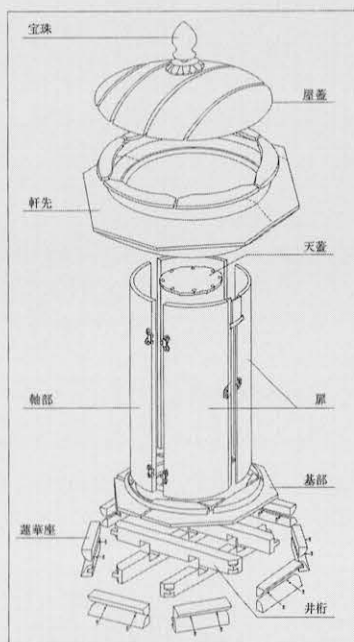


大般若経厨子

平成11年度修復事業



品名：大般若経厨子

所蔵：クリーブランド美術館 アメリカ合衆国

品質構造：木製、漆塗

所蔵番号：444352055／1

請負者 北村昭斎

修理担当者 北村昭斎

原稿執筆 北村昭斎

大般若經厨子



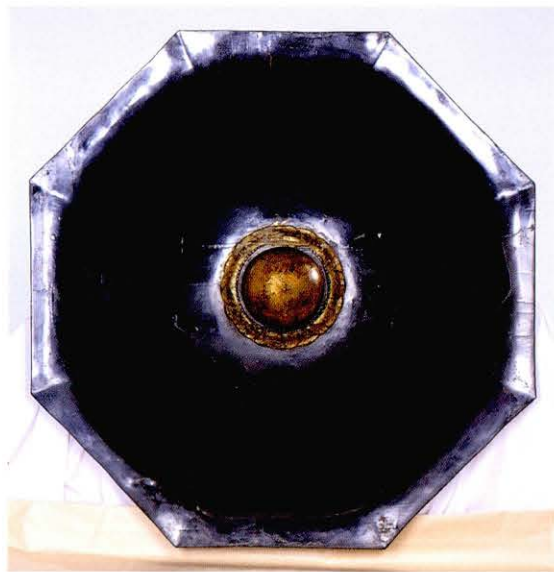
1 大般若經厨子 (内部部分)
"Dai-Hannyakyo Zushi" (part of the interior)



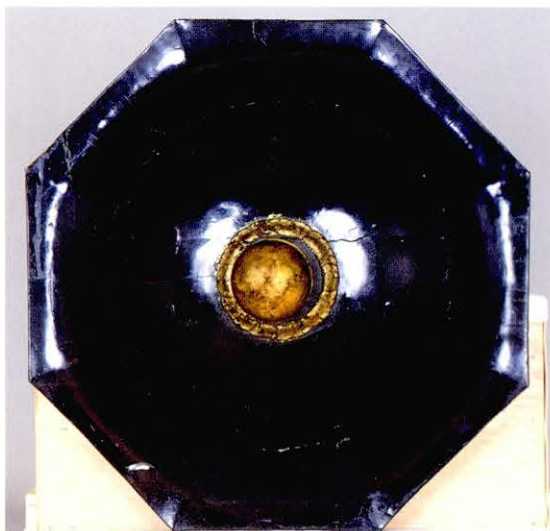
2 大般若経厨子 (修復後)
"Dai-Hannyakyo Zushi" (after restoration)



3 大般若経厨子 (修復前)
"Dai-Hannyakyo Zushi" (before restoration)



4 屋根 (修復後)
Roof of the shrine (after restoration)



5 屋根 (修復前)
Roof of the shrine (before restoration)



6 底部 (修復後)
Underside of the shrine (after restoration)



7 底部 (修復前)
Underside of the shrine (before restoration)

米国クリーヴランド美術館に所蔵されている「黒漆大般若経厨子」この厨子は、平安時代末から鎌倉時代に造られたと考えられる。この厨子がクリーヴランド美術館に所蔵されたのは、同館の収納記録によると、1969年1月30日に既に購入されたという事であり、戦後に日本側から購入という形で同館に納まっている。この厨子は、工芸品としては大きなもので高さ160cm、基部の中が98cmありほぼ人間の身体の高さとそれ以上のボリュームを持ったものである。この事業は平成9年度よりスタートし、2000年3月31日で修復完了した。

厨子の品質形状

木造黒漆塗厨子、頂に宝珠を置く。八角形の屋蓋、円筒形の軸部、八角形の基部から成り、軸部正面を両開扉とする。高さ160cm。基部巾98cm。

宝珠 蓮華座に柄で差込み取外し可能。

布着せ無く黒漆塗の上に金箔を貼り、その上に透漆を塗る。

屋蓋 八角形で甲盛り上下二材矧とし、上部は正面に対し横木目に、下部は縦木目に数材矧で内面を大きく刳る。軒裏には八葉の花弁とその間からのぞく三鈷杵^{附1}（図33）を浅く彫り、軒下に十六葉複弁の蓮華を作り出す。

粗い麻布着せに厚い漆下地を施し黒漆を塗る。軒先返花部など各所に金箔を押す。

軸部 円筒形屋蓋に接合されていて、縦方向に木目の通った材を数材矧、円弧に削り、穏やかな膨らみを持った形に造る。このような形は平安時代にみられる経塚出土の円筒形の経筒の類似品と思われる。背面の材を柄として、基部に差し込み固定させる。正面は各々縦に三材矧（または数柄）を円弧に削る。各扉の上下四か所に金銅製の羯磨形螺番^{附2}（図34）を打つ。螺番は当初のものと思われるが、右下金具の扉側と左上金具に一部分欠損があり、金具の欠損部に釘が残っている。

粗い布着せの上に厚い漆下地を施し、黒漆を塗る。両扉の合わせ目に金銅製輪宝形座金具^{附3}（図35）が付されている。上部には蓮華座上の長方形区画に「大般若経／四百内／五百内／六百内」（図36）と毛彫りした金銅製の題籤を付している。

軸部内面を白群に塗り奥壁の中段左右に蓮華座に乗り円相内に納まる種字^{附4}（図37）が見られる。

蓮華座の蓮弁は朱、蓮托は白緑、円相は白、種字は墨、奥壁中央の上下三か所には四花形座、切子頭環台、丸環から成る鉄製黒漆塗金具を打ち、（経巻を三段に重ね束ねて紐で縛る為に用いられたものと思われる。）金具の足を背面に突き出し、折り返したうえに布着せをし、漆下地を施して黒漆を塗る。

扉内面は周縁に金箔押しして独鈷杵文^{附5}（図38）を表し、地は白群、床を白緑に截金で石畳文を表し、左右扉に十六善神像をそれぞれ四体ずつ彩色は墨、緑青、群青、白緑、白群、朱、丹、金泥、銀泥、截金、截箔などで行っている（図39・40）。

天井には八花弁形に造り、朱、緑青。群青、金箔、截箔などで宝相華と蓮華を表した花形天蓋を嵌め（図41）（ボルトにより屋蓋に取外し式）、軸部の上縁長押部分には金銅唐草文を透彫した帽額金具を廻し、金銅透かしに瑠璃を飾った瑤珞^{附6}を吊るす。

