
蓬萊蒔絵手箱

平成12・13年度修復事業



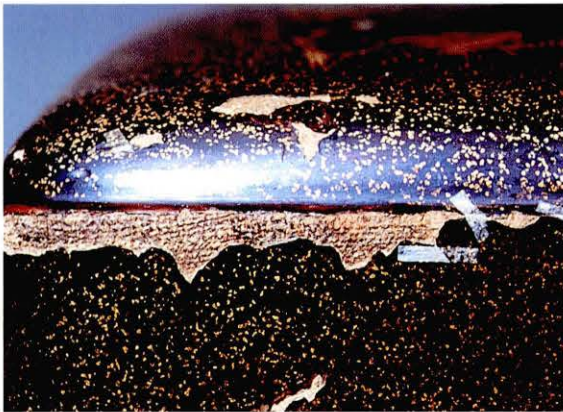
品名：蓬萊蒔絵手箱
所蔵：ハンブルグ工芸博物館
所蔵番号：1904-73



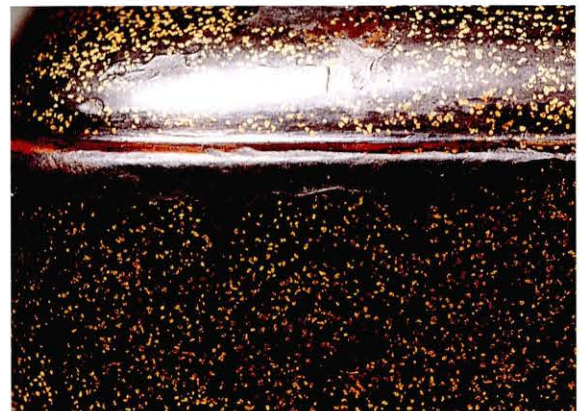
15 風景蒔絵ナイフアーン 修復後全景



16 シェラックによる後世修理



17 後世修理除去後



18 修復後

ハンブルグ工芸美術館蔵

蓬萊蒔絵手箱

漆修復家
松本 達弥

品名：蓬萊蒔絵手箱
所蔵：ハンブルグ工芸博物館
所蔵番号：1904-73
修復施行：目白漆芸文化財研究所
修復：松本達弥
工期：平成12年6月～平成14年3月

はじめに

平成12年度の在外日本古美術修復協力事業として、平成12年度から13年度の2年に亘って、東京国立博物館内修復室及び東京文化財研究第一修復アトリエにおいて、ハンブルグ工芸美術館所蔵の蓬萊蒔絵手箱の保存修復が行われ、平成14年3月末に終了した。この報告書は、保存修復で得られた情報を記録にまとめたものである。

概要

品名 蓬萊蒔絵手箱
所蔵館 ハンブルグ工芸美術館
所蔵番号 1904-73
時代 15世紀末～16世紀
法量 26.8×31.7×17.0cm

この蓬萊蒔絵手箱（以後、本資料と呼ぶ）は、15世紀末～16世紀の室町時代の制作として、1904年（明治37年）に美術商であった林忠正によって当美術館に寄贈されたとして伝えられている。

「蓬萊」とは、古代中国の神仙思想による思想郷で、不老不死の妙薬を持つ仙人が住む場所として歴史書に記されている。中国からもたらされた理想郷は独自に解釈され日本に根付き、平安時代の法隆寺献納宝物である「蓬萊山蒔絵袈裟箱」（東京国立博物館蔵）を始め、鎌倉時代、室町時代と蓬萊をテーマに工芸意匠として好まれた。本資料も、蓬萊の姿を和風に変化したものだと思われる。

本資料は制作されてから約500年の時代を経て、輸出前の日本では何度も繰り返し修復が行われ、ヨーロッパに渡ってからも数回修復されている。

加飾技法

本資料の形態は、長方形、角丸の合口造りで、ゆるやかな甲盛と若干の同張りがある。長側面の中央には菊枝彫りの円形紐金具が打たれている。（写真106）

蓋表には松と竹の生える土坡が配され、流水と土坡の間に岩を配し、左の岩には亀を置く。土坡に2

羽、水辺に1羽、空には4羽の鶴が描かれている。四側面は、身から蓋鬘までを一つの画面として各面には松と竹が生える土坡が配され、長側面には二つの岩を置き、短側面には一つの岩を置く。蓋裏は、松と竹の生える土坡を配し、土坡の左右に鶴、中央には亀を描き、空には飛ぶ鶴を描いている。(写真107)

総体は、黒地の透漆塗りに梨子地粉を淡く地蒔きし、蓋表と各側面の土坡は、丸粉と平日粉の暈し蒔きによる研出蒔絵で表される。松と竹、鶴と亀は平蒔絵で表し松の幹と岩は地ノ粉の蒔地による高上げの高蒔絵に銀切金を置き表される。側面は蓋表とほぼ同様の技法が用いられるが、蓋鬘と身の側面に描かれている松と竹、そして松の幹と岩に置かれた切金の材質の相違がある。蓋裏は、蓋表と同様の技法で表されるが、梨子地粉による地蒔きが蓋表よりやや淡く蒔かれ、全体に透漆が被った状態である。土坡部分は特に茶色く色斑がある。

