attached in Aug. 2012	
Box 62	F 185	found at left foot of EN 4.20		several small fragments, probably from connection of wall to sculpture			

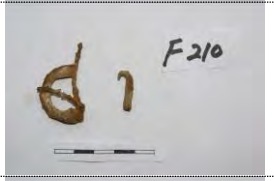
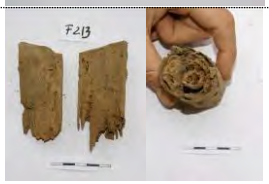
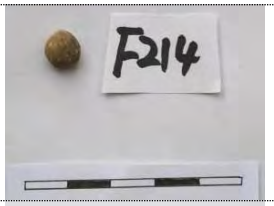
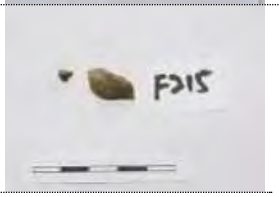
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box	F 186	on the lap of *baoshen fo*		from canopy ?			
Box	F 187	found behind *pusa* 4.22, 2011-11-11		wire			
Box 62	F 188	found behind *pusa* 4.22		part of decoration of bead chain, probably from crown of 4.22			
Box 59	F 189	between GN 7.19 a and mountain on his right side		parts taken out to get GN 7.19 a back into the right position. Not painted			
Box 62	F 190	from 4.19		part of *piaodai* ?			
Box	F 191	taken out when repairing the *piaodai* of EN 4.20		part of broken wire from *piaodai* at waist of EN 4.20			
----	F 192	detached when gluing the *piaodai* around head of 4.13		part of *piaodai* around head of 4.13		re-attached in Aug. 2012	
Box	F 193	4.19		part of hair of 4.19		could not be re-attached	
--- wires in box 62	F 194	detached from canopy center		bead chain, hanging decoration		center of canopy re-attached in Aug. 2012	

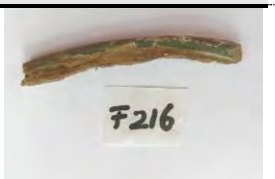
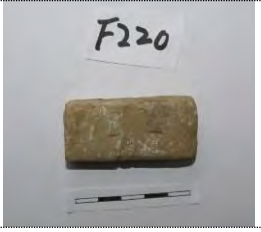
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
---- wires in box 62	F 195	detached from *pusa* 4.22		decoration of crown		his left side re-attached in Aug. 2012	
Box 54	Y 7	detached from wall		cloud, nailed to wall in 1980-85			
----	*fei tian* EN 4.5	detached from wall				re-attached in Aug. 2012	

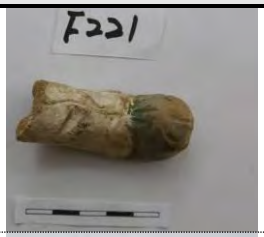
Findings discovered underneath and behind *pusa* EN 4.21 in 2012

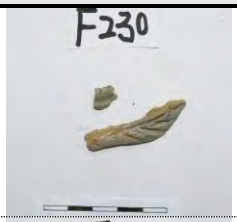
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position*	*photograph*
Box 51	F 196	behind *pusa* EN 4.21		gilded hat of a small figure; broken into two parts		GN wall	
Box 51	F 197	behind *pusa* EN 4.21		9 fragments of a gilded ornament ; glued together		GN wall after gluing:	 
Box 62	F 198	behind *pusa* EN 4.21		two gilded pendants		a lost bead chain pendant; EN wall, canopy of *baoshen fo*, or GN wall ?	

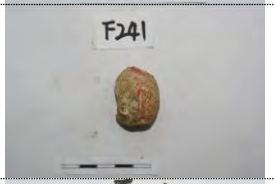
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 51	F 199	behind *pusa* EN 4.21		four gilded fragments			
Box 62	F 200	behind *pusa* EN 4.21		2 coiled elements from hats or crown, one red, the other gilded		probably EN wall	
Box 62	F 201	behind *pusa* EN 4.21		6 halves of beads		EN wall, canopy of *baoshen fo*, or GN wall ?	
Box 62	F 202	behind *pusa* EN 4.21		2 fragments of hair strands			
Box 54 Box 53	F 203 cloud s From F 303	behind *pusa* EN 4.21		6 fragments of red-and-white clouds *piaodai*		EN wall	
Box 53	F 204	behind *pusa* EN 4.21		5 small fragments of red *paiodai*		EN wall	
Box 53	F 205	behind *pusa* EN 4.21		26 small fragments of green *piaodai*, two of them with a wire core		EN wall; one of the fragments attached to a fragment from F 34 four fragments reconnected	  
Box 62	F 206	behind *pusa* EN 4.21		5 fragments of *piaodai* without paint layer			

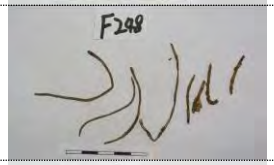
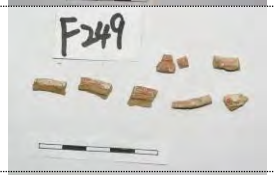
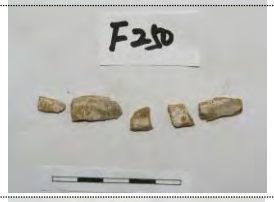
storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
----	F 207	behind *pusa* EN 4.21		2 fragments of *piaodai* with green paint layer and gold on top		re-attached in the *piaodai* around the head of EN 4.11	
Box 62	F 208	behind *pusa* EN 4.21		13 small fragments which could not be identified			
Box 62	F 209	behind *pusa* EN 4.21		5 small gilded fragments			
Box 62	F 210	behind *pusa* EN 4.21		2 fragments with wire core: 210-1: a bow-shaped element 210-2			
Box 62	F 211	behind *pusa* EN 4.21		part of a twig with a leaf		GN wall, monk GN 7.19 or *pusa* EN 4.21, attribute in his hands?	
Box 62	F 212	behind *pusa* EN 4.21		- round object - ancient glass shard			
Box	F 213	corner behind the *pusa* 4.21, imbedded loosely in the debris		deteriorated wooden peg, made of a branch; broken into two halves			
Box	F 214	detached from central arm of canopy in Aug. 2012		half a bead		EN wall, central arm of canopy attached?	
---	F 215	detached in Aug. 2012		coiled element		crown of pusa EN 4.22	

storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 53	F 216	behind *pusa* EN 4.21	2012-8-21	fragment of green *piaodai*, can be attached to F 60			
Box 53	F 217	behind *pusa* EN 4.21	2012-8-21	19 fragments of green *piaodai*, 2 times 2 can be assembled		two parts re-attached to right shoulder of EN 4.11	
Box 53	F 218	behind *pusa* EN 4.21	2012-8-21	27 fragments of green *piaodai*,			
Box 53	F 219	behind *pusa* EN 4.21	2012-8-21	46 fragments of green *piaodai*, 2 fit together			
Box 51	F 220	behind *pusa* EN 4.21	2012-8-	scroll, white		EN or GN, from the hand of a monk	

storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 51	F 221	behind *pusa* EN 4.21	2012-8-	foot with black monk's shoe, and green at the top of the shoe		GN wall	
Box 51	F 222	behind *pusa* EN 4.21	2012-8-	white cloth which covered two hands		GN wall	
Box	F 223	behind *pusa* EN 4.21	2012-8-	large coiled element, gilded		GN wall, *jingang* ?	
Box 51	F 224	behind *pusa* EN 4.21	2012-8-	lotus leaf, outside red, inside partially grey priming			
Box 51	F 225	behind *pusa* EN 4.21	2012-8-	stick-shaped element, green		?	
Box 51	F 226	behind *pusa* EN 4.21	2012-8-	stick-shaped element like F 225,but unpainted		?	
Box 51	F 227	behind *pusa* EN 4.21	2012-8-	right ear, reddish brown			
Box 51	F 228	behind *pusa* EN 4.21	2012-8-	fragment of a right ear, reddish brown			
Box 51	F 229	behind *pusa* EN 4.21	2012-8-	two reddish brown fragments, maybe from an ear			

storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 62	F 230	behind *pusa* EN 4.21	2012-8-	two fragments of leaves			
Box 62	F 231	behind *pusa* EN 4.21	2012-8-	two fragments of *piaodai* or collar			
Box 62	F 232	behind *pusa* EN 4.21	2012-8-	two fragments, maybe hair strands			
Box 62	F 233	behind *pusa* EN 4.21	2012-8-	4 coiled decorations of headgear, one is red			
Box 51	F 234	behind *pusa* EN 4.21	2012-8-	eight fragments of a decoration		GN wall, *jingang*	
Box 53	F 235	behind *pusa* EN 4.21	2012-8-	black fragments of *piaodai* or hair			
Box 62	F 236	behind *pusa* EN 4.21	2012-8-	four fragments, gilded, slightly curved			
Box 62	F 237	behind *pusa* EN 4.21	2012-8-	12 fragments of *piaodai*, not painted			
Box 62	F 238	behind *pusa* EN 4.21	2012-8-	peach or blossom and fragment of a fruit or blossom		GN wall or *pusa* EN 4.21	

storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 62	F 239	behind *pusa* EN 4.21	2012-8-	eight fragments of *piaodai* ?, partially or completely gilded			
Box 51	F 240	behind *pusa* EN 4.21	2012-8-	small animal (lion ?) without head, gilded		GN wall (?)	
Box 62	F 241	behind *pusa* EN 4.21	2012-8-	rounded fragment, painted red and white			
Box 62	F 242	behind *pusa* EN 4.21	2012-8-	three fragments of larger beads			
Box 62	F 243	behind *pusa* EN 4.21	2012-8-	three fragments of bead chain pendants: 1 complete bead 2 bead on a wire 1 bead on a wire			
Box 62	F 244	behind *pusa* EN 4.21	2012-8-	17 fragmented beads			
Box 53	F 245	behind *pusa* EN 4.21	2012-8-	5 fragments of green *piaodai* (one may be a leaf)			
Box 54	F 246	behind *pusa* EN 4.21	2012-8-	part of cloud tail, red-white			

storage place (box no.)	*fragment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 62	F 247	behind *pusa* EN 4.21	2012-8-	two small spiral decorations and a small white object			
Box 62	F 248	behind *pusa* EN 4.21	2012-8-	eight fragments of wire			
Box 53	F 249	behind *pusa* EN 4.21	2012-8-	eight fragments of *piaodai*, dark red			
Box 53	F 250	behind *pusa* EN 4.21	2012-8-	five fragments of *piaodai*, white			
Box 53	F 251	behind *pusa* EN 4.21	2012-8-	six fragments of *piaodai*, red			
Box 54 (with clouds)	F 252	behind *pusa* EN 4.21	2012-8-	15 fragments of clouds or *piaodai*, red-white			
Box 53	F 253	behind *pusa* EN 4.21	2012-8-	seven fragments of *piaodai*, red			
Box 53	F 254	behind *pusa* EN 4.21	2012-8-	two fragments of *piaodai*, bright green			

storage place (box no.)	*frag-ment no.*	*place of finding*	*day of finding*	*description*	*max. dimension. (cm) l x w (x d)*	*original position/ treatment*	*photograph*
Box 62	F 255	behind *pusa* EN 4.21	2012-8-	two larger fragments with traces of priming layer			
Box 53	F 256	behind *pusa* EN 4.21	2012-8-	many small fragments, mainly without paint layer			
----	F 257	behind *pusa* EN 4.21	2012-8-8	red *piaodai*		re-attached to the right shoulder of EN 4.21	
Box 53	F 258	behind *pusa* EN 4.21	2012-8-8	green *piaodai*, like F 257, consisting of six parts		assembled and glued together	
---	F 259	behind *pusa* EN 4.21	2012-8-	part of cloud from 1981-85		re-attached to *shijia-mouni's* cloud base	
Box 52	F 260	behind *pusa* EN 4.21	2012-8-	foot/stand from the pole inside pusa EN 4.21			

Bericht über den Aufenthalt im Shuilu'an, 8. Oktober bis 18. November 2011
Konservierung der Nordeite der Ostwand der Shuilu-Halle, Tagesprotokoll

Teilnehmer:

Deutsche Seite	*Chinesische Seite*
Catharina Blänsdorf, TUM	Yang Qiuying, Projektleiterin
Maximilian Knidlberger	Gao Yan
Stefan Demeter	Wang Yang (Student), Liang Qing (Studentin)
	zeitweise: Yan Min, Cai Bo

Fr., 7. 10.
Abflug C. Blänsdorf nach Xi'an.