基部 底に角材で井桁を組み天板前後三材矧とし、八材を寄せて成型した仰蓮、返花の二重蓮華座上に十六葉蓮華座を重ね、さらに軸部内にも三本の角材を組んだ桁上に天板を三材



図33 屋蓋裏の三鈎杵
Sanko-sho on the downside of the roof



図34 羯磨形蝶番
Katsuma-shaped metal fitting



図35 輪宝形座金具
Rimpo-shaped gilt bronze ornament



図36 題簽
Title plate



図37 種字
Sanskrit letter

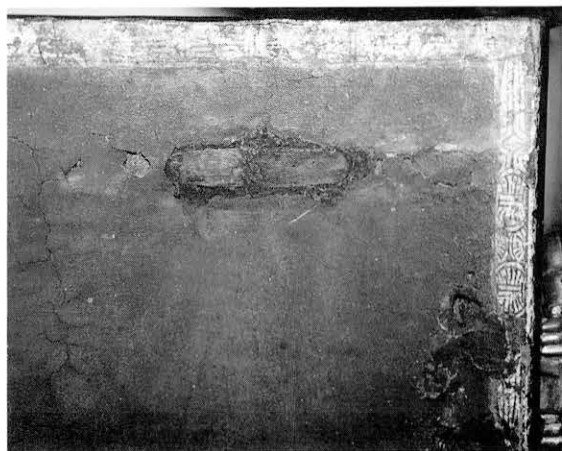


図38 独鈎杵文
Dokko-sho design



39-1



39-2



39-3



39-4

図39 十六善神像 (左扉)
Left door with 4 god figures



40-1



40-2



40-3



40-4

图40 十六善神像 (右扉)
Right door with 4 god figures

矧とし周縁に八材を寄せ、上面四方に孔を穿った十六葉蓮華座の円盤を据える。

他の部分と同様に外面は麻布着せに漆下地を施し黒漆を塗る。

この厨子は京都神光院伝来といわれ同形の重要文化財 大般若経厨子（奈良国立博物館蔵）と一具をなしていたもので、当初は大般若経三百巻を百巻ずつ三段に納置していたと推察される。現在は同館蔵の厨子に166巻が付属している。

同じ厨子の十六葉蓮華座の円盤裏面に花押の墨書、天蓋裏面、屋蓋裏面にもそれぞれ異なる花押の墨書が認められており「建久十」（1199）と墨書された断片が見出され厨子の製作年代を考える上で貴重な参考資料となっている。

厨子の破損状態

宝珠 蓮華座に虫蝕が全面に見られ（図42）木目に沿っての割れ、欠損、素地の空洞化のため、塗膜の欠損も各所にある。

屋蓋 素地の矧目の割れのため、塗膜の剥落と共に素地の矧目に大きな隙間が生じている。又、矧目を接合するために埋め込んだ柄が2ヶ所あるが、実際にはつなぎの役割を果たしていない（図43）。

天蓋 素地の矧目に沿って布着せして補強してあった所が割れ、花形の一部分が欠失している。当初は花卉数ヶ所に鉄釘を打ち、それに紐を結び、屋蓋内側から釣り下げていたと思われる、錆びた鉄釘が残っている（図45）また裏面に天蓋を屋蓋に取り付けるために後補鉄製のボルトが取り付けられている（図44）。

軸部 本体側の状態は良好であるが、扉側は木目方向に対して直角に塗膜に細かい断文が生じ木目に沿った亀裂もある。一部分欠損箇所の後補の埋木があり素地肌のままとっている。

内部の彩色面は安定しているが下の漆塗膜の割れが彩色面に及んでいる所もある。

左側金具の鑲が欠失している。軸部内に据えられた十六葉蓮華座円盤の一部が塗り直され、銀化している。また、各所に虫蝕いによる欠損がある（図46）。

基部 天板の矧目と八材を寄せた蓮華座の接合部が素地から割れ、塗膜が大きく剥落している。また各所に虫蝕により欠失した所もあり、蓮弁の欠失箇所の後補の蓮弁が接合されている。蓮華座の水平位置がずれている所もあり、平成9年4月に催された「奈良国立博物館名宝 一世紀の軌跡」への出品に際し、分離していた蓮弁先の一部を応急的に麦漆で接着し、隙間に木屎漆を充填した（図47）。

底面に後補の薄手の合板が木ネジによって張り付けられているが、これを外した所、井桁に組まれた各材及び周縁の蓮華座の八材が虫蝕により空洞状になっていて、厨子全体の重量を支える役割を果たしていない。これを支持するために応急的に鉄製のアングル（図48）が組み込まれ、数本の洋鉄釘が打たれている。又、虫蝕部分の所々に修理のために黒色の樹脂を浸透させたと思われる箇所がある。この樹脂修理についての記録はクリーブランドには残されていない。