損傷状態

1. 本資料の塗膜全体は、ヨーロッパに渡ってからの修復で塗られた洋塗料が劣化し、茶褐色に変色している。
2. 蓋表面の漆塗膜は劣化し、無数の剥離剥落があり下地の露出部分が多く見られる。
3. 蓋の角には、木地の接合部と思われる箇所大きな亀裂があり、その周辺塗膜は殆ど剥離している。
4. 蓋の塵居部分は殆どが後世修理であり、塗られた透漆が変色し、その周辺塗膜は剥離、剥落が多く見られ手で触れられないくらい危険な状態である。
5. ヨーロッパでの後世修理で、亀裂や剥落部分に蠟のような洋塗料が埋められている。
6. 蓋表の、松の幹と岩の高蒔絵部分に剥離剥落があり、高上げに蒔かれた地ノ粉の肌が露出している。
7. 後世修理で置かれた銀切金に、銹化による変色がある。
8. 蓋裏のすべての隅は洋塗料で埋められ、後世修理で覆輪を接着した際、麦漆の拭き残しが多く見られる。
9. 身正面の左角中央に打損による塗膜の剥離が一箇所ある。
10. 蓋身の覆輪の外側には、朱色の塗料の上に茶褐色の塗料が塗られ、身の覆輪の一部には朱色がかなり露出している。
11. 身の覆輪合口部の四隅すべてに亀裂が見られる。

修復仕様

修復は原則として現状維持修復を基本とし、それぞれの傷みの現状を把握し、修復方針を決定する。具体的な内容については下記に列記する。また、修復仕様の変更は東京文化財研究所伝統技術研究室室長の加藤寛氏と修復担当の松本達弥とで協議し決定することとした。

1. 表面塗膜に塗布された塗料と剥落及び亀裂部分に充填された材料の分析を行い、塗膜に損傷を与えない溶剤と作業方法を選択し除去する。
2. 輸出前の修復で、茶色く下地が透けてみえ色調が目立つ後世修理は除去する。
3. 表面塗膜の細かな断文に漆を含浸し塗膜強化を行う。
4. 亀裂及び剥離部分に麦漆を含浸し、竹ひごによる芯張りで圧着を行う。
5. 塗膜の欠失した部分や後世修理を除去した部分は麦漆を含浸後、刻苧を充填し形状復元を行い下地を施す。
6. 後世修理での覆輪接着の際、塗膜にはみ出した接着剤を除去する。
7. 覆輪の金属分析を行い、塗布された茶褐色及び朱色の物質を特定し修復方法を検討する。

修復工程と内容

1. 調査及び写真撮影

本資料の木地構造 (図105)、下地、加飾と現状の傷みを調査記録し、修復工程を決定した。また、修復前の写真撮影をし、修復後と比較出来るようにした。

2. 養生

今後の作業において、剥落の恐れがある危険な塗膜に小片に切った雁皮紙を生耒糊で仮止めをし作業中の剥落を防止した。

3. 掃除

本資料を覆っている埃や糸くずは毛棒を使って取り除き、綿棒や綿布に極少量の水を含ませ汚れを掃除した。

4. 分析 (洋塗料)

塗膜に塗布された洋塗料は、水や溶剤 (エタノール、無水エタノール、アセトン) をそれぞれ綿布に含ませて溶かした塗料をテストサンプルとし、欠損部の充填剤は刀にて削った小片をサンプルとした。分析は、東京文化財研究所の早川典子さんに材料分析を依頼した。分析の結果、両方ともヨーロッパの修復でよく使用されるシェラックであることが判明した。

5. シェラック除去 (塗膜表面)

表面の漆塗膜には、マイクロクラックが入っているため強い溶剤を使うと塗膜や蒔絵に影響を与えるため、数種類の溶剤をテストしてみた。

- ・水 (蒸留水) …………… あまり溶けない
- ・水 + エタノール (75%) …………… 溶けるが時間がかかる
- ・エタノール (75%) …………… 溶けやすい
- ・無水エタノール (99.5%) …………… 揮発が速くて溶けにくい
- ・エタノール (75%) + アセトン………… 溶けやすい

結果、漆塗膜の影響を考え基本的にはエタノール (75%) と少量の水を混合した溶液を使用することにした。

シェラックの除去は、綿布に小さく切ったあてゴムを包み、溶剤を少量ずつ付けて塗料を溶かし除去した。この際、漆塗膜や蒔絵に影響を与えないよう細心の注意を払った。また、溶けにくいシェラックはエタノール (75%) とアセトンの混合溶液を使用した。(写真108、109)

6. 漆固め

劣化した漆塗膜の強化と今後の作業に影響を与えないよう塗膜全体に漆固めを行った。漆固めに使用した漆は、生正味漆と木地呂漆を1対4の割合で混合し、石油系溶剤のクリンソルGを4倍に希釈し平刷毛で塗膜に染み込ませた。この際、松の幹や岩部分にある銀切金は錆化して周辺塗膜にも拡がり、漆が浸透すると拭き取りの際、錆を落としてしまう恐れがあるため漆が入らないよう注意した。染み込ませた漆は、乾かないうちにリグロインにて丁寧に拭きとった。(写真110)

7. 後世修理の除去 (シェラック)

蓋の塵居周辺の塗膜が最も傷んで、漆とシェラックによる修理が行われている。シェラックの除去は、溶剤での除去を考えたが非常に厚く充填されていて、溶かしての除去は周辺塗膜を傷める恐れと、オリジ

ナルの下地に染み込ませてしまう恐れがあるため、ポイントで削れる刃物を選択した。

シェラックは思ったより柔らかく、蠟を削っている感じで除去は容易であったが周りの塗膜は殆ど剝離しているため剝落には十分注意した。(写真16、17、18)

8. 後世修理の除去 (漆による修復)

漆を使って修復された塗膜は、茶色に下地が透けていて蓋の塵居部分の7割ぐらい修復されていた。後補のうち、色調が明るく目立つ部分は刃物にて除去することにした。後補された部分は地ノ粉下地部分から剝落し、制作当初の布張りの上に膠下地で形状復元し、金梨地粉を蒔き透漆が塗り込まれていた。(写真111)