Sa, 8. 10.
Ankunft C. Blänsdorf um 10.20. Mittagessen mit Bai Chongbin. Nachmittags im Zentrum. Frau Yang Qiuying ist noch nicht wieder zurück, weil sie kein Zugticket mehr bekommen konnte. Sie hat einen kurzen Bericht über die Situation der Wände verfasst, der als Grundlage für weitere Diskussionen dient.

So, 9. 10.
Fahrt zum Shuilu'an mit Yan Min, Gao Yan, Zhen Gang und Cai Bo. Erste Begutachtung der beiden Abschnitte der Ostwand vom Gerüst aus. Am Abend entscheidet Bai Chongbin, dass die Nordseite (EN-Wand) bearbeitet werden soll.
Neben dem Shuilu'an wird eine neue Straße gebaut, die nach Norden, Richtung Weinan, führen soll. Im Tempel hängen noch immer die Pläne zur Umgestaltung der Anlage in einen Disneyland-ähnlichen Erlebnispark, ähnlich dem Museum der Terrakottaarmee oder Famensi (wenn auch kleiner), und die Straße sieht aus, als wäre sie der Anfang zur Umsetzung dieses Plans. Im Tempel wird gerade eine aufwendige neue Überwachungs-, Beschallungs- und Beleuchtungsanlage installiert. Abgesehen von gelegentlichen internen Stromausfällen hat dies in den kommenden Wochen eine nette Zusammenarbeit mit den Elektrikern zur Folge, die bereitwillig Leitern und Werkzeug verleihen und eine weitere, temporäre Stromversorgung legen, um eine Überlastung der Sicherung in der Halle zu vermeiden.

Mo, 10. 10.
Als Gast ist an diesem Tag Angela Eysler, Masterstudentin an der Hochschule der Künste Bern, dabei. Shuilu'an: Planung mit Gerüstbauer Ma Xifeng für die Aufstellung des Gerüsts vor der Nordseite der Ostwand. Gesamtaufnahmen und einige Details beider Wände. Anschließend Besprechung über Probenuntersuchung von Ziyang mit Herrn Bai Chongbin im Zentrum für Konservierung.

Di, 11. 10. und Mi, 12. 10.
Kein Arbeitsprogramm. C. Blänsdorf bereitet Übergabe des Berichts 2010 vor (am Ende des Aufenthalts an Gao Yan übergeben.).

Do, 13. 10.
Ankunft M. Knidlberger und S. Demeter um 11:45 mit 90 Minuten Verspätung. Mittagessen mit Yang Qiuying, Cai Bo, Gao Yan und Wang Yang (Student) im Hotel. Nachmittag im Zentrum für Konservierung: Überprüfen und Bereitstellen der Materialkisten, die aus Ziyang zurückgeschickt worden sind.
Überprüfung der letzten Klimamessungen im Shuilu'an durch Yan Min und C. Blänsdorf.
Abendessen in einem Gartenrestaurant in der *Keji wu lu* mit Yan Min und den deutschen Kollegen.

Fr, 14. 10.
Yang Qiuying, Yan Min, Gao Yan, Wang Yang, Blänsdorf, Knidlberger, Demeter. 10:30-12:50, 14:00-18:00
Da in den letzten beiden Tagen Stromausfall war, ist das Gerüst noch nicht aufgestellt. Der Gerüstbauer Ma Xifeng fängt an, das Gerüst aufzubauen. Cai und Wang fotografieren auf Anweisung von Frau Yang an diversen Wänden. Als das Gerüst halb steht, untersuchen sie mit dem Endoskop die Nordwestecke und den oberen Teil der EN-Wand. Dabei entdecken sie vier Porzellanschälchen (blau-weiss). Ma Xifeng und Zhao Liang meinen, sie wären als Öllämpchen benutzt worden, aber sie sind ziemlich sauber. Um 6 Uhr ist das Gerüst noch nicht fertig.
Gemeinsames Abendessen mit Gerösteter Ente in Xi'an nahe der Da Yanta.

Sa, 15. 10.
Frei: Fahrradtour auf Stadtmauer; Stadtgott-Tempel und Hui-Viertel

So, 16. 10.
Frei: Baxian'an-Flohmarkt, Glaswaren in Läden für Laborbedarf gekauft.

Mo, 17. 10.
Gao Yan, Wang Yang, Blänsdorf, Knidlberger, Demeter. 11:00-12:50, 14:30-18:00
Verspätete Abfahrt wegen Auffahrunfall. Aufnahme der Schadenssituation im oberen Bereich der Wand, während Wang Yang die Schäden an den Skulpturen erfasst. Knidlberger und Demeter untersuchen Rückseite des Gebirgsreliefs, Blänsdorf die Vorderseite und die Befestigung der Figuren.

Di, 18. 10.
Gao Yan, Wang Yang, Blänsdorf, Knidlberger, Demeter. 11:00-12:50, 14:00-18:00
Verspätete Abfahrt durch Verzögerung in Xi'an.
Beginn vergleichender Klimamessungen mit Thremohygromtern. Beginn der Reinigung hinter dem Gebirgsrelief mit Staubsauger durch Demeter und Knidlberger. Blänsdorf setzt Dokumentation der Schadenssituation des Reliefs fort.

Mi, 19. 10.
Stromausfall: Im Shuilu'an kann man nicht arbeiten. Als Alternativprogramm Besuch des Museums der Terrakottaarmee des Qin Shihuang.

Do, 20. 10.
Yang Qiuying, Yan Min, Gao Yan, Wang Yang, Blänsdorf, Knidlberger, Demeter. 10:30-13:00, 15:00-18:15
Besichtigung der Baustelle durch Frau Yang mit Anweisungen zur Verbesserung der Einrichtung. C. Blänsdorf und Frau Yang besprechen einige Fragen, darunter das Ausmaß von Ergänzungen und den Umgang damit.
S. Demeter und M. Knidlberger setzen die Reinigung mit Staubsauger fort. Wang Yang zeichnet und dokumentiert Schäden an den Skulpturen.
Um die Mittagszeit kommen Herr Direktor Zhang und der neue Vizedirektor (Parteisekretär) Hr. Bi. Er hat früher im Denkmalamt gearbeitet, in der Abteilung, die für Museen zuständig ist. Gemeinsames Mittagessen im Shuilu'an-Restaurant, anwesend ist auch der Tempeldirektor.
Bananenkisten für Fundstücke besorgt. Dokumentation der Wandschäden fortgesetzt.

Fr, 21. 10.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter. 10:15-13:00, 14:30-18:15
Eine Mitstudentin von Wang Yang, Liang Qing, kommt mit und arbeitet ab jetzt mit.
Oberer Teil der Wand von vorne fertig abgesaugt. Beide *feitian* abgenommen, ebenso die Lehmklötze von 1985 dahinter. Wolken hinter *shijiamouni* EN 4.3 abgenommen. Konsole

unter Brett von außen entfernt und Brett gelockert, so dass man es Montag herausnehmen kann. Gehänge am Baldachin mit Gaze geschützt.
Staub und lose Erde zwischen *Boddhisattva* EN 4.21 und Sockel des *baoshen fo* herausgenommen, ebenso zwischen dem letzten *jingang* der nördlichen Giebelwand und dem Sockel. Daraus zahlreiche kleine Fundstücke geborgen, überwiegend aus dem Staub bzw. Lehm ausgesiebt.

Sa, 22. 10.
Frei: Knidlberger und Demeter: Historisches Museums

So, 23. 10.
Frei: Straße mit Läden für Künstlerbedarf, Antikmarkt in der Halle in der *Zhuque lu*

Mo, 24. 10.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter. 10:40-23:00, 14:00-18:00
Knidlberger nimmt das Brett heraus. Demeter: Untersuchung der Situation des Gebirgsreliefs; Knidlberger und Demeter: bringen Stahlseilsicherung um *kongzi* EN 4.2 an.
Berg hinter *shijiamouni* EN 4.3 und weitere Wolkenstücke abgenommen.
Blänsdorf: Dokumentation der Drähte von 1981-85, Diskussion des Arbeitsprogramms von Frau Yang für die EN-Wand mit Gao Yan.
Wang und Liang beginnen fotografische Erfassung der Fundstücke.

Di, 25. 10.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter. 10:00-12:50, 14:00-18:00
Untersuchung der Befestigung des *shijiamouni* EN 4.3. Knidlberger und Demeter setzen Sicherung mit Stahlseilen fort.
Blänsdorf: Beginn der Festigung von herausgenommenem Berg hinter *shijiamouni* EN 4.3, Bergspitze aus Lehmmasse der 1981-85 auf dem Berg angeklebten Wolke herausgenommen und stückweise wieder angeklebt.

Mi, 26. 10.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter. 9:30-12:45, 14:30-18:00
Blänsdorf: Test für Lehmmasse mit Bimsmehl, fein. Testkörper in 5 cm-Ring eingespritzt, Untergrund Pappe. Verklebung weiterer Stücke an dem herausgenommenen Berg, Oberflächenreinigung mit Abnahme von Lehmspuren von 1981-85 mit feuchtem Blitzfix-Schwamm. Vor dem Berg montierte Wolke geklebt.
Knidlberger und Demeter setzen Sicherung mit Stahlseilen fort.

Do, 27. 10.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter. 9:20-13:00, 14:20-18:00
Knidlberger und Demeter setzen die Sicherungen mit Drähten im Bereich des Gebirges fort: Sicherung von *Laozi* EN 4.4 fertiggestellt. Berg hinter EN 4.13 gesichert. Kittungen in den Bergen am rechten Ende der Wand reduziert (unterhalb von EN 4.23). Kittung hinter S11 herausgenommen. Angenagelte Wolke Y7 abgenommen, die nicht an diesen Platz gehört.
Wang und Liang fotografieren alle Fundstücke und alle abgenommenen Teile. Blänsdorf: Klebung von hinter dem *shijiamouni* EN 4.3 herausgenommenem Bergstück fertiggestellt. Klebung von Wolke Y7 begonnen. Zuordnung von Einzelteilen und Erstellung von Fundliste.

Fr, 28. 10.
Gao Yan, Cai Bo, Blänsdorf, Knidlberger, Demeter. 9:45-13:00, 14:00-18:00
Figur EN 4.1 abgenommen, nachem sich der Dübel gelockert hatte. Konservierung der Rückseite, des ausgebrochenen Dübellochs und der rechten Ärmelkante. Konservierung von *feitian* EN 4.5 begonnen. Anbringung an Berg noch unklar, da Anschluss verloren.

Lehmmassen für Strohlehm und Hanffaserlehm angesetzt. Test mit Bimsmehl ist getrocknet. Keine Schrumpfungsrisse, klebte nicht an Pappe. Mechanisch fester als Hohlglaskügelchenmasse.

Sa, 29. 10.
Frei: Fahrt zum Lackhändler Yang Hanzhu in einem südlichen Vorort von Xi'an (südlich von Guodu, in der Naehe der *Chang'an dianzi keji daxue*). Es gibt gefilterten Rohlack und entwässerten Lack.

So, 30. 10.
Frei: Besuch von HanYangling

Mo, 31. 10.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter.
Kein Strom im Shuilu'an. Konservierung von Figuren im Innenhof bei Sonnenschein.