図41 天蓋
Ornamental canopy

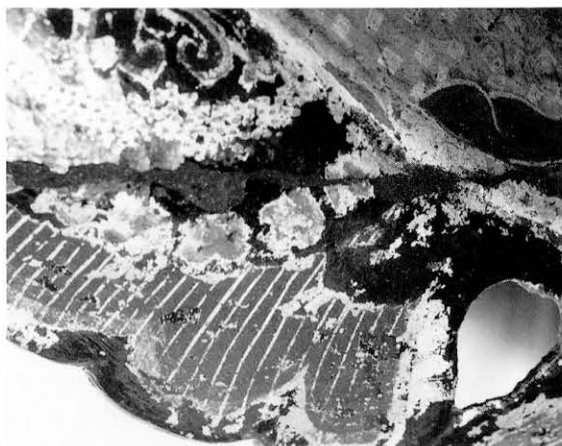


図44 天蓋の亀裂
Cracks on the ornamental canopy



図42 虫損のある宝珠蓮華座
Lotus pedestal with holes made by insects



図45 天蓋をとり付ける鉄釘
Iron nail used to attach the ornamental canopy

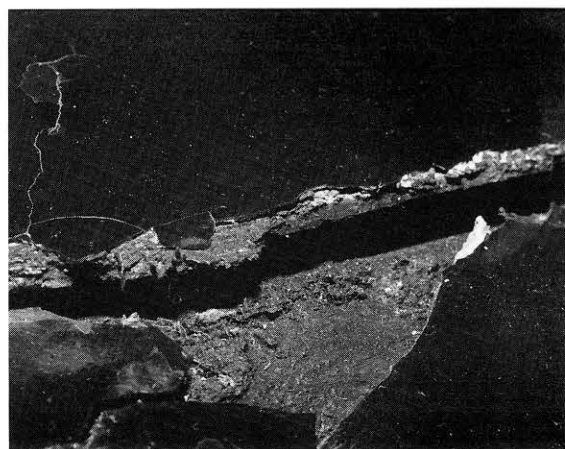


図43 屋蓋の割れ
Cracks on the roof

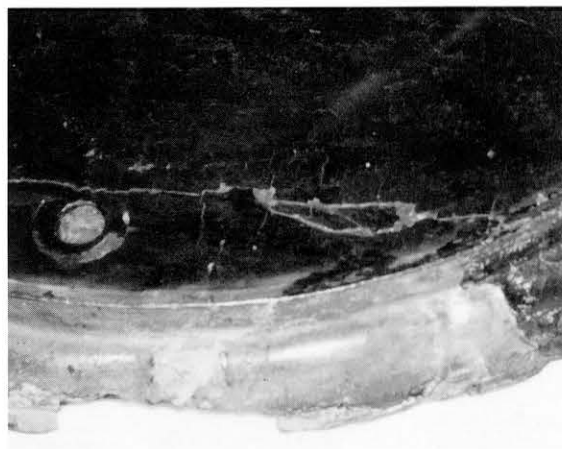


図46 虫損部分
Front of the top board of the base damaged by insects

修理計画及び仕様

修理者が東京国立文化財研究所 第一修復技術研究室長 加藤 寛氏の指導により、所蔵者のクリーヴランド美術館 日本・朝鮮部門のキュレーター、カニンガム博士、及び保存担当のクリスマン氏と打ち合わせの上、3カ年にわたる各年度毎の修復計画を立てた。

統合修復計画

- (1) 修理は日本の国指定文化財に適応される現状保存修復の原則に基づいて行うが、返却時の空輸の衝撃に耐え得る構造上の強度と、同館が文化財のために適切な温湿度条件を保っているものの、日本よりも乾燥する地域である事を考慮して、それに耐え得る構造上の補強を行うこととした。このため、一旦解体し、強度上弱っている所は十分に補強する。解体時に横倒して底に貼られている合板を外した(図49)ところ、全重量を支える井桁部分が永年の湿気の浸透と虫蝕によって、重量を支えるに耐えない状態となっていたため、新しい部材と取り替え、古い材はそのまま返却、保存する事とする。基部の蓮華座を成す框も相当な虫蝕があり、一部空洞化している箇所もあるが、外形の蓮華座のオリジナルな形を残して、適切な方法で補強する。
- (2) 蓮華座 天蓋の花先の欠損箇所の形状復元は行わない。
軸部、扉、内側に描かれた絵画彩色は安定しているので原則的に修理しないが、漆塗膜の欠損、亀裂等で剥落の進行する恐れのある所は適切な方法で剥落止めを行う。
- (3) 金具の欠損は新しく補わない。
- (4) 現在天蓋を取り付けている金属のボルトナットに代わる適切な取り付け方法があれば検討する(図50)。
- (5) 現在取り外す事が出来る宝珠は(奈良国立博物館所蔵の厨子は屋蓋に固定されている)運搬時の便宜上、現状通りの取り外し式とする。

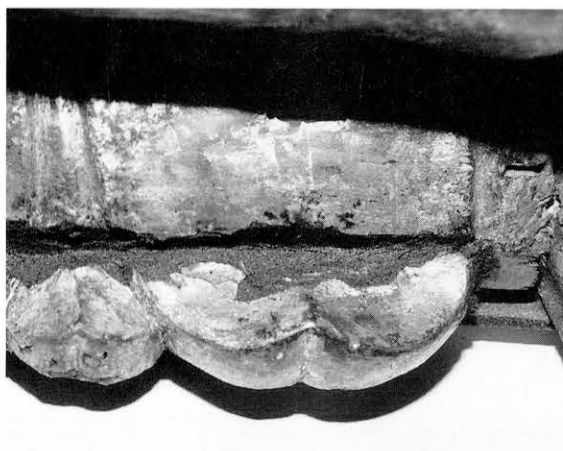


図47 木屑を充填
Filling kokuso



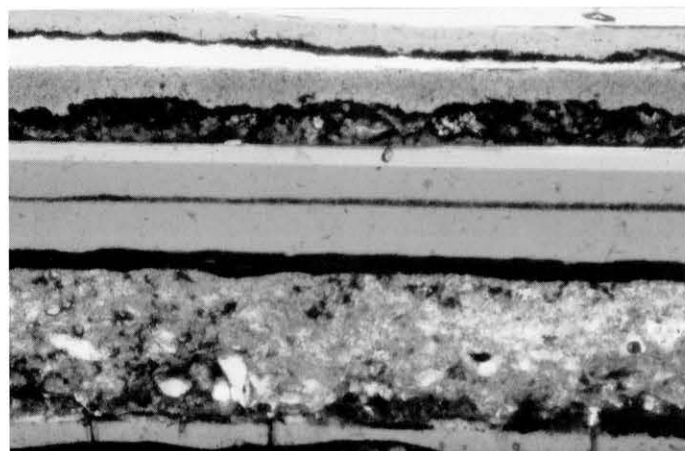
図48 鉄製のアングル
Iron angle bar



図49 解体のため底部合板を外す
Taking off the plywood board in disassembly

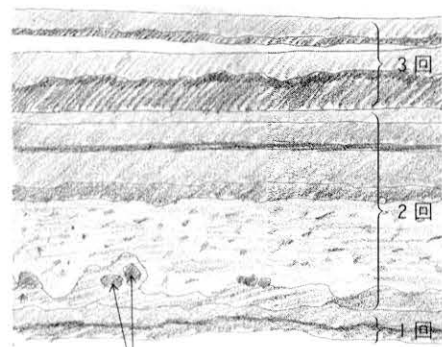


図50 天蓋を取り付ける金属ボルトナット
Metal bolt and nut used to attach the ornamental canopy

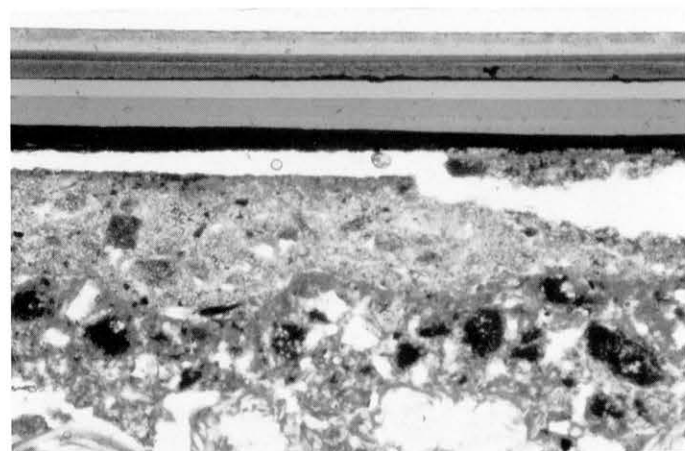


51-1

図51 屋蓋部クロスセクション
Cross section of urushi layers of the roof

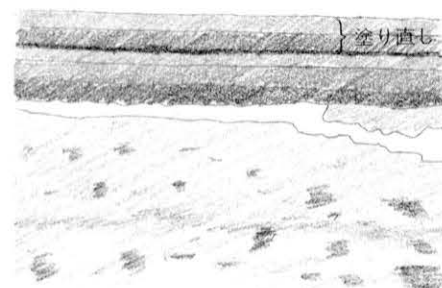


51-2



52-1

図52 基部クロスセクション
Cross section of the base



52-2

- (6) 基部蓮華座の花先が移動の際に折れて欠損する危険があるため（現在、既に欠損したところが数箇所ある）保護用の置台を新しく作る。
- (7) 厨子の殺虫は過去に行われていると思われるが（虫の死骸が見つかる）念のために返却時にエキボンガスによる殺虫を行う。
- (8) 修復進行上問題が生じた場合、関係者で打ち合わせる。
- (9) 修復事業についての記録を写真、ビデオ、図面で行う。