9. 蓋裏の接着剤の除去

後世修理で覆輪を付け直した際に麻の繊維が混入された麦漆が全ての覆輪際に残されていた。固まった麦漆の除去は、切れの悪い刃物で塗膜と麦漆の間に刃を入れて塗膜を傷めないよう少しずつ丁寧に除去した。この際、切れる刃物だと塗膜を傷めてしまうため敢えて切れの悪い刃物に仕立てた。(写真112～116)

10. 塗膜の押さえ

剝離した塗膜を芯張りで押さえるために、本資料が入る木枠と蓋が納まる内型、外型の受け台を作った。接着は、塗膜の接着用に調節した麦漆を、塗膜下によく浸透するようリグロインで希釈し含浸させた。リグロインの揮発をまって、平らな塗膜の上にはビニール板 (0.5^{mm}) にアクリル板 (1.0^{mm}) を合わせて置き、アールのある箇所にはビニール板 (4^{mm}) に薄い塩ビ板 (0.5^{mm}) を合わせて置き芯張りをした。圧力は、竹ひごの弾力を利用して圧着を行った。(写真117、118)

11. 亀裂の接着

木地構造の接合部と思われる蓋の角と、天板と側板の接合部である塵居部分に亀裂があり、蓋の背面左角の木地接合部には1^{mm}程の隙間が開いている状態であった。接着は塗膜の押え同様、竹ひごによる芯張りの圧着とした。構造接着用に麦漆を調節し、周辺塗膜も同時に圧着を行った。(写真119、120、121)

12. 欠損部の形状復元

後補の除去した部分や塗膜の欠失した部分は、刻苧で形状復元を行った。刻苧は、麦漆に松材の木粉と麻の繊維を細かくした粉を混ぜ合わせて作り、数回に分けて充填した(写真122)。形状が整った箇所に、珪藻土を焼いた微粒子の地ノ粉を2回蒔地をし、固めとして石粉の錆漆に松煙と弁柄を混ぜ合わせたものを固めて際錆とした。また、亀裂部分や押さえた塗膜の周りにも、再剝落を防ぐため際錆を施した。

13. 塗膜の強化と艶の復元

塗膜表面の強化と艶の復元のため、生正味漆と木地呂漆を混ぜ合わせた漆で漆固めをし艶を合わせた。

14. 保存箱及び袱紗の作制

修復した本資料の保存として、手箱全体を包む絹羽二重の袱紗を作り、乾燥や湿気を防いでくれる桐材で保存箱を作制し、本資料を納めた。

15. 記録及び写真撮影

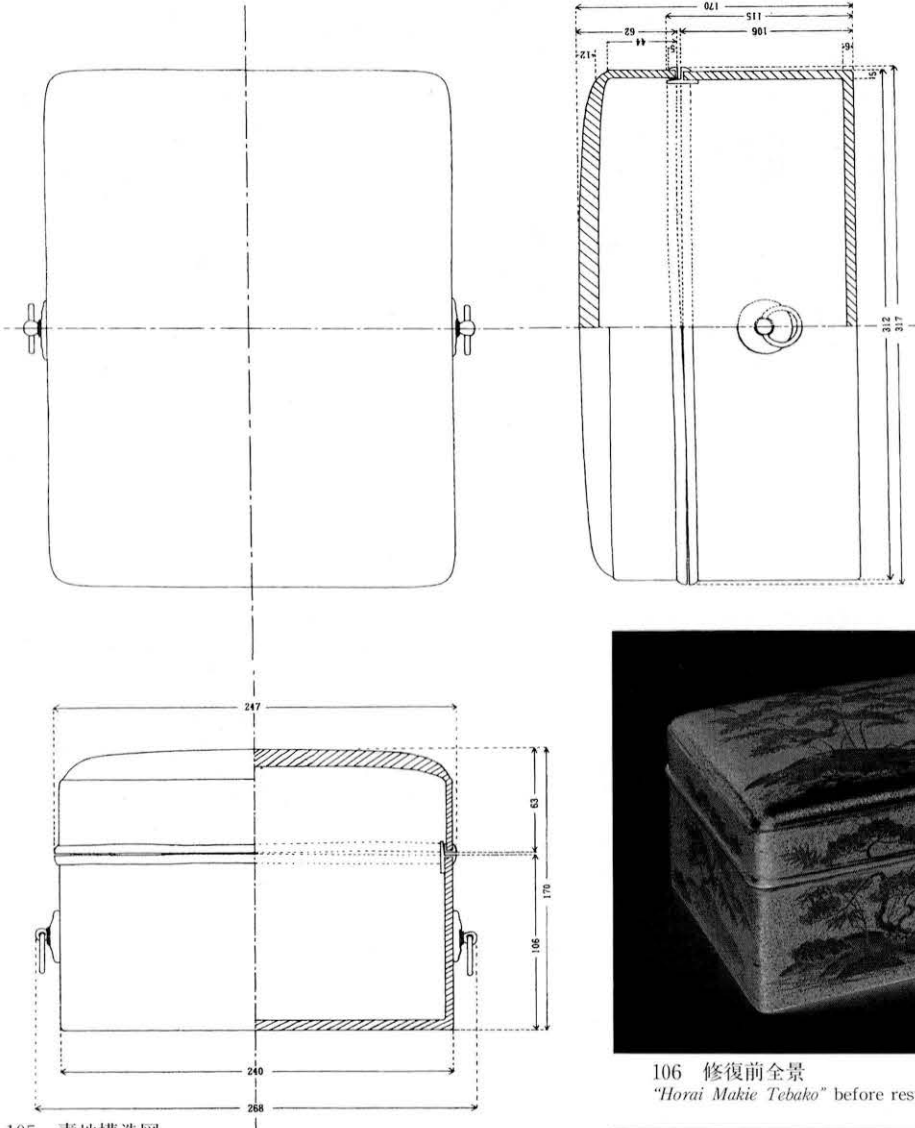
修復の記録をまとめ、修復後の写真撮影を行い全ての工程を終えた。

金属分析

修復と平行して加飾の材料分析及び、身の覆輪の朱色部分と蓋の茶褐色部分の処理を決定するため、蛍光X線分析を行った。分析は、東京文化財研究所の平尾良光先生、早川泰弘先生に依頼した。