Di, 1. 11.
Blänsdorf, Knidlberger, Demeter, 10-13:30, 14:30-
Kein Strom im Shuilu'an. Arbeit an Bericht, Schadenskartierung mit *Metigomap* im Zentrum für Konservierung.

Mi, 2. 11.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter. 10:00-13:00, 14:15-18:00
Zuerst und zwischendurch kein Strom: Deswegen Kleben von *feitian*, Wolken und Fundstücken im Hof (Wolken F2, F3, Y7, diverse kleinere Stücke: F15, 19, 4, 54, zwei Bruchstücke aus F6 und F35 zusammengeklebt).
Nachmittags saugt Liang Qing die Wand ab (unter Gebirge bis unten). Wang Yang kartiert Risse unter EN 4.23. Figur EN 4.7 als Vorbereitung trocken eingepasst.
Abends Einladung zum Essen durch die chinesischen Kollegen.

Do, 3. 11.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter. 10:15-13:00, 14:15-18:15
Demeter und Knidlberger bereiten den Mönch EN 4.7 für die Montage vor: Anbringen der Zusatzsicherungen und Entwicklung der temporären Fixierung mit Schnüren.
Blänsdorf beginnt, Kleinteile an den Figuren EN 4.12, 4.13 4.19, 4.20 zu kleben, vor allem *piaodai*. Dabei fallen das Band über dem Kopf von EN 4.14 und die Perlenschnurdekoration von der Krone des *pusa* EN 4.22 ab, weil die Drähte komplett korrodiert sind.

Fr, 4. 11.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter. 9:30-13:00, 14:15-18:15
Zuerst kein Strom, Arbeit mit Taschenlampen.
Demeter und Knidlberger bringen den Mönch EN 4.7 wieder an.
Blänsdorf klebt gebrochene Fundstücke, dann Kleinteile an den Figuren EN 4.12, 4.13 und 4.14, vor allem *piaodai*: linker Arm von EN 4.13 hinterspritzt. Wang Yang klebt kleine Teile von Wolken und Bergen um EN 4.14.

Sa, 5. 11.
Frei: Einkaufen und Besichtigung in der Innenstadt von Xi'an (Grosse Moschee, Kathedrale, Chemieläden).
Abends Einladung durch Rong Bo und Familie zum Feuertopfessen ins Restaurant und anschliessend zu ihnen nach Hause.

So, 6. 11.
Frei: Besuch von Famensi bei starkem Regen, wo mittlerweile eine enorme „Aufmarschmeile" Richtung Kloster entstanden ist, so dass man vom Eingang bis zum Kloster eine halbe Stunde laufen muss. In einem riesigen, kitschigen Gebäude wird der „echte" Fingerknochen als Reliquie ausgestellt.

Mo, 7. 11.
Gao Yan, Wang Yang, Liang Qing, Cai Bo, Yan Min, Yang Qiuying, Blänsdorf, Knidlberger, Demeter. 10:00-14:20, 16:20-18:10
Vormittags Expertenkonferenz im Shuilu'an, zu der Frau Yang und Hr. Bai kommen. Als Experten sind anwesend: Kong Yu und ein Mitarbeiter vom Denkmalamt Shaanxi, eine Mitarbeiterin vom Denkmalamt Xi'an, Frau Wang von der *Xibei daxue*, Herr Li von der Pädagogischen Hochschule Xi'an, Hr. Zhou Tie und Huang Jianhua, Museum der Terrakottaarmee des Qin Shihuang.
Die deutschen Restauratoren nehmen nicht an der Konferenz teil. Demeter und Knidlberger montieren *feitian* EN 4.6 an die Wand, nachdem die Berge hinter beiden *feitian* gefestigt sind.
Blänsdorf: *piaodai* um den Kopf von EN 4.14 zusammengeklebt und an die Figur montiert.
Liang klebt Fundstücke. Nachmittags beginnen die chinesischen Kollegen, die Fundstücke in neu gekaufte Schachteln zu verpacken.

Di, 8. 11.
Gao Yan, Wang Yang, Liang Qing, Cai Bo, Yan Min, Yang Qiuying, Blänsdorf, Knidlberger, Demeter. 10:00-13:00, 14:00-17:30
GN 7.19b wieder an der Wand eingesetzt, dabei auch GN 7.19a neu befestigt und Position leicht korrigiert.
Begonnen, Berg S 11 aufzurichten. Wolke über dem Kopf von *kongzi* wieder angebracht.
Risse in S 30 neben EN 4.23 ausgespritzt. Kopf von EN 4.23 gefestigt. Kleinteile an Krone von EN 4.23 zurechtgebogen und gefestigt. EN 4.23: *piaodai* zwischen rechtem Arm und Hüfte begonnen zu festigen, *piaodai*-Ring vor dem Bauch abgefallen: in sich stabilsiert.
Aus einer Vorratsstelle „nahe der Strasse" lässt Zhao Liang Lehm holen, angeblich „schwarze Erde vom Berg", die jedoch etwas heller und gelber ist als die von 2009. Cao Bo zerkleinert die Erde und siebt einen Teil vor, setzt Strohlehm an.

Mi, 9. 11.
Gao Yan, Blänsdorf, Knidlberger, Demeter. 10:00-13:10, 14:00-18:00
Drähte am *shijiamouni* entfernt. Position von *feitian* EN 4.5 erprobt (noch nicht endgültig festgelegt). Berg S 11 gerade gerückt und mit Ausspritzen und Kitten gefestigt. Diskussion mit Gao Yan über geeignete Zusätze in Lehmhinterfüllmasse und Lehmklebemasse, besonders über die Verwendung von *mingjiao* (Hautleim).
Beginn der Hinterspritzung an der südlichen Wandkante neben EN 4.20. Baum auf S 4 aufgesetzt.

Do, 10. 11.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter. 10:40-13:00, 14:00-18:00
Seitliche Arme des Baldachin geklebt. Demeter befestigt den rechten Teil des *piaodai* des Baldachins neu, klebt *piaodai* um den Kopf von EN 4.9 und 4.13. Knidlberger klebt Baum auf S 10, sichert Berge S 11 und S 33. Er sichert die Pagode an der ES-Wand mit einem Seil.

Fr, 11. 11.
Gao Yan, Wang Yang, Liang Qing, Blänsdorf, Knidlberger, Demeter. 9:30-13:00, 14:20-18:00
Demeter und Knidlberger beenden ihre Arbeit, ihre Dokumentation und die Kartierung. Fehlende Modellierung auf der Rückseite der Berge in der nördlichen Wandhälfte mit Strohputz ergänzt. Das herausgenommene Brett (10) wird wieder eingesetzt, aber nur provisorisch (geschraubt), damit es für die Montage von *feitian* EN 4.5 wieder herausgenommen werden kann. Materialliste der neu gekauften Dinge, vor allem für die Fixierung mittels Stahlseilen, erstellt und fehlende Materialien notiert. Ein Teil des Materials wird gepackt und mit ins Zentrum genommen. Gao Yan wäscht die Beutel vom Feinfilter des Staubsaugers.

Sa, 12. 11.
Frei: Fahrt zum Huashan

So, 13. 11.
Frei: Nach Abschiedsessen Abreise von Demeter und Knidlberger

Mo, 14. 11.
Gao Yan, Cai Bo, Yan Min, Blänsdorf. 10:15-13:00, 14:00-18:00
Blänsdorf und Yan Min kleben die mittleren Arme des Baldachin und verschiedene kleine Teile an den Figuren EN 4.12-4.14, Haarsträhne und Finger von EN 4.19, die Bergecke hinter *laozi* EN 4.4, in die der Draht eingeschnitten hatte, und den Rest des *piaodai* an der Schulter des *shijiamouni* EN 4.3.

Di, 15. 11.
Yang Qiuying, Gao Yan, Cai Bo, Yan Min, Blänsdorf,
Cai Bo klebt die Hand von EN 4.22. Blänsdorf und Yan Min kleben *piaodai* an EN 4.9, 4.11, 4.19 und 4.20. Staubsaugerfeinfilter neu aufgezogen.

Mi, 16. 11.
Gao Yan, Cai Bo, Yan Min, Blänsdorf,
Gao Yan: Finger der rechten Hand des *baoshen fo* geklebt.
Yan Min festigt Kleinteile, Perlen am Perlengehänge des Baldachin. Mittlerer Teil des Perlengehänges abgenommen, da Hanffasern kaum noch halten. Das zerbrechende Perlengehänge wird eingelagert. Drachenkopf F 1 geklebt, leider ohne Isolierung des Drahtes, da auf die Schnelle kein Paraloid mehr zu beschaffen ist.

Do, 17. 11.
Gao Yan, Cai Bo, Yan Min, Blänsdorf,
Die chinesischen Kollegen verpacken die Fundstücke und deponieren sie zusammen mit Zhao Liang im südlichen Anbau. Diskussion mit Zhao Liang um erfolgte und noch fehlende Massnahmen. Er erzählt, dass nächstes Jahr in einem der Nebenräume ein kleines Museum mit Fundstücken eröffnet werden soll.

Fr, 18. 11.
Blänsdorf, 9:30-12:00, 12:30-17:00
Aufräumen der Materialkisten. Austausch der Fotos mit Gao Yan. Gespräch über Ziyang und Probenuntersuchung mit Bai Chongbin. Abends Abschiedsessen.

Sa, 19. 11.
Um 17:00 Abfahrt zum Flughafen. Beide Flüge haben Verspätung. Der Flug von Beijing nach München hat sieben Stunden Verspätung und kommt am 20. 11. um 12 Uhr in München an.

Work visit in the Shuilu hall, August 6 to August 30, 2012

Aim of work:
Finish the conservation of the EN wall, including:
- tests for improvement of grouting and gluing mixtures
- lifting pusa EN 4.21
- conservation of fragmented beaded chain pendants

Participants:

German conservators
Catharina Blänsdorf, TUM
Stefan Demeter
Daniel Scherzer

Chinese conservators
Gao Yan
(Yang Qiuying, head of project)

Fri, Aug. 3
Miriam Schanz and C. Blaensdorf visit the Shuilu'an

Mon, Aug. 6
13:00-18:00
During the weekend Stefan Demeter and Daniel Scherzer have arrived in Xi'an. In the Shuilu hall, the scaffold has been set up by Ma Xifeng in front of the EN wall, so the work can start immediately.
Fitting out the place of work. A check of the situation reveals the accumulation of considerable amounts of dust on the upper parts of the wall including the wires and excrements of rodents (rats?).
From Monday to Friday, the team lives in Lantian (*Lantian bingguan*), during the weekend in Xi'an.

Tue, Aug. 7
9:20-18:00
No power, but the new generator in the garden provides energy all day long (and the following days).
Dusting off of the EN wall with soft brushes and vacuum cleaner.
Feitian EN 4.5 is taken from the storage room.
Start of tests for grouting mixtures (tests 1 and 2).

Wed, Aug. 8
8:50-18:00
The *feitian* is prepared for re-attaching by gluing the parts which have been broken again (arm, head, *piaodai*). One tip of a feather has got lost since last year.
Tests for grouting mixtures (test 3 [*ming* jiao]
Check of the situation at *pusa* EN 4.21 which has sunk through the broken surface of the dais.
S. Demeter and D. Scherzer start to re-attach loose and broken parts on the wall.

Thu, Aug, 9
9:30-18:00
Tests for mixtures for re-attaching broken parts
For the isolation of broken parts, a solution of Paraloid B 48 N is prepared: 20 % in ethyl acetate (for the use later on diluted to approx. 15 %).

We continue to re-attach and consolidate broken parts. In the evening we look for a blacksmith in Lantian and, after having finally managed to find one, we order two iron poles for re-attaching the *feitian*.