<平成9年度修復計画>

- (1) 平成9年に奈良国立博物館が開催した「奈良国立博物館の名宝——世紀の軌跡——」展の開催の際してクリーヴランド美術館から借り入れ、同展終了後に新しく完成した東2新館地階修理室に移動し、そこで修理を行う。なおこの事業に対し、奈良国立博物館の全面的な協力により、修復期間中の修理室は無料で貸与された。
- (2) 厨子の移動（日通美術運送担当）、調査及び修復作業のための横倒し用作業台の製作（日通担当）。
- (3) 修復前の破損状態及び材質、構造、形状を写真及び図面によって記録。
- (4) 漆乾燥用装置の製作。
- (5) 修復材料の購入。

<平成10年度修復計画>

- (1) 破損現状の記録図の作成。
- (2) 破損箇所の細部の写真撮影。
- (3) 屋蓋塗膜の養生。
- (4) 屋蓋、破損塗膜を一担剝離し、記録図面の所定の場所に仮貼りする。
- (5) 屋蓋、基部の解体、組立て構造図の作成。
- (6) 虫蝕、欠損箇所の補強、充填を木屎漆を用いて行う。
- (7) 大きな素地欠損部分には適当な檜材を補充して形状を復元する。
- (8) 解体した素地を当初の形状に、麦漆、木釘等を用いて組立てる。
- (9) 素地の調整を木屎漆、漆下地で行う。



図53 厨子の移動
Transporting the shrine



図54 屋蓋の素地と塗膜の破損状態
Damage to the substrate and urushi coating of the roof



55-1



55-2

図55 扉の彩色部分と金具回りの破損修復後

Polychroming on the doors and damage to the area around the metal fitting (after restoration)



56-1



56-2

図56 同修復前

Polychroming on the doors and damage to the area around the metal fitting (before restoration)

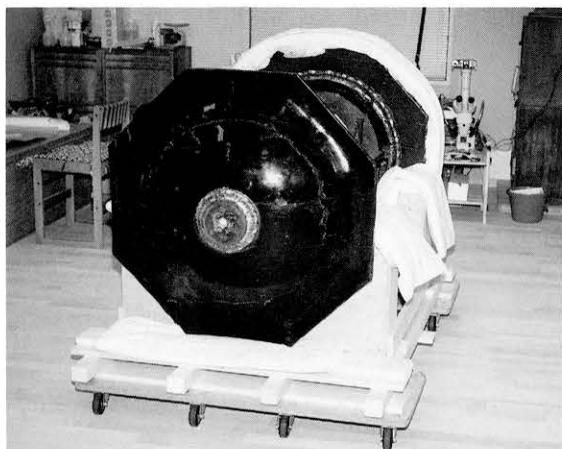


図57 横倒し用作業台
Workbench for laying down the object on its side



59-1

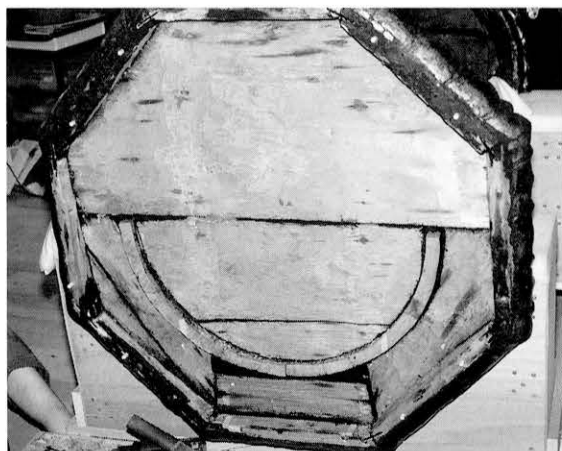
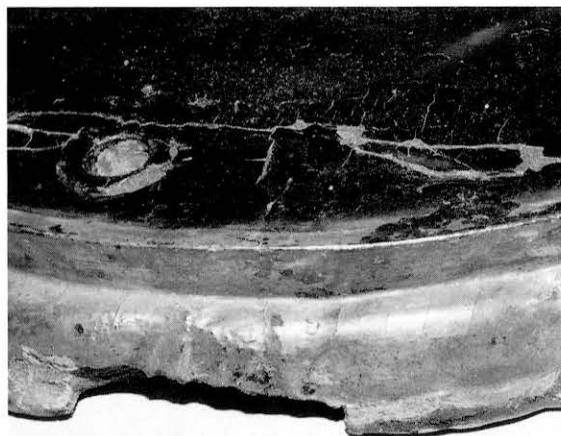


図58 軸部と基部の関係
The body and the base



59-2

図59 十六弁蓮華座
16-petal lotus pedestal



図60 天蓋の状態
Condition of the ornamental canopy



図61 屋蓋の破損状況
Damage to the roof



図62 宝珠の状態
Condition of the holy jewel

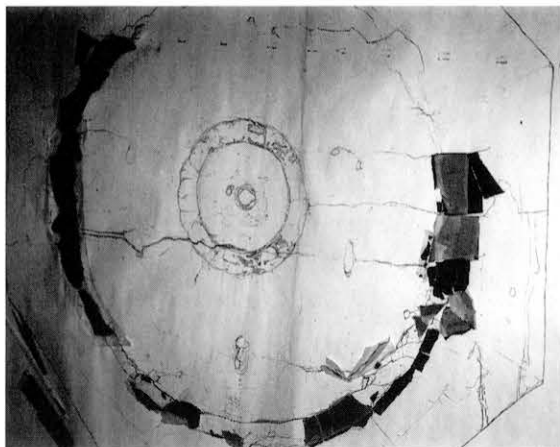


図64 解体前の屋蓋現状図面
Drawing showing the current state of the roof
before disassembly



図65 屋蓋の塗膜の剝離解体作業
Removing the urushi coating on the roof



図63 屋蓋の解体の前に塗膜を養生する
Protection of the urushi coating of the roof before
disassembly