切金についての分析では、蓋表の切金は錆化の状態から銀切金であるが、身にある切金は、錫と鉛が9対1の合金で殆ど錫切金であった。(写真123、124)

覆輪の朱色部分と茶褐色部分の分析を行った結果、蓋と身の覆輪は両方とも錫と鉛が6対4の合金であ



105 素地構造図
Structure of the substrate



106 修復前全景
"Horai Makie Tebako" before restoration



107 蓋表修復前
Lid before restoration



108 塗膜クリーニング (シェラック除去)
Cleaning the urushi coating (removing shellac)



109 シェラック除去 (上：除去前、下：除去後)
Removing shellac (top: before removal, bottom: after removal)



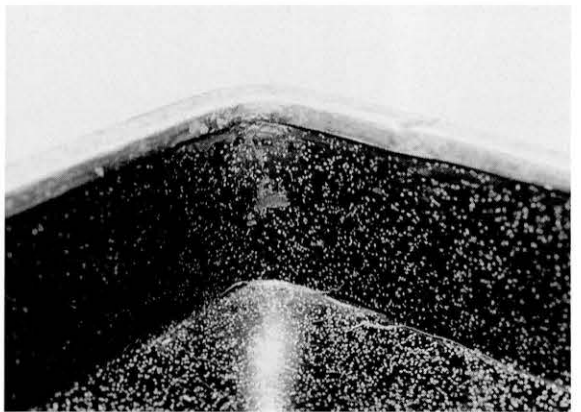
110 漆固め
Urushi katame



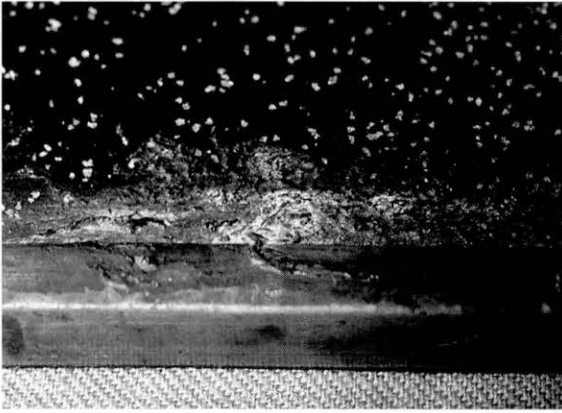
111 後世修理除去 (膠下地)
Removing previous repair (*nikawa* foundation)



112 蓋裏修復前
Inside of the lid before restoration



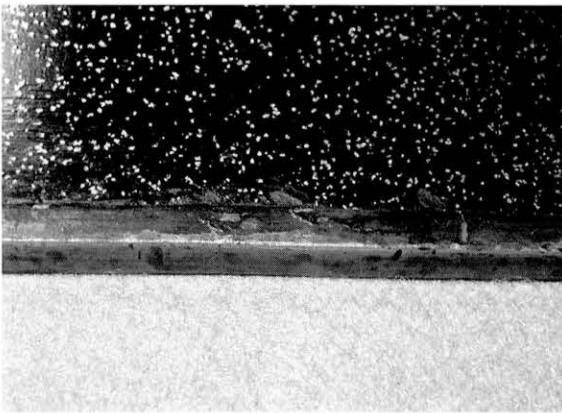
113 蓋裏修復後 (麦漆及びシェラック除去)
Inside of the lid after restoration (after removing *mugi-urushi* and shellac)



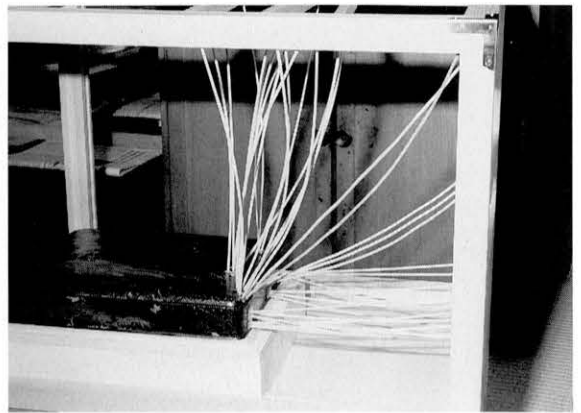
114 蓋裏修復前
Inside of the lid before restoration



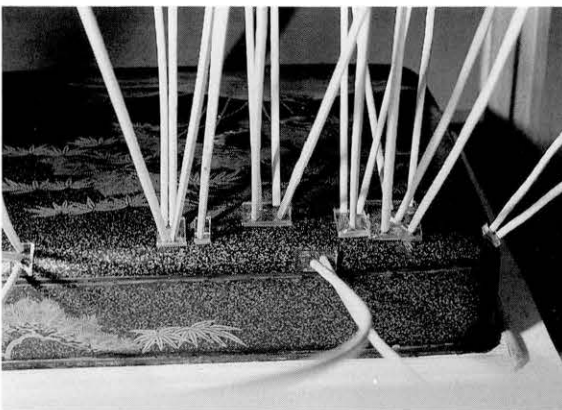
115 蓋裏麦漆除去
Removing *mugi-urushi* from inside of the lid