Fri, Aug. 10
9:30-16:00
Tests for mixtures for re-attaching broken parts and grouting mixtures continued
Preparation of *feitian* for re-attachment is finished.
The boxes with the findings picked up in 2011 are taken from the storage room.
In the afternoon we go to the blacksmith to pick up the two poles we ordered the day before. As the cross section is too big (8 x 8 instead of 6 x 6), the poles have to be adjusted what takes a while.

Sat, Aug. 11
Free day in Xi'an. Purchase of sieves, bottles and glass bottles.

Sun, Aug. 12
Free day in Xi'an.

Mon, Aug. 13
10:00-18:00
Preparation for re-attaching the *feitian*: Cutting the rod to the right length and creating hooks. Unpacking findings. Evaluation of grouting tests.
In the afternoon the *feitian* is re-attached to the wall.

Tue, Aug. 14
9:00-18:00
A gap has opened at the joint of the filling of the hole in the back of the *feitian* due to shrinkage of the material. The gap is closed by adding clay mixture.
Zhao Liang is back. Discussion about planned fire extinction system with nitrogen.
Arrangement of findings in groups, starting to assemble them.

Wed, Aug. 15
9:00-18:00
More findings from the hole underneath *pusa* EN 4.21 are retrieved. The new findings are catalogued, arranged in groups. We continue to glue fragmented or broken findings.
We continue to glue and re-attach broken parts to the wall (*tianwang*).

Thu, Aug, 16
9:00-18:00
We continue to reassemble fragmented findings. Some findings are re-attached to the wall.
F 194: We start to remove broken iron wire.

Fri, Aug. 17
9:00-16:00
We continue to reassemble fragmented findings, to re-attach findings to the wall and to glue broken parts to the wall. In the evening (18:00) bus to Ziyang.

Sat, Aug. 18
Visit to Ziyang and the team working in the *beiwusheng huiguan*. Tour to Shiquan where there is another *huiguan* (*Jiangxi huiguan*), a city wall and a street with old houses between the east and the west gate. In the evening KTV.

Sun, Aug. 19
Visit of the Liujiazhuang and the tea plantation near Wafang. Return to Xi'an in the afternoon.

Mon, Aug. 20
10:00-18:00
We continue to glue broken findings, to reassemble fragments from the findings and to isolate all corroded wires with Paraloid B 48 N.
The restoration of beaded chain pendants (F 105, F 194, F 195) is continued. Examination of the construction of the other beaded chain curtains (mainly above the *Amitabha* because the ones above the other figures are very fragmented) and small pendants at the gable wall. Fragment F 194 is not of the same type as the beaded chain pendants at the gable walls, but also not like the preserved one on the canopy of the *baoshen fo* as these all do not include the ball-shaped ornament. The original position thus remains uncertain.

Tue, Aug. 21
9:25-18:00
Material ordered and organized for lifting the *pusa*.
We continue to glue broken *piaodai* to the wall (*tianwang*) and to restore fragments of beaded chain pendants.

Wed, Aug. 22
9:00-18:00
We continue to glue broken *piaodai* to the wall (*tianwang*) and to restore fragments of beaded chain pendants.
Preparations to lift *pusa* EN 4.21 with a pulley attached to the scaffold.

Thu, Aug, 23
9:00-18:00
We continue to glue broken *piaodai* on the wall (*tianwang*) and to restore fragments of beaded chain pendants.
Lifting of *pusa* EN 4.21. Removal of debris of adobe bricks, wall and repair plasters from hole, bricks are taken out. More fragments of the clay modeling are retrieved from the debris. We start to fill the hole underneath the *pusa* again.
In the evening meeting with Mr. Tian who photographed the Shuilu'an in the late 1970's, before the restoration of 1981-85 and afterwards.

Fri, Aug. 24
9:00-18:00
Grouting of the wall behind the pusa EN 4.21.
Pusa EN 4.21 is set down and installed in his new position. The dais is built up with small stones from the river and adobe bricks. 1st step of filling the gaps between the adobe bricks. Removal of the belt.
We continue to restore fragments of the bead chain pendants.

Sat, Aug. 25
Visiting tour to Han Yangling and Maoling together with Linda Zachmann and Charlotte Höpker who are working in Lintong. Invitation to a beer garden and afterwards dancing.

Sun, Aug. 26
Visiting Xi'an.

Mon, Aug. 27
10:30-18:00
The space around the pole of *pusa* EN 4.21 is filled. Second application of clay mortar at the gaps between the adobe bricks (morning). First layer of clay straw plaster on top of the dais (afternoon).
The restoration of beaded chain fragments F 105, F 194 and F 195 is continued.

Tue, Aug. 28
9:00-18:00
Grouting of voids behind *pusa* EN 4.22.
We continue to glue and stabilize broken parts of the *tianwang*.
The space between pedestal of *pusa* EN 4.21 and dais is filled. Second layer of clay straw plaster on top of the dais.
In the evening meeting with Fan Weiyue, who tells very interesting details about the restorations of 1958/59 and 1981-85. He also knows that there are old photographs dating from the Minguo period (1912-1949). Mr. Jia and Mr. Zhu from the Shuilu'an are present at the meeting.

Wed, Aug. 29
9:00-18:00
pusa EN 4.21: The surface of the plaster of the dais is smoothened around the figure, remaining small holes are filled.
Check of clouds and cloud parts: No cloud can be attributed to a position on the wall without doubt. The clouds with the small whirls do not come from the canopy although a red cloud of this shape is missing there, they belong to unknown spots of the mountains (grey priming on their back).
Broken clouds are glued again.
Re-attachment of some smaller findings to the *piaodai* of the *tianwang*,of loose and broken elements of the crowns of both *pusa* and of some ornaments from the findings.

Thu, Aug, 30
9:00-16:30
Re-attachment of beaded chain fragments to canopy (F 105 and F 194) and crown of *pusa* EN 4.22 (F 195). Grouting behind *pusa* EN 4.22 is finished.
Parts of the scaffold are removed and photos are taken.
We pack the findings into boxes and make a new list of the boxes.
We clean up and pack material (sand, clay, buckets, stools, and wooden bars remain in Shuilu'an). At the moment when the work is finished, the power fails and does not come back.

Fri, Aug. 31
8:00:
C. Blaensdorf departs to Ziyang with vice-director Wang and Ma Linyan.
Stefan Demeter and Daniel Scherzer accompanied by Gao Yan visit the Museum of the Terracotta Army in Lintong and afterwards depart to Beijing.

Meeting with Mr. Tian, photographer, Aug. 23 (?), 2012

Mr. Tian reports that he took the first photographs from 1977 to 1979, but without systematic approach. In 1981-82, as preparation for the restoration, each figure was photographed in black-and-white. Today there are three sets of the photographs:

- 1 set was given to the Shuilu'an in 2003 by Mr. Tian (but it seems to be unknown where they are stored).
- 1 set and the negatives were given to the *Lantian wenwuju* (Cultural heritage Bureau, Lantian office). Photographs taken during the restoration were also stored by the *Lantian wenwuju*.
- 1 set remained at Mr. Tian's house, and if a restoration will be carried out some day, he may look for them.

Some colour photographs were taken in the 1990's. In 2001, Mr. Tian photographed everything again together with Angelika Borchert (or: she photographed everything and made copies of the photographs for him).[29]

Meeting with Mr. Fan Weiyue, former director of the Shuilu'an, Aug. 28, 2012

Mr. Fan Weiyue, now 85 years old, was director of the Shuilu'an in the 1980's. He wrote two books and a very long poem about the Shuilu'an. He initiated the restoration carried out in 1981-85. He transmits details about the history of the restorations:

1958

At that time the roof was in a bad condition and support beams were inserted underneath the purlins (to lift the roof?). The roof above the west wall was repaired (or renewed). A water drainage was built. The two openings for the ventilators were broken through the western parts of the north and south wall. The two annex buildings (*kufang* or *erfang*) were erected at the gable walls of the *Shuilu dian*. (The side buildings connecting the halls were built during the Qing Dynasty).

Repairs of the figures were not carried out at that time because there were no restorers and nobody knew how to do it.

Later on he tells that a famous sculptor from Xi'an, Xie Dade 谢达(?)德 carried out restorations of the sculptures in 1958 and in 1960 held some kind of class to show how to restore clay sculptures.

In 1958 and 1960 photographs were taken which are still in possession of Mr. Fan.

1960

The revetments of the *shentai* were built using grey bricks. He says that their shape is wrong.

1981-85

The discussion about the restoration lasted for three years before the interventions finally started. Still the lack of restorers was an important problem. The work started in 1982 and lasted 2 ½ years (until 1985). More than a hundred people from the surrounding villages participated in the work.

Two methods were discussed, a traditional one and another one which he does not explain.

According to him the damage was caused by the fact that during the Ming Dynasty another beam (?) had been added at the West side, and as a result of that the West side of the roof became longer and sagged at the curved slope, resulting in a leakage.

Interventions between 1982 and 1985:

[29] The photographs were taken by A. Borchert are slides, and the quality is not good (too dark). Copies of the slides are stored in the project archive in the TUM.

The roof had to be renewed. As in the course of this the sculptures would be exposed to the open air, the work had to be done quickly and the sculptures had to be protected. The protection was done with wooden planks and bags filled with gypsum as spacers, especially at the middle wall. The figures above the middle wall which were attached to the wooden beams were photographed, numbered and cut off (?), so that they could be re-attached correctly to the new beam later on.
Iron anchors were inserted into the northern and southern gable wall and into the west wall.
A brick revetment was built in front of the west wall with a layer of roofing felt (tarred felt, in Chinese: *niu mao zhan*) as isolation in order to prevent the water from penetrating.
Before removing and renewing the roof, the walls were wrapped, the sculptures were removed from the beams and the revetment was built.

No restoration was done on the sculptures.[30] The replacements of clouds, parapets etc. were made by local craftsmen.
Nails and wires as temporary solutions were inserted in 1958, 1960, 1982 and later, but the wires connected with the beams were inserted in 1982.[31]
There were a lot of fragments…..his explanations about that are a bit unclear, but obviously there were no fragments which were stored after the restoration. He remembers that fragments were stored in the 'holes' (i.e. the windows) of the west wall.

In 1982, the front hall was built.

He wrote a report about the restoration which he will give to Mr. Zhu.
In his opinion, water was the main cause of damage to the hall, partly coming in through the leaking roof, but also rising from the foundations. He thinks that the problem is not really solved yet.
He remembers a discussion about the use of an epoxy resin (*huanyang shuzhe*) which the Germans wanted to use and in which a Mr. Xu from the *guojia wenwuju* intervened.[32]
He also remembers a group of experts from Dunhuang visiting the Shuilu'an about ten years ago and recommending the use of 'traditional methods'.

Asked for old photographs, he says that there are photographs taken in the Minguo time (1912-1949), all or part of them by Americans, which are now in some kind of file of archive. As for the name of that archive or file, he cannot remember it nor find it in his poem, but he promises to look it up. He says that the pictures from the Minguo period show that there were many more figures, especially around the large Buddha figures of the middle wall, which are missing today.

The comparison with the old photographs could help to find the original positions of larger findings such as trees, clouds and *piaodai*.

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[30] This seems contrary to the observations on the walls which show larger extensive repairs carried out in the 1980's.

[31] This also dates the repairs, completions and replacements with clay-straw and mould-made parts to the time of 1981-85.

[32] The recollection of the German position is wrong. Epoxy resin was never proposed by the German experts. The recollection may have its origin in a proposal (and a test) by the Center for Conservation in 2005 for using some material mixture to inject under pressure into the cracks in the wall. The German experts strongly advised against that, and finally the idea was abandoned.