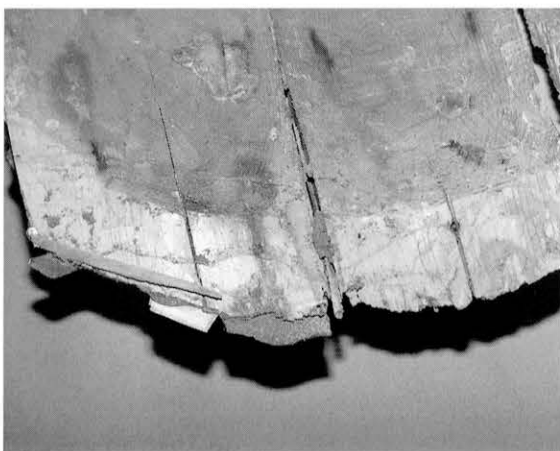


図66 解体された屋蓋の裏面
Downside of the disassembled roof

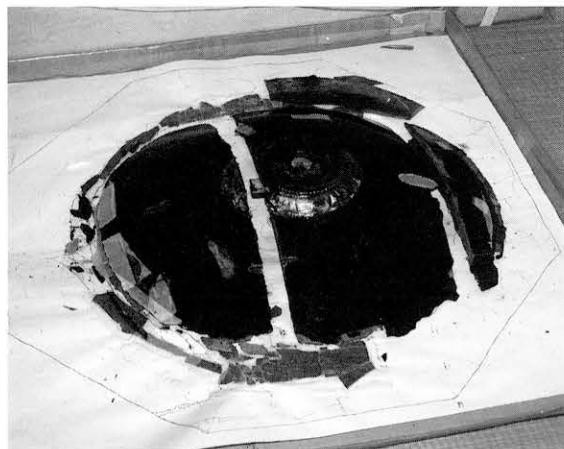


図67 現状図の所定位置に仮貼りした塗膜
Urushi coating positioned temporarily to the
places designated in the drawing of the current state



図70 屋蓋の素地割目に打たれていた鉋は錆びて劣化している
Iron clamp on the joints of the roof



図68 塗膜を剥がした後の屋蓋の素地の状態
Condition of the substrate of the roof after the
urushi coating was removed



図71 ノミのたたき台として使用された屋蓋
Marks of chiseling on the wooden joint board



図69 空洞状の素地と隙間にはめ込まれた小木片
Hollowed substrate and wooden fragments in the opening



図72 基部の破損状態
Damage to the base

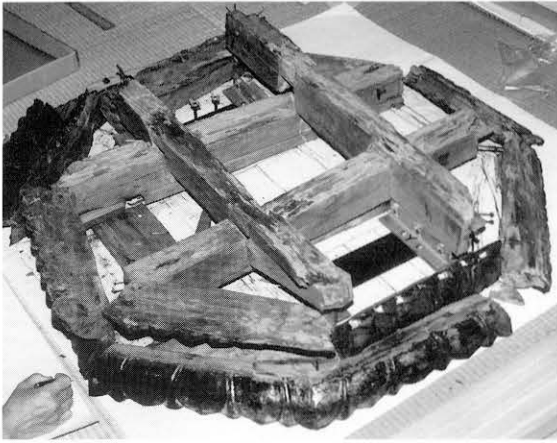


図73 解体された蓮華座と井桁
Disassembled lotus pedestal and *igeta*



図74 虫蝕によって素地部が欠損した蓮華座
Substrate of the lotus pedestal damaged by insects

- (10) 新しい檜材の井桁を作り虫蝕のある古い井桁と取り替える。
- (11) 剥離した屋蓋の塗膜を元の位置に麦漆で貼り付ける。
- (12) 塗膜の割れ目を木屎漆、漆下地で調整する。
- (13) 漆膜細片（屋蓋、基部）のクロスセクション（塗膜断面 図51-1、52-1）を作り、顕微鏡写真観察によって、塗膜の塗装工程を調べる。

〈平成11年度修復計画〉

- (1) 修復箇所の漆下地の研磨。
- (2) 修復箇所の漆塗り。
- (3) 保護用の設置台を新しく作り、漆塗りを行う。
- (4) 修復後の写真撮影。
- (5) 修復作業記録の作成。
- (6) 厨子の殺虫。
- (7) 返却。

以上の通り、修復計画を立案したが、修復作業の進行に従って、生じた問題を解決しながら臨機応変に作業を進めて行った。

修復作業工程と記録写真

- (1) 厨子の移動 奈良国立博物館展示室から修理室へ。立合いクリーヴランド美術館 カニンガム氏、奈良国立博物館 梶谷氏、日通。(図53)
- (2) 宝珠 蓮華座の虫蝕状態。(図42)
- (3) 屋蓋 素地の破損と塗膜の破損。(図54)
- (4) 厨子軸部の内面彩色部分の状態、上からの雨水によるとと思われる種字の彩色の汚れ。(図37)
- (5) 扉、彩色部分と金具回りの破損。(図55-1)
- (6) 天蓋の彩色と汚れと変色 (図41)、素地の破損。

(7) 天蓋の取り付け用金属製ボルトナット。

この取り付け方法についてはいろいろと検討した結果、現行の方法が取り付けの簡便さ、安定性で最良のため、現在使用されている金具に、漆塗を施して周辺と調和するように仕上げる。(図50)

(8) 横倒し用作業台と乾燥用装置。(図57)

(9) 基部、底から見た解体前の状態。(図49)

(10) 合板を外した底の状態。(図7)

(11) 軸部と基部の関係。(図58)

(12) 軸部内の十六弁蓮華座円盤とその状態。(図59-1)

(13) 天蓋とその状態 表 裏。(図60)

(14) 屋蓋の構造とその状態。(図67、93、111)

(15) 屋蓋の破損状態。(図61)

(16) 宝珠の状態。(図62)

屋蓋の解体作業と記録写真

(1) 解体前に塗膜を養生する。(図63)

(2) 解体前の現状図面。(図64)

(3) 屋蓋の解体と塗膜の剥離作業。(図65)

(4) 解体された屋蓋の裏面。(図66)

(5) 現状図の所定の位置に仮置きをした塗膜。(図67)

(6) 塗膜を剥がした後の素地の状態。(図68)

(7) 空洞状の素地と隙間にはめ込まれた小木片。(図69)

(8) 解体した屋蓋。当初は上下二材矧と考えていたが、上下材の間に薄い六枚の寄木材があり、この材の接合部が素地の収縮と釘の劣化のために素地が分離し塗膜が大きく破損した事が解体してみて判明した。

(9) 錆びて劣化した鉄釘と鋸。(図70)

(10) ノミのたたき台として用いられた屋蓋板に挟み込まれた六枚の寄木板。(図71)

基部の解体作業と記録写真

(1) 解体前の基部塗膜面。(図72)

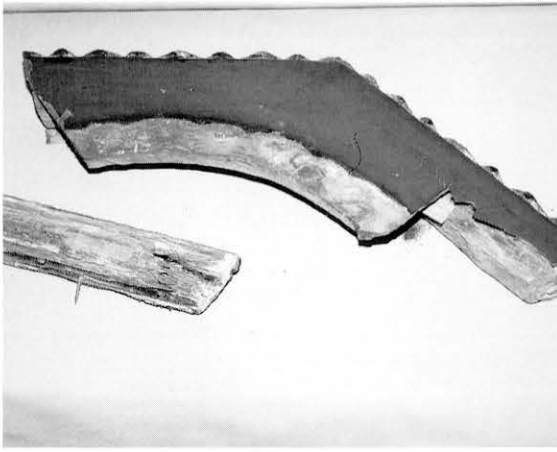
(2) 解体した蓮華座と井桁。(図73)