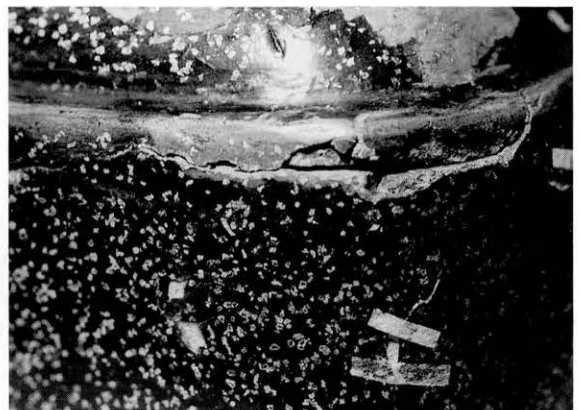
116 蓋裏修復後
Inside of the lid after restoration



117 蓋鬘芯張り圧着
Press stabilizing the side of the lid with *shimbari* sticks



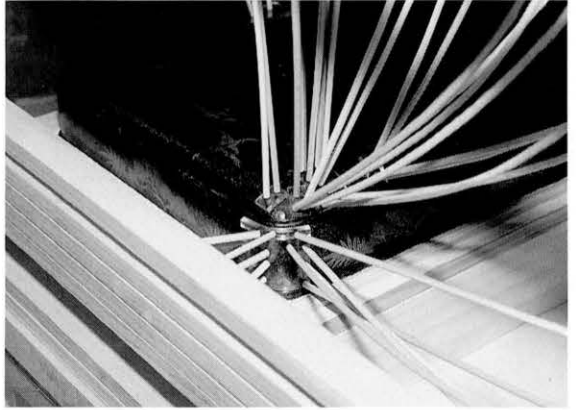
118 蓋表芯張り圧着
Press stabilizing the top of the lid with *shimbari* sticks



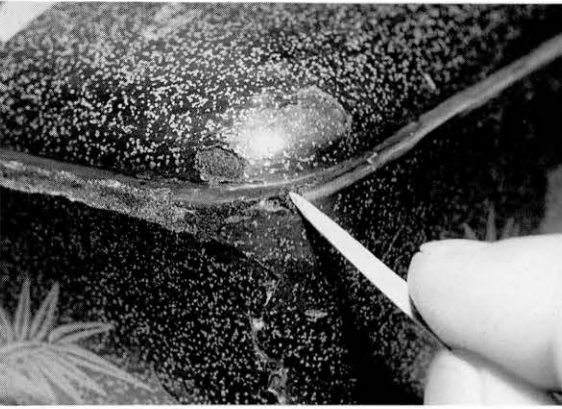
119 蓋角亀裂部分
Cracks at the corner of the lid



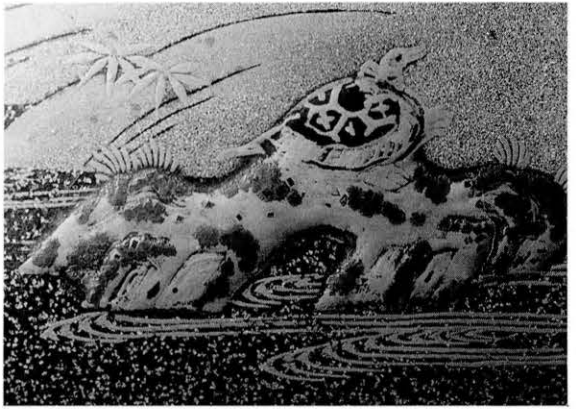
120 麦漆含浸
Impregnating *mugi-urushi*



121 亀裂部分の圧着
Press stabilizing the cracks



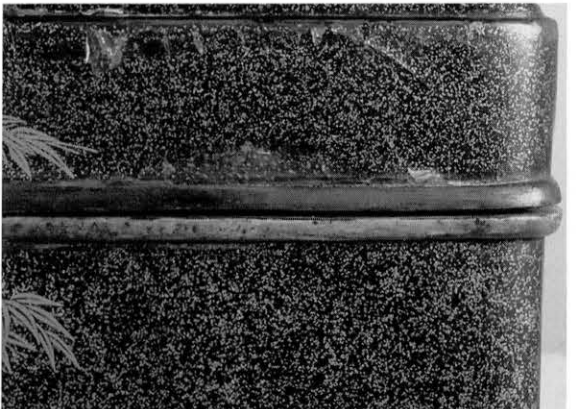
122 刻苧充填
Impregnating *kokuso*



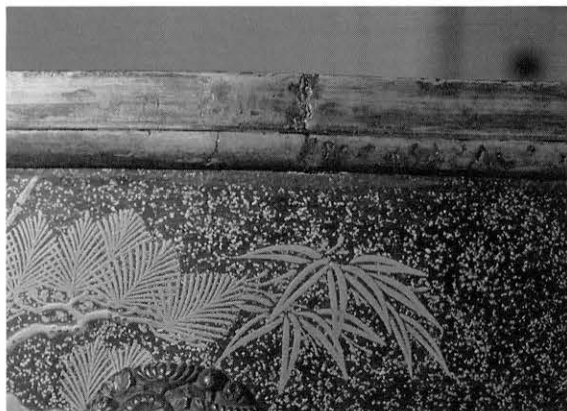
123 蓋表岩部分 (銀切金)
Rock on the top of the lid (silver *kirikane*)



124 身正面岩部分 (錫切金)
Rock on the front of the Box (tin *kirikane*)