PHOTOGRAPHS OF FIGURES AND PARTS OF THE EN WALL

Figures of humans and animals EN 4.1 to 4.23

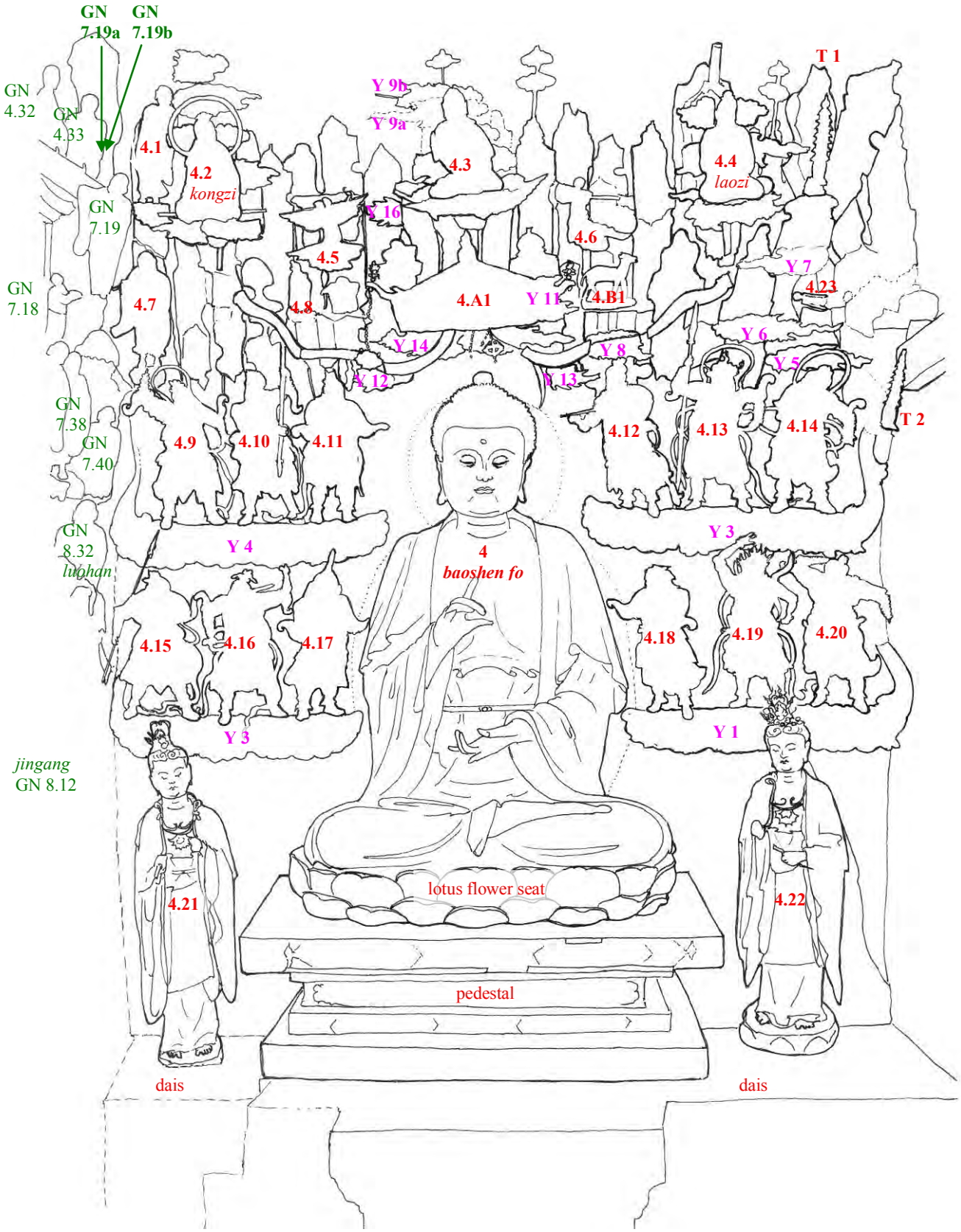


Fig. 312
Overview on numbering: Figures and parts of reliefs
Red: EN wall, figures, pink: EN wall, clouds, green: GN wall figures

Fig. 313
EN 4, *baoshen fo*, before treatment in 2011
[Yan Min, Shaanxi Institute for Conservation]
Total photographs after work in 2011 and before and after work in 2012 could not be taken because the scaffolding concealed parts of the figure.

Fig. 314
EN 4, *baoshen fo*, right hand after stabilisation of the fingers and filling of cracks, in 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 315
EN 4, *baoshen fo*, left hand after stabilisation of the fingers and filling of cracks, in 2011

Fig. 316
EN 4.1, monk, before treatment in 2011

Fig. 317
EN 4.1, during treatment in 2011: temporary fixation
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 318
EN 4.1 before treatment in 2011m view from top

► Fig. 319
EN 4.1 after treatment in Nov. 2011

Fig. 320
EN 4.2 *kongzi*, before treatment in Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 321
EN 4.2 *kongzi*, after treatment in Nov. 2011

Fig. 322
EN 4.2 *kongzi*, during treatment in Oct. 2011, new hanging wire
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 323
EN 4.3 *shijiamouni*, situation in 2005
[Zhen Gang, Shaanxi Institute for Conservation]

Fig. 324
EN 4.3 *shijiamouni*, after treatment in Nov. 2011

Fig. 325
EN 4.4 *laozi*, before treatment in Oct. 2011

Fig. 326
EN 4.4 *laozi*, after treatment in Nov. 2011

Fig. 327
EN 4.4 *laozi*, during treatment in Oct. 2011, detail of new hanging wire behind *laozi*, southern (his left) side

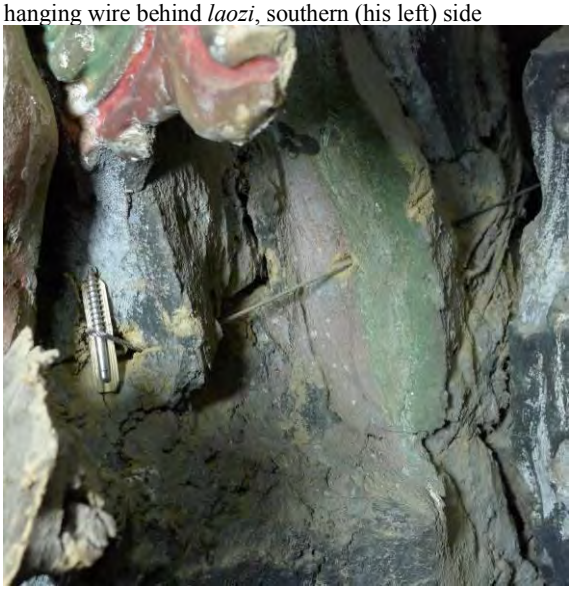


Fig. 328
EN 4.4 *laozi*, after treatment in Aug, 2012, detail right hand with attribute, maybe the stem of a mushroom

Fig. 329
EN 4.5 *feitian*, before treatment in Oct. 2011

Fig. 330
EN 4.5 *feitian*, after treatment in Aug. 2012

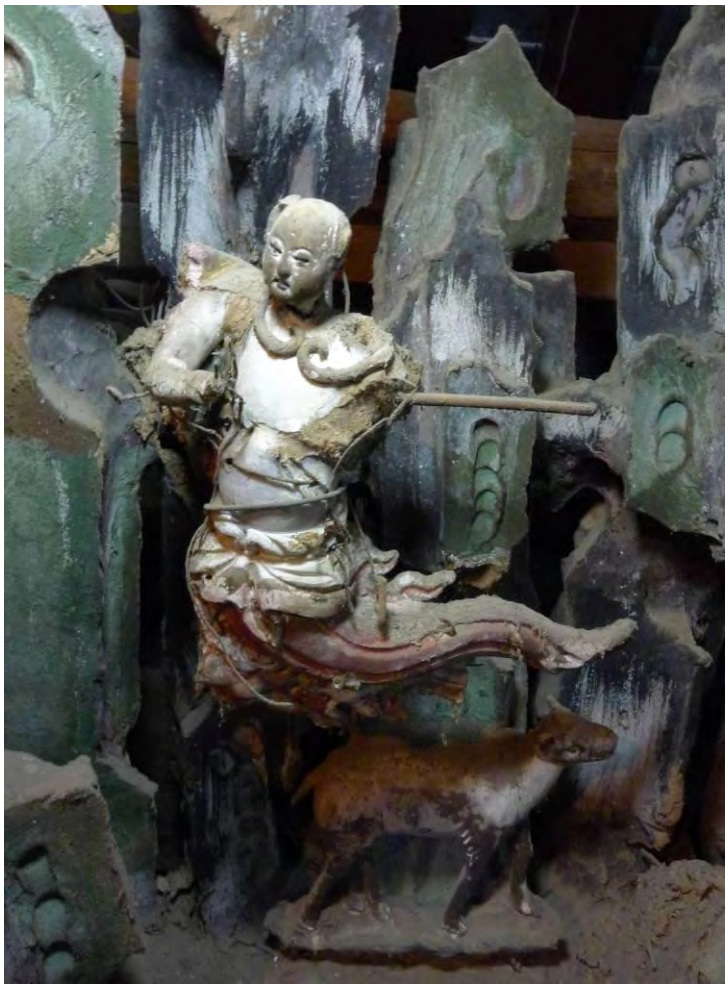


Fig. 331
EN 4.6 *feitian* and deer EN 4.A1, before treatment in Oct. 2011

Fig. 332
EN 4.6 *feitian* and deer EN 4.A1, after treatment in Nov. 2011

Fig. 333
EN 4.7, monk, before treatment in Oct. 2011

Fig. 334
EN 4.7, after treatment in Nov. 2011

Fig. 335
Oct. 2011, mountain S 23 after detaching EN 4.7

Fig. 336
Re-inserting EN 4.7 in Nov. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 337
EN 4.8, standing man, in Oct. 2011

Fig. 338
EN 4.8, in Nov. 2011 (surface cleaned, *feitian* EN 4.5 not mounted yet)

Fig. 339
EN 4.8, in Aug. 2012, after new mounting of *feitian* EN 4.5: the distance between EN 4.8 and the *feitian* EN 4.5 is increased again according to the original position of the *feitian*

Fig. 340
EN 4.B 1, deer, before treatment in Oct. 2011;
the deer is arranged as a counterpart of the man EN 4.8.

Fig. 341
EN 4.B 1, deer, in Nov. 2011 (surface cleaned, *feitian* EN 4.6 not mounted yet)

Fig. 342
Deer EN 4.B 1 after new mounting of *feitian* EN 4.6

Fig. 343
EN 4.9, *tianwang*, before treatment in Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 344
EN 4.9, in Nov. 2011: treatment started (*piaodai* around head stabilized and filled)

◄ Fig. 345
EN 4.9 after treatment, Aug. 2012

Fig. 346
EN 4.9, Aug. 2012, detail of *piaodai*

Fig. 347
EN 4.10, *tianwang*, before treatment in Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 348
EN 4.10, in Nov. 2011: treatment started

▼ Fig. 349
EN 4.10 after treatment, detail, Aug. 2012

► Fig. 350
EN 4.10 after treatment, Aug. 2012

Fig. 351
EN 4.11, *tianwang*, before treatment in Oct. 2011

Fig. 352
EN 4.11, in Nov. 2011: treatment started

◄ Fig. 353

EN 4.11 after treatment, Aug. 2012

Fig. 354
EN 4.11, gluing of broken *piaodai*, Aug. 2012

Fig. 355
EN 4.12, *tianwang*, before treatment in Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 356
EN 4.12, in Nov. 2011: after treatment

▼ Fig. 357
EN 4.12, detail of glued and completed *piaodai*, Aug. 2012

► Fig. 358
EN 4.12, Aug. 2012: the crossguard of the sword was identified among the findings (F 184-1)

Fig. 359
EN 4.13, *tianwang*, before treatment in Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 360
EN 4.13, after treatment in Nov. 2011

◄ Fig. 361
EN 4.13, Aug. 2012: arms glued and right hand re-attached; decoration of helmet stabilized; *piaodai* stabilised with fillings

