CONSERVATION PROBLEMS

STUDY AND CONSERVATION OF DILAPIDATED FRAGMENTS OF PAINTING ON THE CANVAS FROM KHARA-KHOTO

One of the most important parts of Chinese Buddhist art collection stored in the State Hermitage is a collection of icons from Khara-Khoto, a dead city belonging to a Tangut state Xi Xia which existed over 250 years (10th–13th c.). They were discovered in 1908–9 during excavations in a "famous" subargin by Peter K. Kozlov on the instruction of the Emperor Russian Geographic Society [1].

A complex of painting fragments on the canvas is a part of this unique Khara-Khoto icon collection. They represent pieces of different sizes, which were cut out from decrepit Buddhist icons (fig. 1). As is well known, paintings found during excavations had spent a lot of time underground. Many painting fragments were badly damaged by mould, their colour layer, ground and even canvases were rained. On some pieces the ground was washed out from the support, and the canvas became visible in these places. Colour layer was covered with soil and clay. As a result of negative environmental factors colour layer was badly damaged: it was separated from the support in some places, partly cracked, spalled and powdered (fig. 2).

In the 1940th for the purpose of painting preservation fragments were placed between glasses whose edges were bordered with textile strips. Therefore, at that time preventive conservation of these objects of art was fulfilled (fig. 3).

Taking into account that these damaged painting fragments belong to unique collection, it was necessary to carry out their conservation and create a new form of storage. Before starting conservation work we did the scientific investigations of painting technique. The aim of this work is to show the results of scientific research of the painting materials and share experience of restoring separate fragments of Chinese painting on the canvas.

We carried out an examination of pigments and binding medium of a colour layer and a ground as well as dyes used for coloring of painting support. The investigation of painting technique was fulfilled using methods of polarizing microscopy, gas chromatography, microchemical analysis, UV-spectroscopy.

The study of painting technique was begun with preparation of cross-sections, which allowed evaluating the structure of painting and the size of each colour layer (fig. 4). It was observed that the following pigments were used: red — cinnamon, yellow — yellow ochre, blue — azurite, green — malachite, black — charcoal and soot. Ground consisted of chalk with a lot of binding medium. The supports were dyed by means of yellow dyes. As UV-spectra showed all these dyes belonged to the class of flavanoids.

Gas chromatography analysis showed that main component of binding medium was animal glue, but binding medium composition also included little quantity of polysuccharide glue (up to 0.1%) and about 0.9% of oil components.

At the beginning a plan of conservation work was elaborated including the most essential processes: partial removing of the surface soiling, the consolidation of colour layer and the support: making of fold margins and mending fragments to the mat.

Perhaps, the most serious problem of Khara-Khoto painting fragments is bad condition of the colour layer and the support, both of them were in need of consolidation. Before we could start consolidation of the colour layer and the support we had to clean the colour layer surface from contaminants. Mainly, they were soil residues. Grains of soil and sand were removed with a scalp, the rest gramin were treated with a brush No. 0 made from a kolinsky and a squirrel. Carrying out this operation, it was necessary to take into account bad condition of the painting and avoid damaging of the colour layer during this procedure.

The next stage of the work concerned with the consolidation of the colour layer. Basing on the study of binding medium of the colour layer and ground we decided to use gelatine as the closest matter to glas of original binding medium of painting.

Colour layer consolidation was carried out using two techniques. The first way: applying of 1.0–2.0% gelatine solution with a brush under separate painting fragments flaking from the support; the second way: applying of 0.5% gelatine solution with a sprayer using a graphic section table. As a rule, we had to combine both methods as the colour layer surface on the majority of fragments was covered with shelling everywhere and on some places it was powdered [2].

When local consolidation of the colour layer was required, we carried out slight pre-moistening with a sprayer
using distilled water. This operation was necessary to avoid
dump stains.

Consolidated places of the colour layer, step by step, were
pushed down with a Teflon palette spatula and then
placed under a light local weight (100—200 grams). In a
case when the whole surface of the colour layer was con-
solidated the whole fragment was placed under local load.
In both cases for drying and flattening interleaving mate-
rial-hollytex and folios of filter paper were used.

During the next important part of this work we paid at-
tention to the consolidation of the canvas support. Gluing
tears was carried out using fine Japanese paper Minogami
(Kozo 100%) and Tengujo (Kozo 100%) with applying
medium concentration (2%) wheat starch paste. As the
gluing was over local load with two layers of hollytex and
filter paper was placed on the tear for flattening of the glued
part.

Repairing considerable lost places of the support was
fulfilled using Japanese paper Tengujo (Kozo 100%) or
Minogami (Kozo 100%). However these insets were not
reconstruction of the art object but represented just a “sup-
porting structure”. They were glued using 4% wheat starch
paste to the very edge of the object so they could be easily
removed if the necessity arose.

The method of lost partial repairing is identical to that
of fold margins preparing. This method was borrowed from
the Japanese restoration [3].