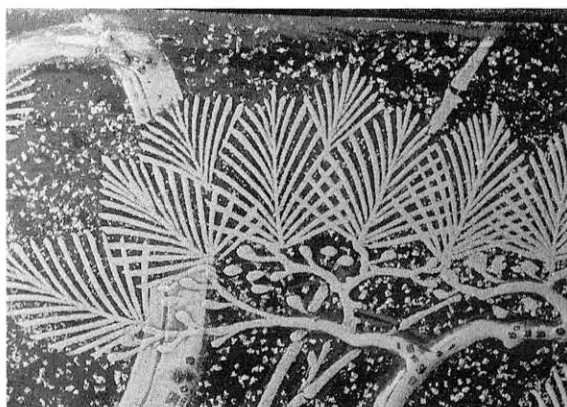
125 覆輪
Fukurin



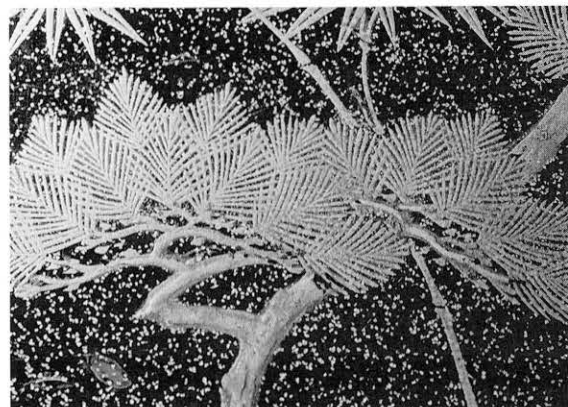
126 身覆輪 (朱色部分)
Fukurin on the body of the Box (vermilion)



127 蓋表の蒔絵
Makie decoration on the lid



128 身正面の蒔絵
Makie decoration on the front of the Box



129 蓋裏の蒔絵
Makie decoration on the inside of the lid

り、朱色と茶褐色部分の違いはでなかった。結果、鋳物でない塗料で塗られたものと判明した。覆輪に塗られた塗料は、溶剤にて除去することは可能であるが、除去した後の覆輪は光沢のある金属質になり、本資料の雰囲気損ねる恐れがあるため、当研究所の加藤氏と協議した結果、覆輪の修復は行わない事にした。(写真125、126)

修復を終えて

この手箱が制作されてから約500年の時代を経て、その間、日本とヨーロッパで7～8回程修復されていることが解かった。今回の修復を終え、分析以外に幾つかの疑問が浮かび上がった。

- ・ 蓋と身の損傷状態の相違
- ・ 蓋と身の表面漆塗膜の劣化状態の相違
- ・ 蓋表と蓋裏そして身の蒔絵の相違 (写真127、128、129)

それぞれ修復されているが、何処の部分が制作当初のものかについては確認には至らなかった。様々な疑問は残るが、2年間の修復を終え無事所蔵美術館にお返しでき、任務を果たせた気がします。今回の修復で新たに甦った手箱が後世に永く伝えつながることを願っています。

On the Restoration of “*Horai Makie Tebako*”
in the Collection of the Museum für Kunst und Gewerbe, Hamburg

MATSUMOTO Tatsuya
Urushi Conservator

Inventory number: 1904-73

Period: Late 15th-16th centuries

Measurements (cm): Length 26.8 Width 31.7 Height 17

Conservator: Matsumoto Tatsuya

The restoration of “*Horai Makie Tebako* (Box)” in the collection of Museum für Kunst und Gewerbe, Hamburg (Hamburg Museum of Arts and Crafts) was conducted at the restoration studio of the Tokyo National Museum and Restoration Studio 1 of the National Research Institute for Cultural Properties, Tokyo, over a period of 2 years (during fiscal years 2000 and 2001) as a part of the Project for Conservation of Works of Japanese Art in Foreign Collections. Restoration was completed in March 2002. This is a report on the restoration work and information obtained from it.

“*Horai Makie Tebako*” (hereafter referred to as “the Box”) was made in the late 15th to 16th centuries, during the Muromachi Period. It was given to the Museum by an art dealer named Hayashi Tadamasu in 1904. The word “*horai*” refers to an ideal land of ancient China and is explained in historical documents as the place where a hermit who has a drug that promises eternal life lives. This idea was interpreted to fit the Japanese climate. Having taken root in Japan, the theme of *horai* became a popular design for craftsmen during the Kamakura and Muromachi Periods. A famous example is the “*Horaisan Makie Kesabako*” (a box for a Buddhist priest’s robe in the collection of the Tokyo National Museum), a gift offered to Horyuji during the Heian Period. The design of the Box, whose restoration is discussed in this paper, is also believed to show the Japanese interpretation of *horai*.

The Box is approximately 500 years old and during that time, before having been taken to Europe, it had undergone several restorations.

Decoration Techniques

The Box is a rectangular container with rounded corners and *aikuchi* (parts of the lid and body that fit directly with each other). The top of the lid is shaped like a gently curving mound. The sides of the Box also bulges out somewhat. At the center of each of the two long sides of the body, there is a round metal fitting with a carved design of chrysanthemum branch and a small ring through which a cord may be passed (Photo 106).

The design on the lid is that of an embankment with pine and bamboo trees. In front of the embankment is a stream with rocks. On the rock to the left is a turtle. Also there are 2 cranes on the

embankment, 1 by the waterside and 4 in the sky. Each of the four sides of the body combined with the respective side of the lid forms a single scene. Each scene has a design of an embankment with pine and bamboo trees. There are 2 rocks on each of the long sides of the box and 1 rock on each of the short sides. The design on the inside of the lid is that of an embankment with pine and bamboo trees, cranes on both sides of the embankment, a turtle in the center and cranes flying in the air (Photo 107).

The entire Box is first coated with black urushi. The embankment on the surface of the lid and the four sides is then depicted with *marufun* and *hiramefun* sprinkled in gradation. Next, the entire surface is sprinkled with *nashijifun* using a technique of *makie* called *jimaki*. The surface is then covered with *suki-urushi*. Next, the trunks of pine trees and rocks are depicted in *takamakie*, in which *jinoko* is sprinkled to raise the design, and silver *kirikane* is applied on top of *takamakie*. This is followed by sprinkling *marufun* and doing *togidashi makie*. Finally pine trees, bamboo, cranes and turtle are decorated, using *hiramaki* technique. Although the process for decorating the sides is almost similar to that used for the surface of the lid, the material used for the pine and bamboo depicted on the sides of the lid and that of the body as well as the material used for *kirikane* on the trunk of the pine trees and rocks appear to be different. The same kind of decorative technique is used on the inside of the lid, but less *nashijifun* is sprinkled for the *jimaki* and more *suki-urushi* seems to have been applied than on the surface of the lid, causing different shades of brown color on the embankment.