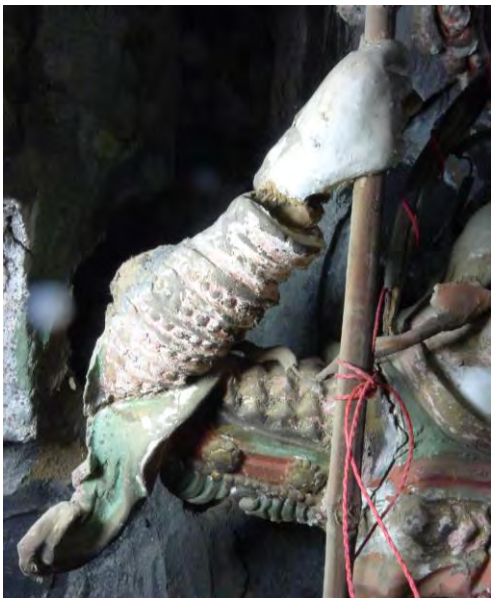


Fig. 362
EN 4.13, right hand broken off at wrist; elbow detached from the wall because the figure tilted to the front, Nov. 2011

Fig. 363
EN 4.14, *tianwang*, before treatment, with temporary fixations, Oct. 2011 [Gao Yan, Shaanxi Institute for Conservation]

Fig. 364
EN 4.14, after treatment in Nov. 2011

▼ Fig. 365
EN 4.14, stabilisation of the *piaodai* around the head, Nov. 2011

► Fig. 366
EN 4.14, Aug. 2012: *piaodai* stabilised with fillings

Fig. 367
EN 4.15, *tianwang*, lower tier, before treatment (with sensor of hygrothermometer, Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 368
EN 4.1, after partial treatment in Nov. 2011

◄ Fig. 369
EN 4.15 after treatment, Aug. 2012

Fig. 370
EN 4.16, *tianwang*, before treatment, Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 371
EN 4.16, after treatment in Nov. 2011

Fig. 372 a, b
EN 4.16, inserting parts of the *piaodai* around the head, discovered among the findings in 2012, Aug. 2012

Fig. 373
EN 4.16, with re-attached and completed *piaodai*, Aug. 2012

Fig. 374
EN 4.17, *tianwang*, before treatment, Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 375
EN 4.17, after treatment in Nov. 2011

◄ Fig. 376
EN 4.17, with re-attached strand of hair,
Aug. 2012

Fig. 377
EN 4.17, strand of hair, discovered in the findings (fragment from F 157), after re-attachment, Aug. 2012

Fig. 378
EN 4.18, *tianwang*, before treatment, Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 379
EN 4.18, after treatment in Nov. 2011

▼ Fig. 380
EN 4.18, detail of the head with cap in the shape of a head of a cat of prey, after treatment, Aug. 2012

► Fig. 381
EN 4.18, *piaodai* around head stabilised
Aug. 2012

Fig. 382
EN 4.19, *tianwang*, before treatment, Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 383
EN 4.19, during treatment in Nov. 2011

Fig. 384
EN 4.19, after treatment, Aug. 2012

EN 4.19, reshaping and re-attaching *piaodai* in 2011:
Fig. 385: ring in front of the belly

Fig. 386: *piaodai* below right shoulder, 2011 and 2012

Fig. 387
EN 4.20, *tianwang*, before treatment, Oct. 2011 (with sensor of hygrothermometer)
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 388
EN 4.20, after treatment in Nov. 2011

▼ Fig. 389
EN 4.18, detail of right arm, broken at the elbow and bent downwards, Oct. 2011

► Fig. 390
EN 4.18, after treatment in Aug. 2012: part of *piaodai* around head discovered in the findings has been re-attached

Fig. 391
EN 4.21, left *pusa*, at the beginning of treatment, Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 392
EN 4.21, Aug. 2012, after removal of debris

Fig. 393
EN 4.21, Aug. 2012, after reinserting the *pusa* into the dais

Fig. 394
EN 4.21, Aug. 2012, re-attachment of decoration elements discovered in the findings to the crown

Fig. 395
EN 4.21, Aug. 2012, re-attachment of part of red *piaodai* discovered in the findings to the crown

Fig. 396
EN 4.7, monk, before treatment in Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 397
EN 4.7, after treatment in Nov. 2011

Fig. 398
EN 4.22, crown, Oct. 2011, before treatment

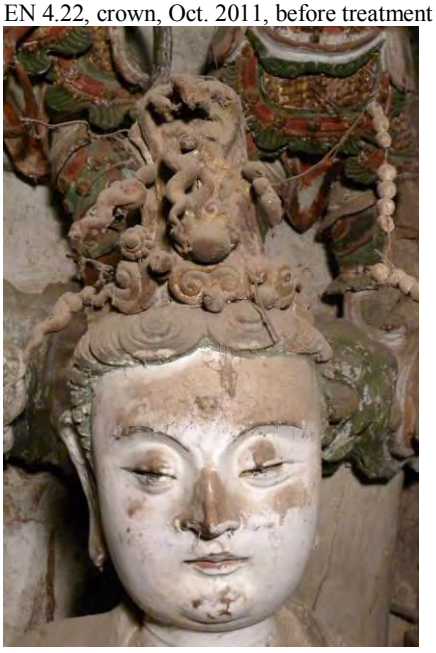


Fig. 399
EN 4.22, crown, Aug. 2012, after treatment

Fig. 400
EN 4.23, corpse, before treatment, Oct. 2011

Fig. 401
EN 4.23, in Nov. 2011, after cleaning of surface and gluing of break in the neck

Fig. 402
EN 4.23, in Aug. 2012, with re-attached tree (finding F 96)

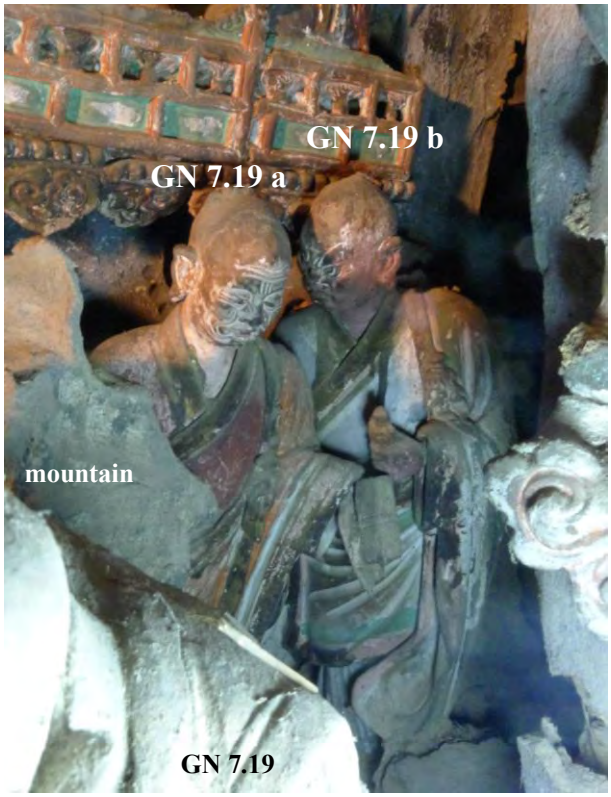


Fig. 403
Monks GN 7.19 a and 7.19 b, before treatment in Oct. 2011

Fig. 404
Stabilisation of GN 7.19 a (re-attachment to mountain), after removal of GN 7.19b, Nov. 2011

Fig. 405
GN 7.19 a, after detachment from the wall, Nov. 2011

Fig. 406
GN 7.19a and GN 7.19 b after treatment in Nov. 2011, seen from the backside of the EN wall

Mountains S 1 to S 36

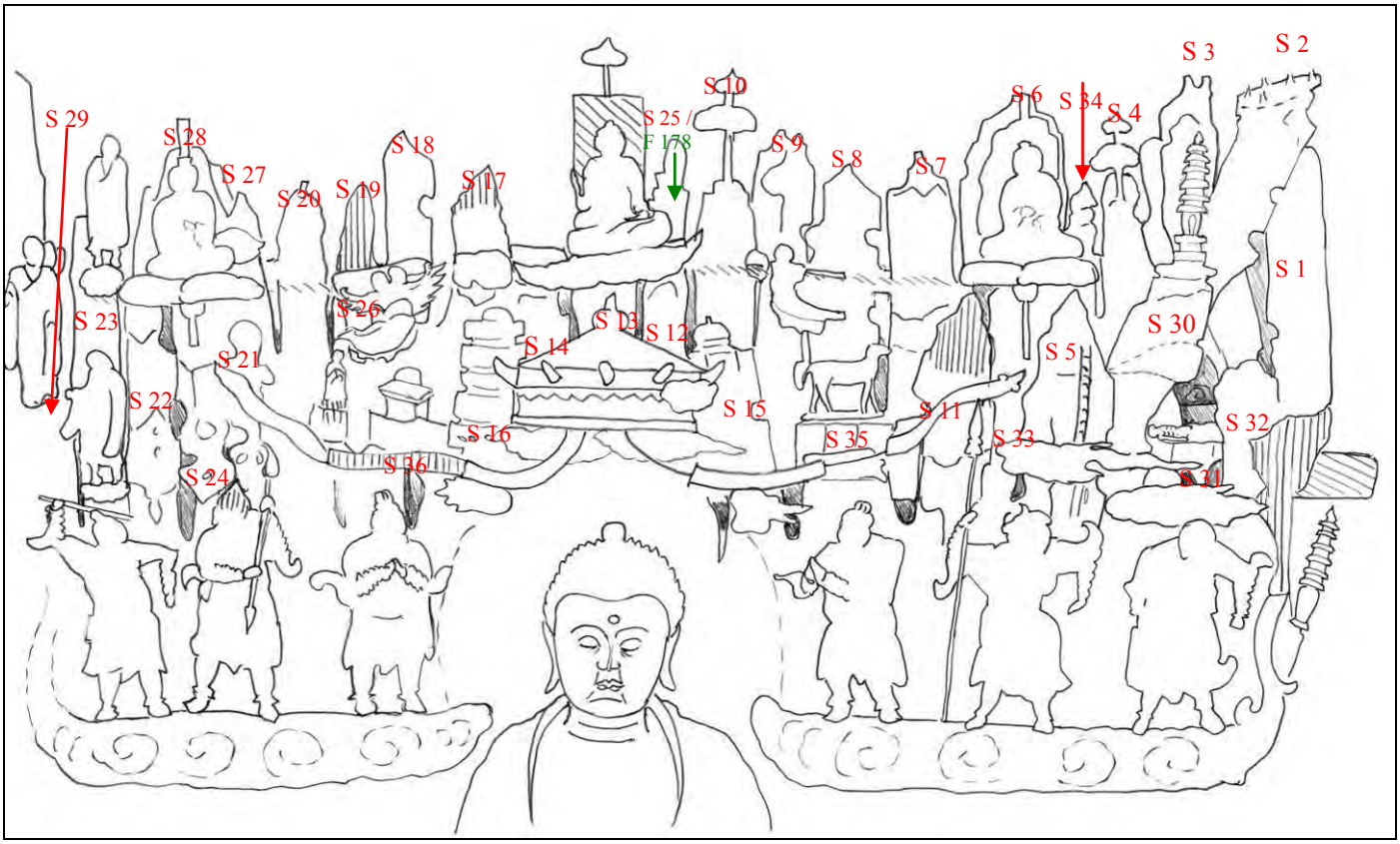


Fig. 407
Overview on numbering: mountains (**S** = *shan* 山) and pagodas (T = *ta* 塔)

wooden parts
completions from 1981-85

Fig. 408
EN S 1, *tianwang*, before treatment in Oct. 2011; red arrow: lost object