(3) 虫蝕によって欠損した蓮華座框。(図74)

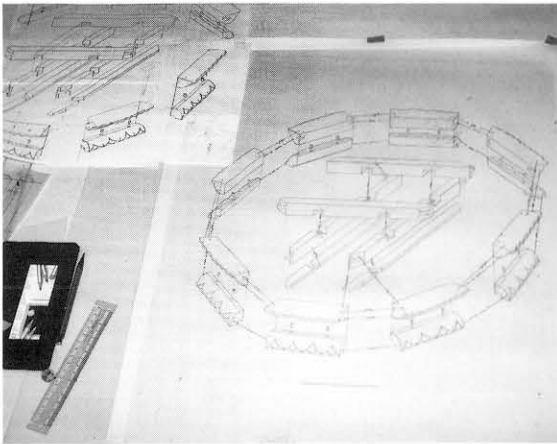
(4) 解体した蓮華座框と取り外した基部天板と井桁及び框の組み立て構造図。(図75-1、76-1)

基部の組み立てと修復と記録写真

(1) 蓮華座框の虫損部分に檜の細い棒を差し込みその隙間に木屎漆を埋めて強度をもった形に復元した(図76)。(このアイデアは鉄筋コンクリートの構造に似た方法によるものである)



75-1



75-2 図75 井桁・框の組立て構造図
Damage to the *igeta* and frame board

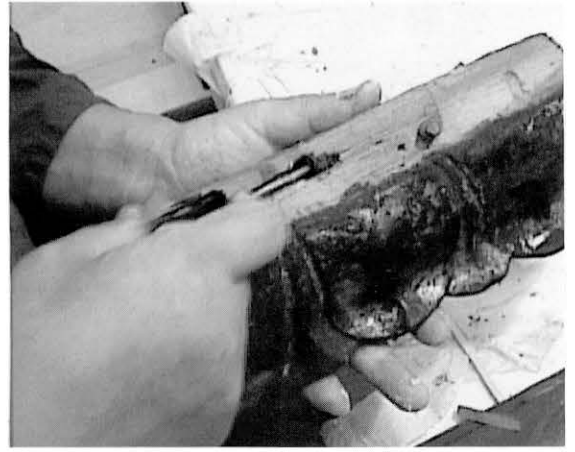


図77 隙間に木屑漆を埋める
Filling *kokuso* in the joint between the upper and lower lotus pedestals

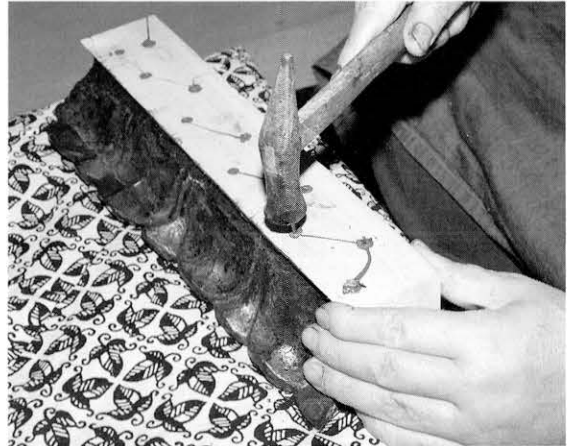


図78 大きな欠損部に新しい檜材を補った
New cypress board added to a large missing part

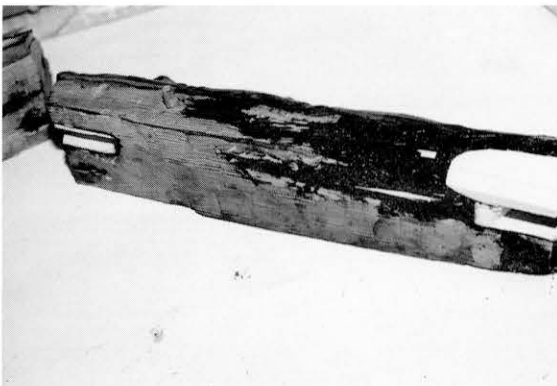


図76 虫蝕部分に檜の棒を差し込む
Lotus pedestal with its lost places filled with new Japanese cypress wood

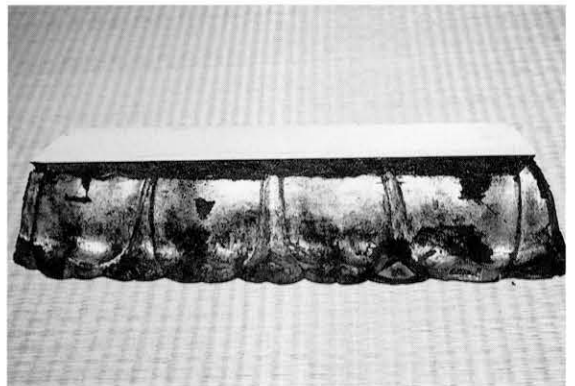


図79 檜材を補った蓮華座
Lotus pedestal with new cypress board



図80 真鍮製の木ネジ
Brass screw

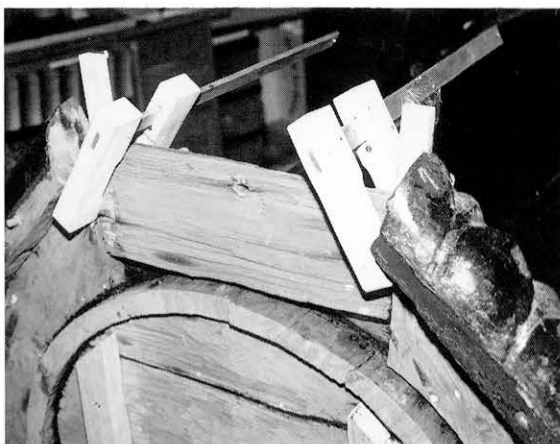


図83 基部及び蓮華座の組立て作業
Assembling the base and the lotus pedestal

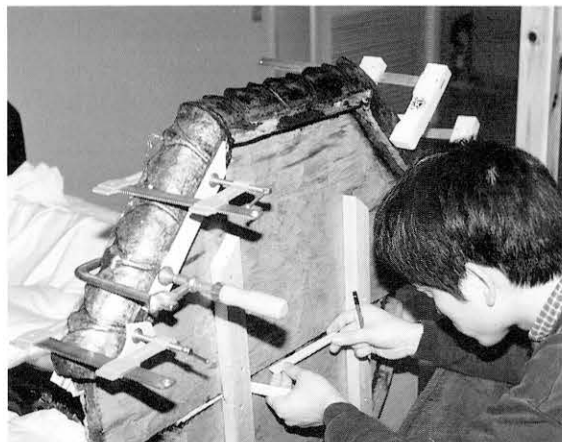


図81 隙間を木片で補強
Reinforcing an opening with cypress chips



図84 基部の欠損部に木屑漆を充填
Filling *kokuso* to missing parts on the base



図82 木屑漆を充填
Filling *kokuso* to the base



図85 上段蓮華座の接合部に新しい鉋を打つ
Placing an iron clamp to the upper lotus pedestal

この作業はビデオで記録した。(図77)