Condition of Damage

1. The entire urushi coating of the Box had changed to a brownish color due to the deterioration of western coating material used for restoration in Europe.
2. The urushi coating on the surface of the lid had deteriorated, causing extensive lifting, numerous missing pieces and exposing the foundation.
3. There were many big cracks in the joints of the substrate at the corners of the lid and most of the urushi coating surrounding them had become lifted.
4. Most of the edges of the lid showed signs of previous restoration. *Suki-urushi* that had been coated had changed color and much of the surrounding urushi coating had become lifted or was missing. Overall, the condition was too dangerous to touch by hand.
5. Wax-like western coating material had been used in previous restorations in Europe to fill cracks and lifted areas.
6. The part of the trunk of the pine trees and rocks on the lid done in *takamakie* had become lifted or was missing, and the *jinoko* used to raise the design was exposed.
7. Silver *kirikane* decoration used in previous restorations had become rusted.
8. All the corners of the inside of the lid had been filled with western coating material. *Mugi-urushi* used in previous restorations to repair the *fukurin* (thin metal cover around the *aikuchi*) had not been wiped off completely.
9. The urushi coating at one place on the left corner halfway between the top and the bottom of the body had become lifted. This is believed to have been caused by the Box having been accidentally hit by something.

10. A brown coating material had been applied over a vermilion coating material on the outer side of the *fukurin*. A great amount of vermilion was exposed on the *fukurin* of the body.
11. Cracks were seen on all four corners of the *fukurin* around the *aikuchi* of the body.

Restoration Specifications

Restoration was done on the basis of maintaining the present condition of the Box. The condition of damage was examined and restoration policy was determined. Details are noted below. It was also agreed that any change would be first discussed by Kato Hiroshi, Head of the Technical Standard Section of the National Research Institute for Cultural Properties, Tokyo and Matsumoto Tatsuya, the conservator in charge.

1. The coating material that had been applied over the surface urushi coating and the material that had been used to fill the lifted urushi coating and cracks would be analyzed. Based on the result of analysis, the solvent and method for removing the coating that would not cause further damage would be determined.
2. Traces of previous restorations done before the Box was taken abroad, where the foundation could be seen to be, different from the surrounding tone and somewhat brownish, would be removed.
3. The surface of the urushi coating would be reinforced by impregnating urushi into the micro-cracks.
4. *Mugi-urushi* would be impregnated into the cracks and lifted areas. Then these parts would be press stabilized with *shimbari* sticks.
5. After impregnating *mugi-urushi*, *kokuso* would be used to fill the parts where the urushi coating is missing and where traces of previous restorations have been removed in order to reproduce their shape. Foundation would then be applied thinly.
6. Excess adhesive material on the urushi coating, which had not been removed when the *fukurin* was repaired in previous restorations, would be removed.
7. *Fukurin* would be analyzed to identify the alloy composition. The brown and vermilion coating materials that had been applied would also be identified to decide on the method of restoration.

Restoration Process

1. Survey and photographing

The present condition of damage on the structure of the wooden substrate (Fig. 105), foundation and decoration was examined and recorded to decide the restoration process. Also, photographs were taken before restoration so that they may be compared with photographs taken after restoration.

2. Curing

To prevent further exfoliation of the urushi coating during restoration, *gampi* paper cut into small pieces were temporarily attached with fresh wheat paste to areas that were in danger of becoming lifted or lost.

3. Cleaning

Dust and small pieces of fiber were dusted off with a brush, and cotton swabs or cotton cloth

slightly moistened with water was used for cleaning.

4. Analysis (western coating material)

To analyze the western coating material that had been applied on the original coating, test samples were taken by using cotton cloths moistened with water or solvent (ethanol, absolute ethanol or acetone). To analyze the material that had been filled into the missing parts, a knife was used to take samples. Analysis was conducted by Hayakawa Noriko of the National Research Institute for Cultural Properties, Tokyo. Both were identified to be shellac, material often used in Europe for restoration work.

5. Removal of shellac (surface of the urushi coating)

Since there were many micro-cracks on the surface of the urushi coating, it was feared that a strong solvent would affect the urushi coating and *makie* decorations. So different types of solvents were tested.

water (distilled water)	hard to dissolve
water+ethanol (75%)	takes time to dissolve
ethanol (75%)	dissolves easily
absolute ethanol (99.5%)	hard to dissolve due to fast evaporation
ethanol (75%)+acetone	dissolves easily

As a result, a solvent consisting of water and ethanol (75%) was used.

To remove the shellac, the solvent was applied little by little with a small piece of cotton cloth wrapped around a small piece of rubber. Utmost care and attention was paid so as not to affect the urushi coating and *makie* decorations. Also a mixture of ethanol (75%) and acetone was used for areas where the shellac was hard to dissolve (Photos 108 and 109).

6. *Urushi katame*

To reinforce the urushi coating that had deteriorated and to prevent further damage while working, *urushi katame*, a kind of consolidation treatment, was applied over the entire surface. Urushi used for consolidation was a mixture of *kijomi urushi* and *kijiro urushi* at a ratio of 1 to 4. A petroleum solvent called Cleansol G was added to dilute the mixture to 25 vol.% and brushed on the urushi coating with a flat brush so that it would permeate. Since the rust of the silver *kirikane* decoration of the pine trunk and rocks had spread into the surrounding urushi coating, care was taken not to remove the rust together with the excess urushi. Ligoïn was used to carefully wipe off excess urushi before it dried (Photo 110).