Margins as well as repairing of the lost fragments were
made from Japanese paper Tengujo (Kozo 100%) or
Minogami (Kozo 100%). Margins making was performed
employing two methods, which have some distinctions.
A milinex folio was placed upon the prepared object
(bigger than the object by 10 cm on each side), then a folio of
Japanese paper Tengujo was placed above (bigger than
the object by 5—8 cm on each side). Both folios were fixed
on edges with local weights. Afterwards the silhouette of
the fragment edge was outlined with a fine line of a pencil.
Then the folio of Japanese paper was taken off the object
and treated as follows: the midst of the folio was cut out
using scissors short of the outline by 2 mm. Then the inter-
nal edge was “plucked” with tweezers till the edge becomes
fluffy (fig. 5). Prepared in such a way, the folio of Japanese
paper was placed on the milinex face up, fixed on corners
with local weights, then the fluffy edge was applied with
4% wheat starch paste. After that the folio was released from
local loads, lifted and placed on the back side of the
fragment so that the fluffs covered with paste should lie on
the fragment edge. Connected fold margins were pushed
down to the object with the palette spatula. If the paste on
fluffs was dried, and they could not be glued to the object
edge, these parts were glued by paste from the inside again.

The second method of fold margins making differed from
the first one: instead of scissors and tweezers a mois-
tened thin kolinsky paint-brush was used. A wet line was
made on a folio of Japanese paper along with the fragment
outline using a brush moistened in distilled water. Then
“outlined” internal part of the paper was torn off through
the outline to form a fluffy edge. This method of fold mar-
gins making is easier and quicker but is less accurate as
holes may form on the border of object and fold margins.

The choosing of the right method of storing and exhib-
ting painting fragments on the canvas convenient for the
curator and the object has become important after the work
was over. We were first who used acid-free cardboard on
fold margins from Japanese paper for the mounting of such
objects [4].

Such mat consists of two folios of cardboard with a
“window” and two covers covering the object from both
sides. All mat parts are connected together by one of edges
with an archival heat set cotton cloth tape or an archival
document repair tape.

Painting fragment was placed in the “window” and
fixed on fold margins between two folios of cardboard. In
such a position it was well fixed, protected and easy to
study (fig. 6).

Therefore, during study of painting layer structure of
canvas dilapidated painting fragments on the canvases, we
concluded that condition of these objects required a special
approach when planning conservation. Prior to starting
work we thought over each step of the process of object
conservation. The basic idea was to confine only to opera-
tions necessary to avoid further object destruction. We
comprehended that serious intervention while restoring ob-
jects created about seven hundred years ago and kept un-
derground under extreme conditions for a long time may
cause unpredictable consequences. That is why we used
only conservation methods necessary for further preserva-
tion of the object. Removing surface soiling we did not aim
in the full cleaning of painting layer because active treatment
with water or organic solutions could cause a partial loss of
the colour layer. Choosing a consolidation solution for the
colour layer we preferred a natural organic polymer whose
properties are like those of original painting binding me-
dium. Using top quality reversible conservation materials
allowed us to glue tears, repair lost support, make fold mar-
gins and create a special mat.

Employing foreign colleagues’ experience in the field
of mut preparation for graphic arts we stored we updated
it and were the first who applied it for storing and exhibit-
ing painting fragments on the canvases. This new form of
storage lets us not only to improve conditions of archiao-
logical objects storage but also protect them from environ-
mental influence and allows researchers to carry out further
study of painting objects (fig. 7).

Notes
2. Restoratoratna protvovetn grafiki. Mestodicheskie rekomendacii (Restoration of Graphic Art Objects. Methodological Recom-
   mendations), compiled by L. L. Meliukha, and E. A. Komitko (Moscow, 1995), p. 35; Paper Conservation Catalogue. IRCB Book and Paper
3. ICCROM. The International Centre for the Study of Preservation and the Restoration of Cultural Property, Paper Conservation
Illustrations

Fig. 1. Icon fragment. Canvas, 24.5 × 12.0 cm. Khara-Khoto, 14th c. (face prior to restoration).

Fig. 2. Icon fragment. Canvas, 24.5 × 12.0 cm. Khara-Khoto, 14th c. (face prior to conservation, clearance taking).

Fig. 3. Several fragments in the former mounting, between glasses.

Fig. 4. Cross-section of the light-blue part of the fragment colour layer, 24.5 × 12.0 cm.

Fig. 5. Illustration of fold margin edge treatment.

Fig. 6. Icon fragment. Canvas, 24.5 × 12.0 cm. Khara-Khoto, 14th c. (face after conservation).

Fig. 7. Icon fragment. Canvas, distemper. Khara-Khoto, 14th c. (in a special mat).
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Back cover:
Plate 2. No. 13-34/39/8. Ibid, “A visit to a Shinto shrine”, Life of Japanese people. Edo Period (19th c.). Painting unformatted (album folio), colour on silk, gold, 35.1 × 46.3 cm (whole), 32.3 × 44.3 cm (painting), no seal, no signature.
Plate 3. No. 13-34/39/54. Ibid, “Wedding ceremony”, ibid. Edo Period (19th c.). Painting unformatted (album folio), colour on silk, gold, 32.5 × 44.5 cm, no seal, no signature.
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