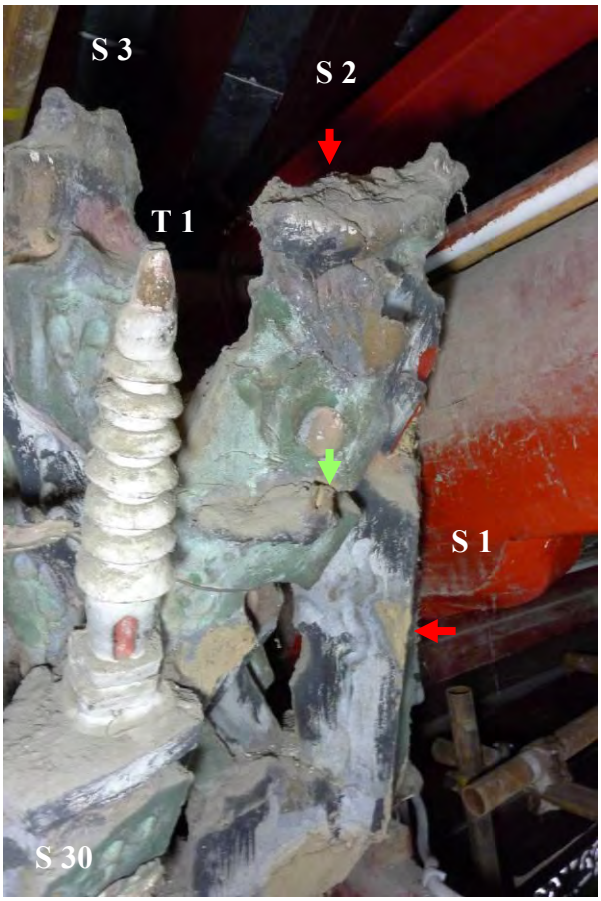


Fig. 409
EN S 2, S 3 and pagoda T 1 on top of S 30, before treatment in Oct. 2011; red arrow: lost object, green arrow: lost tree

Fig. 410
EN S 4 and S 34, before treatment in Oct. 2011

Fig. 411
EN 4.9 after treatment, Aug. 2012, S 4 with re-attached tree

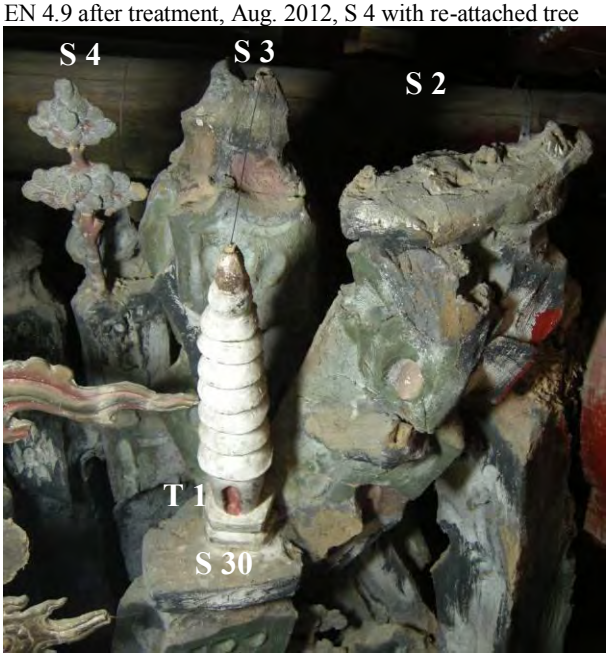


Fig. 412
EN S 30, with cloud Y 7 nailed to the mountain flank, before treatment in Oct. 2011; yellow arrow: nail

Fig. 413
EN S 30, after demounting cloud Y 7; areas without paint layer (red arrows) indicate a lost tree; Nov. 2011

Fig. 414
EN S 5 and lower part of S 30, cloud Y 6, during treatment in Oct. 2011

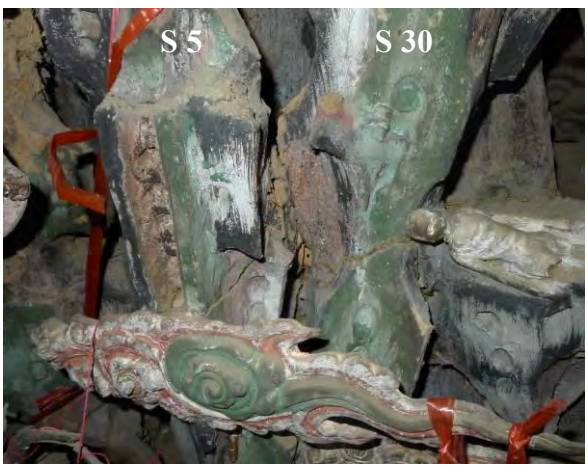
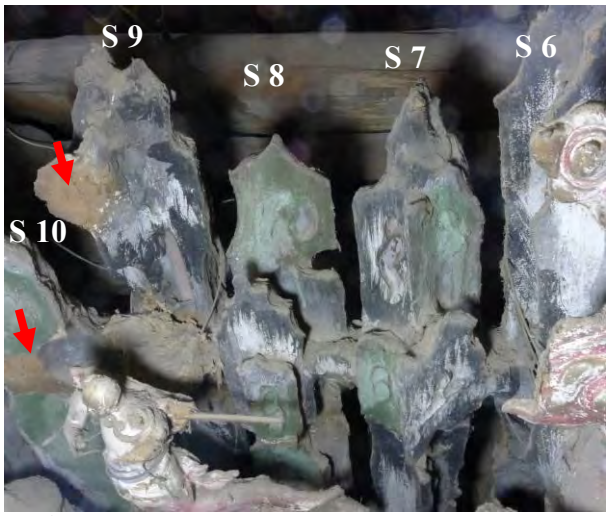
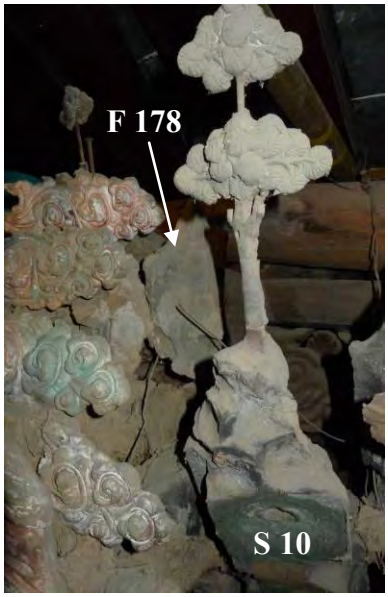


Fig. 415
EN S 5, lower part below cloud Y 6, fixation with hanging wire (yellow arrow); after treatment in Oct. 2011

◄ Fig. 416
EN S 6 with EN 4.3 *laozi*, before treatment in Nov. 2011 [Gao Yan, Shaanxi Institute for Conservation]



▲ Fig. 417
EN S 7, S 8 and S 9, at the lower edge *feitian* EN 4.5; before treatment in Nov. 2011; the missing objects (red arrows) on S 9 and on S 10 next to the *feitian* probably were clouds



◤Fig. 418
EN S 10, upper part with tree before treatment, Nov. 2011

▲ Fig. 419
EN S 10, after treatment, Aug. 2012; the tree was stabilized at the trunk; the clouds and the mountain tip F 178 behind *shijiamouni* EN 4.3 were taken off and stored

◄ Fig. 420
EN S 10, lower part before treatment, Nov. 2011; the missing object (red arrow) probably was a cloud;
at the lower edge of figure: tip of mountain S 15 with lower end of trunk of lost tree (green arrow)

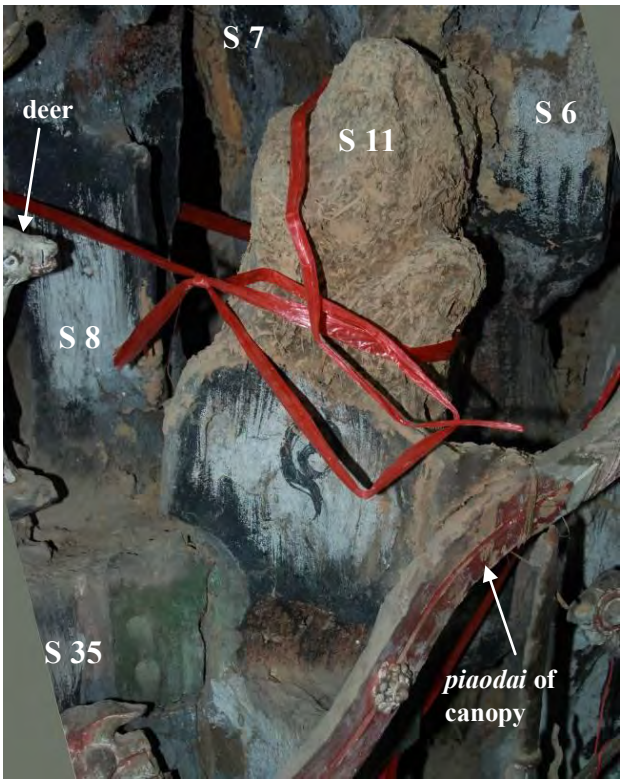


Fig. 421
EN S 11, before treatment, Nov. 2011; the loose tip, remodeled in 1981-85, was temporary stabilised with a string

Fig. 422
EN S 11, after treatment, Nov. 2011: the tip was stabilized; the remodeling was reduced to reveal parts with original polychromy on the S 6 and S 7 and on the *piaodai* of the canopy

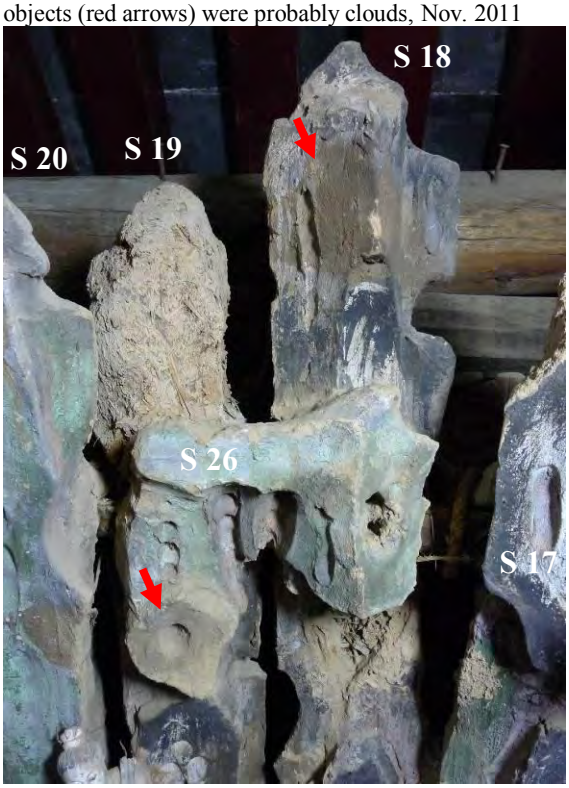
Fig. 423
EN S 12-S16, after treatment, Nov. 2011; S 12-14 are in the background of *shijiamouni* EN 4.3, there tips are lost today (compare fig. 415). On the tip of S 15 a tree is missing; the tip of S 16 was remodeled in 1981-85 and may originally have carried a tree as well

Fig. 424
EN S 17, after treatment, Nov. 2011: the remodeling of the tip from 1981-85 partly covers the original polychromy.