7. Removing traces of previous restoration (shellac)

The urushi coating around the edge of the lid was damaged the most, and urushi and shellac had been used for restoration. Removing the shellac with a solvent was considered, but the filling was extremely thick and it was feared that dissolving the shellac might damage the surrounding urushi coating and that there was danger of the solvent permeating into the original foundation. So it was decided to remove it with a knife. The shellac was softer than expected and was easily removed as if scraping wax. However, because the urushi coating around the area had become almost completely lifted, utmost care and attention was paid lest they fall off (Photos 16, 17, and 18).

8. Removing previous restoration (urushi from previous restorations)

Restoration work had been previously done on about 70% of the edge of the lid. Some of the parts that had fallen completely from the original *jinoko* foundation had been reproduced with *nikawa* foundation, which was applied over the original cloth, sprinkled with gold *nashijifun* and coated with *suki-urushi*. The foundation of the missing parts that had been restored previously could be seen brownish. Parts where the color was too bright were removed with a knife (Photo 111).

9. Removing the adhesive material on the inside of the lid

Mugi-urushi containing hemp fibers that was used in previous repair had been left along all the edges of the *fukurin*. A dull knife was inserted between the urushi coating and *mugi-urushi* to remove the hardened *mugi-urushi* slowly and carefully. A dull knife was used instead of a sharp one so as not to damage the urushi coating (Photos 112-116).

10. Press-stabilizing the urushi coating

A wooden frame for the Box and 2 stands for the lid - one to be used when press stabilizing the inside of the lid and another to be used when press stabilizing the outside of the lid - were made. *Mugi-urushi* adjusted to fix the urushi coating was diluted with ligroin for better permeation and impregnated under the urushi coating. After the ligroin had evaporated, a sheet of polyvinyl chloride (0.5mm) and a sheet of polymethyl metacrylate (1.0mm) were placed together on top of a flat urushi coating for press stabilization with *shimbari* sticks. For curved surfaces, a sheet of polyvinyl chloride (4mm) and a thin sheet of a slightly less flexible polyvinyl chloride (0.5mm) were used. Pressure was applied by using the flexibility of *shimbari* sticks (Photos 117 and 118).

11. Fixing the cracks

There were cracks on what appeared to be joint sections of the wooden substrate, such as at the corners of the lid and between the top and edge of the lid. An opening approximately 1mm wide was found in the joints of the wooden substrate at the left corner of the backside of the lid. The cracks were restored in the same way as the urushi coating: *mugi-urushi* was adjusted to fix the substrate and *shimbari* sticks were used to press stabilize. Urushi coating surrounding the cracks was also press stabilized (Photos 119, 120 and 121).

12. Reproducing missing parts

Areas where traces of previous restorations were removed and parts where the urushi coating was missing were filled with *kokuso* to reproduce their shape. *Kokuso* was made by kneading pine sawdust and fine powdered hemp fibers into *mugi-urushi*. This was applied several times (Photo 122). When the shape was reproduced, *jinoko* made from tiny particles of roasted diatomaceous earth, was sprinkled twice. Then to consolidate the reproduced part, *sabi-urushi* into which pine soot and red oxide were mixed was applied around the edges in a technique called *kiwasabi*. *Kiwasabi* was also applied to the cracks and urushi coating, which had been press stabilized, to prevent further loss.

13. Strengthening the urushi coating and bringing back the gloss

In order to strengthen the surface of the urushi coating and bring back the gloss, a mixture of *kijomi urushi* and *kijiro urushi* was applied for consolidation and the gloss was adjusted accordingly.

14. Box and silk wrapping cloth for storage

For storage, a fine woven silk cloth to wrap the Box and a paulownia storage box to protect the Box from drying and humidity were made.

15. Records and photographs

Restoration work was recorded and photographs were taken after restoration. With this, restoration work was completed.

Analysis of Some of the Materials Used on the Box

Along with restoration work, fluorescent X-ray analysis of some of the materials used for the decorations as well as the vermilion and brown coating materials on the *fukurin* of the lid was done by Hiraio Yoshimitsu and Hayakawa Yasuhiro of the National Research Institute for Cultural Properties, Tokyo.

Although the material used for the *kirikane* on the surface of the lid, judging from its rusty condition, is assumed to be silver, analysis showed that the material used for the *kirikane* on the body was an alloy containing tin and lead at a ratio of 9 to 1 (Photos 123 and 124).

The results of analysis of the vermilion and brown coating materials showed that both were an alloy of tin and lead with a ratio of 6 to 4. Although the colors were different, there was no difference in their alloy composition. Therefore it was assumed that the coating materials were not mineral. It was possible to remove the coating materials from the *fukurin* with a solvent, but by doing so there was danger of the gloss of the *fukurin* becoming too metallic. Upon consultation with Kato of the Institute, it was decided not to restore the *fukurin* lest it destroy the atmosphere of the Box (Photos 125 and 126).

Conclusion

It has been 500 years since the Box was made, and during that time it had been restored seven to eight times in Japan and Europe. Upon concluding this restoration, several points arose for further consideration.

- a. The difference in the condition of damage on the lid and on the body
- b. The difference in the deterioration of the surface urushi coating on the lid and body
- c. The difference in the *makie* of the outer and inner surfaces of the lid and the body
(Photos 127, 128 and 129)

Since restoration had been done several times, it was not possible to confirm the parts of the Box that were original. Although many points remain to be clarified, the present author feels that he has fulfilled his mission by having been able to return the Box safely after completing 2 years of restoration. He hopes that the newly revived Box will be transmitted for years to come.

Finally, the author would like to end this report by expressing his gratitude to all the specialists at the National Research Institute for Cultural Properties, Tokyo for their cooperation with photographing and analysis and to everyone else for their useful advice.