- (2) 大きな欠損部は新しい檜材を木釘と麦漆で接合して補った。(図78、79)
- (3) 軸部と基部天板との間には大きな隙間があり、非常に不安定であるため、軸部の側面から基部板に真鍮製の木ネジ(図80)をねじ込んで支持し、その隙間に木片や木屎漆を充填して補強した。(図81、82)
- (4) 基部及び蓮華座の組み立て作業。(図83)
- (5) 基部の欠損部に木屎漆を充填する作業。(図84)
- (6) 基部の上段蓮華座の仰蓮の框の接合部分に打ち込んだ新しい鍔。(図85)
鍔の成分表(薬師寺金堂復元に用いられたものと同材質)(図86)
- (7) 取り外した虫蝕のある古い井桁と新しく檜材で作られた井桁(図88)、新しい井桁には元の井桁と同様に柄を作る。(図87)
- (8) 下段蓮華座(反花)の接合。(図89、90)
- (9) 下段蓮華座の框の底にも新しい鍔を打つ。
- (10) 井桁の組込み作業。(図91、92)

屋蓋の組み立てと修復・扉の修復・全体の仕上げと記録写真

- (1) 解体した屋蓋を元の位置に麦漆と木釘を打って接合した。接合方法としてまず各部材に麦漆をつけ貼り付けた後に木ネジで数箇所を締め付ける(図93)。麦漆が乾いて接着した後に木ネジを抜きその穴に麦漆を入れウツギの木釘を打ち込んだ。(図94)
- (2) 剥離した塗膜を元の位置に麦漆で貼り付けた。(図95)
- (3) 貼り付けた塗膜の隙間に漆下地を付けた。(図96)
- (4) 漆下地が付けられた屋蓋。
- (5) 屋蓋の修復部分に漆を塗る。(図97)
- (6) 修復された屋蓋全体。(図98)
- (7) 修復された屋蓋部分。(図99)
- (8) 扉の漆塗膜の亀裂。(図100)
- (9) 大きな亀裂の欠損部分には木屎漆を充填、漆下地、漆塗を行う。また細かい塗膜の割れ目には生漆を浸透させ補強する。(図101)
- (10) 修復された扉。(図102)
- (11) 扉内面の蝶番金具足の周辺の漆塗膜の欠損部分に木屎漆を充填し補強する。
- (12) 木屎漆の色の黒さを和らげるためにダイヤモンド リューターで木屎漆の表面を研磨する。(図103)
- (13) 基部蓮華座の花先を保護するための拭漆をした檜材の置台を組み込む。この置台は、底面2ヶ所に木ネジで井桁に装着し、取り外す事ができる。
- (14) 修復された基部蓮華座と置台との状態、厨子の全重量は新しく組み込まれた井桁に掛かるようにし、空輪時に蓮華座に負担が掛からないように置台より少し浮かしてある。(図104)
- (15) 修復された基部 上面。(図105-1)
- (16) 修復された軸内十六華蓮華座円盤 表 裏 部分。(図59-2)



1. 化学成分 (wt%)

区別	C	Si	Mn	P	S	As	O	N
旧標準	0.05 ~0.12	0.03 以下	0.03 以下	0.010 以下	0.002 以下	0.005 ~0.010	—	—
リード材	0.005	0.01	0.01	0.001	0.002	0.001	0.0029	0.0042
リード材 (その他)	Cu	Ni	Cr	As	Ba, V, Ti, Zr, Nb, Bi, Sn, Sb			
	0.01	0.02	0.01	0.002	全て - 0			

図86 鋸の分析表
Table showing the composition of iron clamps

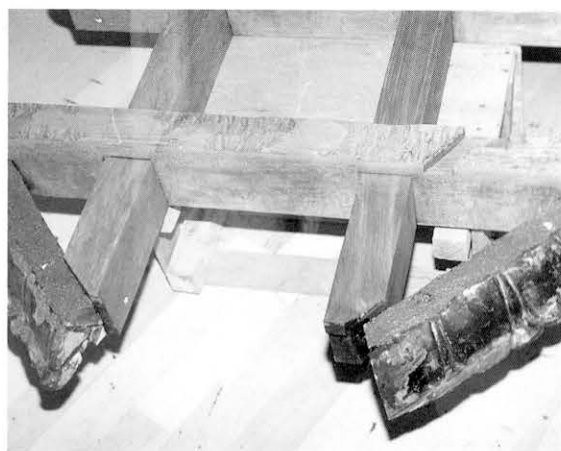


図89 新調した井桁と蓮華座の組み込み
Temporary assembly of the new *igeta*



図87 枘の作成
Making a mortise on the new *igeta*



図90 上段蓮華座と返花の接合部の隙間に木屎漆を充填
Assembled new *igeta*

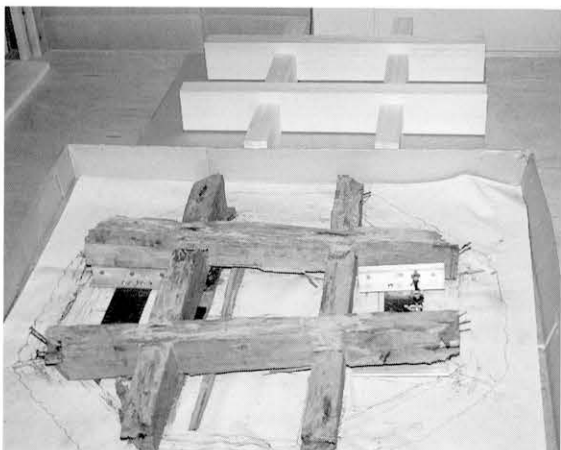


図88 虫蝕のため空洞状になった井桁と新しい檜材の井桁
Old *igeta* bars with its substrate hollowed by insect damage and new *igeta* made of *hinoki* wood