Fig. 425
EN S 18 and S 19 before treatment; S 20 with broken-off tree trunk (red arrow), Oct. 2011

Fig. 426
EN S 18 and S 19, after detachment of *feitian* EN 4.5, Nov. 2011

Fig. 427
EN S 18 and S 19, after mounting of S 26; the missing objects (red arrows) were probably clouds, Nov. 2011



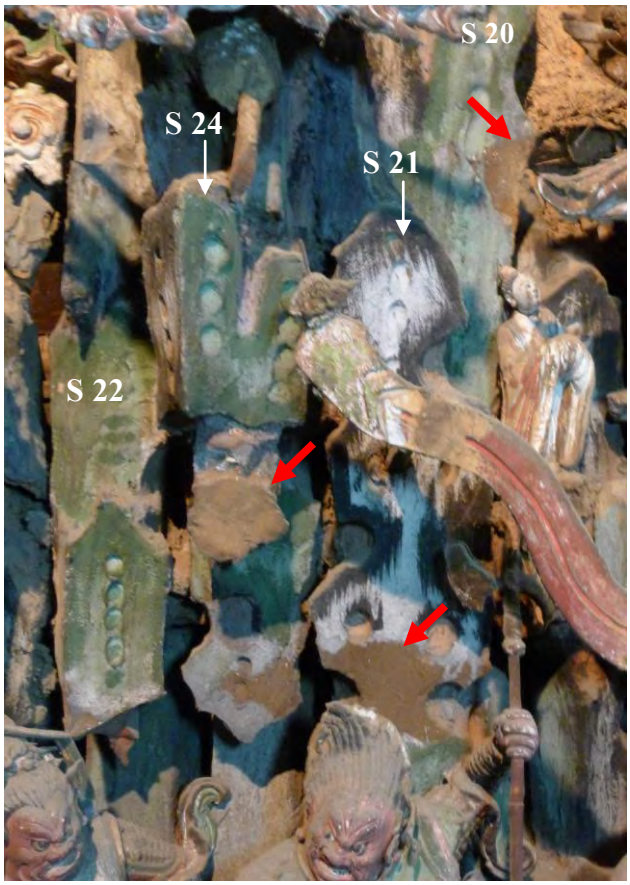


Fig. 428
S 21, 22 and 24, before treatment in Oct. 2011
red arrows: missing parts (probably clouds)

Fig. 429
S 23 with monks EN 4.1 and EN 4.7, before treatment in Oct. 2011; green arrows: break in the modelling of S 23

Fig. 430
S 23, reverse, after stabilisation with steel hanging wires, Nov. 2011; the upper pole (u. p.) ends inside S 23 and caused the damage to the mountain when it sagged

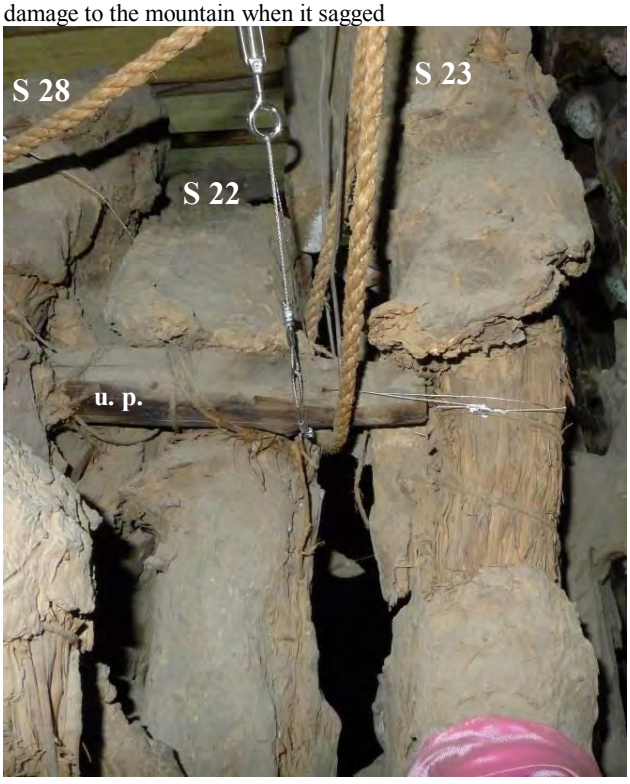


Fig. 431
S 23, after detaching of EN 4.7, exposing the lower pole (l. p.)

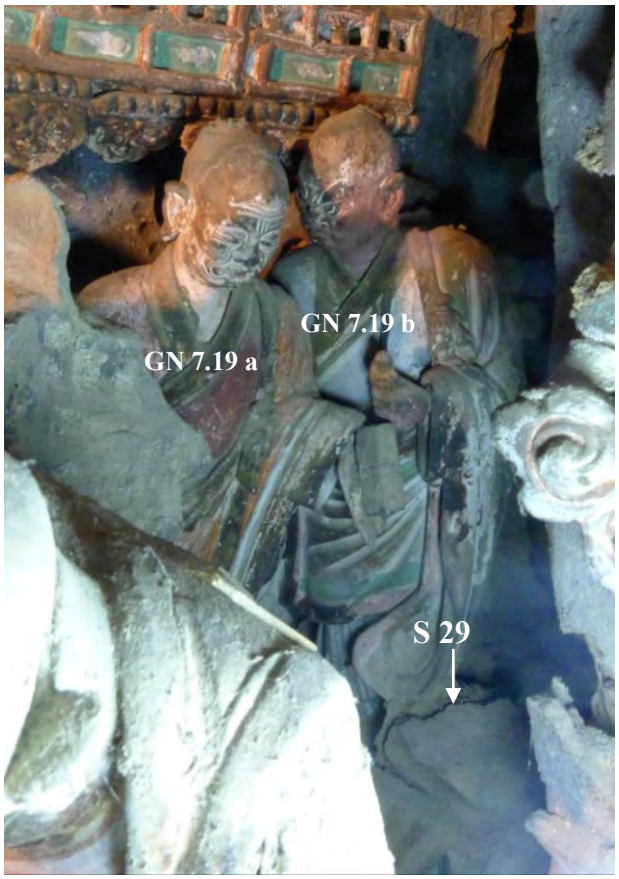


Fig. 432
S 29 with the monks GN 7.19 a and 7.19 b, before treatment in Oct. 2011

Fig. 433
S 29, after detachment of GN 7.19 b, lower pole (l. p.) visible between the mountains, Nov. 2011

Fig. 434
S 29, seen from the backside of the mountains, a after detachment of GN 7.19 b, Nov. 2011

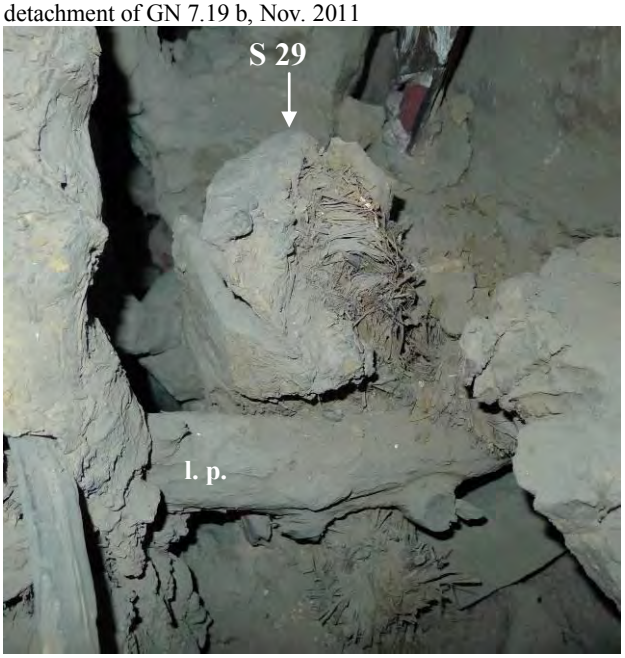


Fig. 435
S 29, during re-attachment of GN 7.19 b and stabilisation of S 29 with steel hanging wire, Nov. 2011

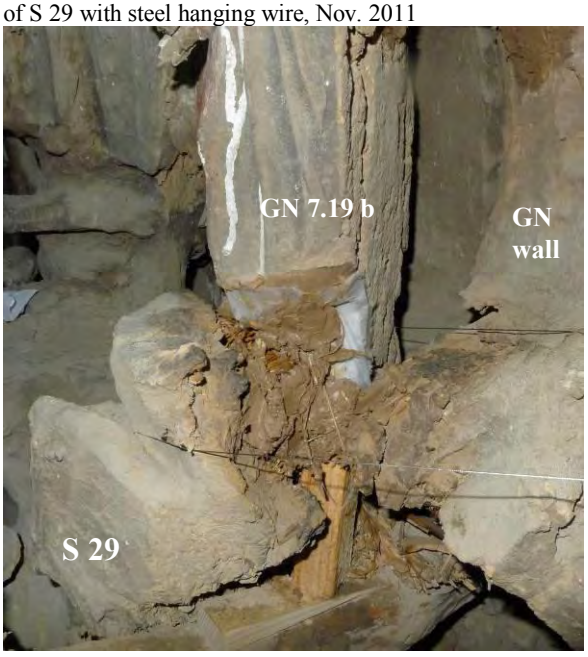


Fig. 436
EN 4 A.1, canopy above head of *baoshen fo*, with *piaodai*, situation in 2005 [Zhen Gang, Shaanxi Institute for Conservation]

Fig. 437
Canopy EN 4 A.1 at the start of the work, seen from above, in Oct. 2011: accumulated dirt and dust has already been removed on the left half; the protruding central arm is fixed with a string as temporary stabilisation. The fragment F-105 of a beaded chain pendant is lying on top of the canopy.

Fig. 438
Canopy EN 4 A.1, view from underneath, Oct. 2011: Two clouds cover the mat that serves as substructure of the canopy roof

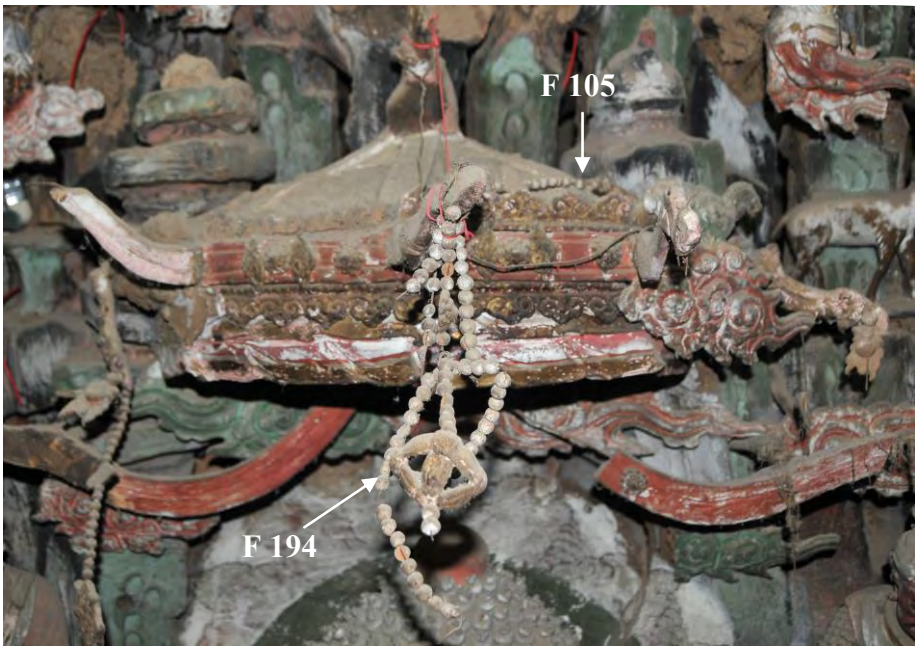


Fig. 439
Canopy EN 4 A.1, front view, before treatment in Oct. 2011
[Gao Yan, Shaanxi Institute for Conservation]

Fig. 440
Canopy EN 4 A.1, front view, after treatment, Nov. 2011: The fragments of beaded chain pendants, F 105 und F 194 were detached and safeguarded

Fig. 441
Canopy EN 4 A.1, front view, after treatment, Aug. 2012: The arms are stabilised, the fragmented beaded chain pendants are re-attached.

Fig. 442
Fragment F 194, after detachment with temporary fixation with sewing threads, Nov. 2011

Fig. 443
Fragment F 105, taken down from the canopy, before conservation, Nov. 2011

Fig. 444
EN T 1, pagoda, after treatment (cleaning and stabilisation) in Nov. 2011

Fig. 445
EN T 2, pagoda, after treatment (surface cleaning) in Nov. 2011