図91 新調した井桁の仮組み作業
Assembling new *igeta* into the base

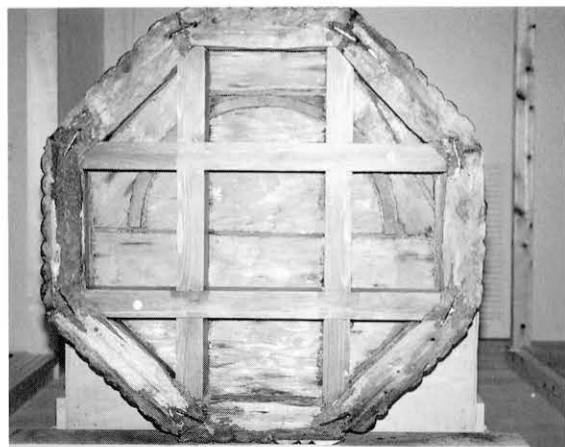


図92 組込まれた新しい井桁
Assembled *igeta*



図95 剝離した塗膜を麦漆で貼りつける
Re-fixing exfoliated coating film



図93 麦漆で貼り付け木ネジで締めつける
Using *mugi-urushi* and screws for fixing



図96 貼り直した塗膜の隙間に漆下地を施す
Filling *urushi* foundation into openings



図94 木釘の打込み
Driving wooden nails

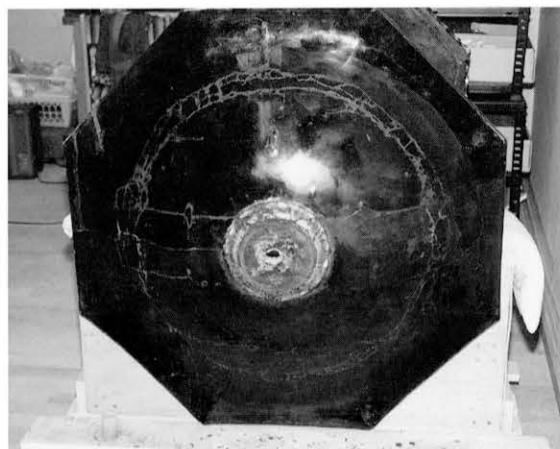


図97 漆下地がつけられた屋蓋
Roof with *urushi* foundation applied

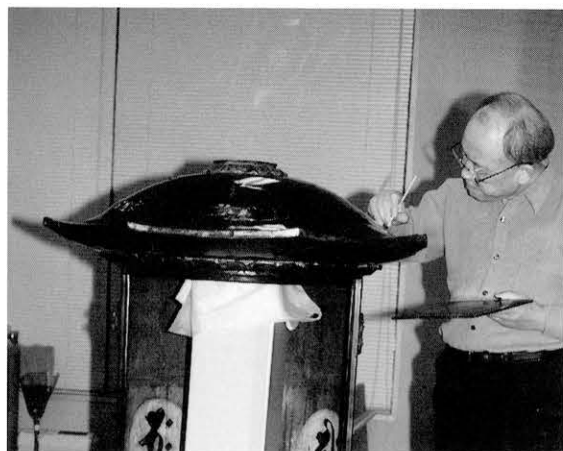


図98 隙間に漆下地を施した屋蓋
Applying urushi foundation to the roof



図101 塗膜割れ目の補強
Reinforcing cracks on the coating film



図99 修理された屋蓋部分
Roof after restoration

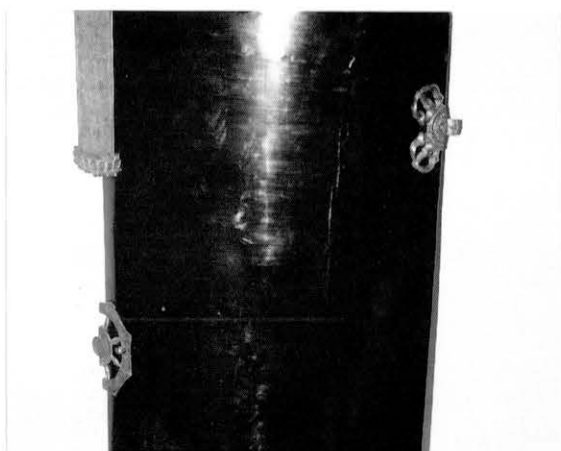


図102 修復された扉
Door after restoration



図100 扉の塗膜の亀裂
Cracks on the door



図103 木屎表面の研磨
Polishing the surface of kokuso



図104 基部と置台のすきま
Opening between the base and the receptacle



図106 金属ボルトにも漆を塗る
Applying raw urushi on the metal bolt



105-1



図107 修復後のエキボンガスによる殺虫
Killing insects with Ekibon gas after restoration



105-2

図105 修復された基部
Base (before restoration)
Base (after restoration)



図108 修理完了の確認
Examining the shrine after restoration work

(17) 修復された天蓋 表裏部分 金属製のボルト ナットには漆を塗る。(図106)

(18) 修復された厨子 全体。(図2)

(19) 修復後のエキボンガスによる殺虫。(図107)

(20) 殺虫作業記録。

この厨子は、修理完成后、クリーブランド美術館修復部クリスマン氏と加藤寛氏、奈良博工芸担当内藤栄室長、伊東哲夫氏によって修理完了を確認された後(図108)、2000年4月29日より5月21日まで、奈良国立博物館に於て、奈良博所蔵の同形厨子と共に展示公開された(図109)。展示終了後、直ちに日通によって梱包、空論された。(図110)

参考資料

(1) 厨子 塗膜層の断層顕微鏡写真 屋蓋部分 屋蓋部分には三層の漆塗工程層があり、二度全体に塗り直された可能性があること、また二回目の塗りの下地層の中に緑青が混入している。(図51-1、52-2)

基部分

(2) 解体によって判明した厨子の組立構造図。(図111)

(3) 修復。

木地製作：坂本曲斎

漆工助手：中條伊穂理、北村繁、小西寧子

殺虫：エフ三益^{みみつ}、井上俊蔵

写真撮影：飛鳥園、後藤親郎^{ちかお}

クロスセクションの製作、撮影：岡田文男

殺虫記録

(1) 燻蒸対象物：厨子等

(2) 燻蒸目的：殺虫(卵・幼虫・蛹・成虫)、殺カビ

(3) 燻蒸施行場所：奈良国立博物館

(4) 施行場所住所：奈良市登大路町50

(5) 燻蒸容積：約9 m³

(6) 施行実施日：平成 年 月 日～ 月 日

(7) 施行方法：(1) 燻蒸方法……包み込み法

(2) 使用薬剤……エキボン

(3) 燻蒸時間……24時間

(4) ガス濃度……60 g/m³以上維持

(5) 投薬方法……防爆型気化器使用

(6) 排気方法……活性炭吸着除毒後ブローアによる残留ガス直接排気

(8) 効果判定：(1) 供試虫……コクゾウ

(2) 供試菌……*Aspergillus niger* IAM3001

別紙のとおり

(9) 施行手順

月 日 (曜)	時 刻	作 業 内 容	備 考	
1 日 目	9：00	1. 機器・資材搬入		
		2. シート下敷き		
		3. 厨子搬入		
		4. 養生枠設置		
		5. 供試虫・供試菌配置		
		6. ガス投薬用・濃度測定用各ホース配置		
		7. 気化装置配置		
		8. 爆防型内部ガス均一化装置配置		
		9. 自気温湿度計配置		
		10. シート上掛け		
		11. 上下シート接合		
		12. 内外最終チェック		
	11：30	13. ガス投薬		
		14. 内部ガス均一化装置作動		
		15. ガス漏れチェック及び補修		
		16. 内部濃度測定		
		※ 以後燻蒸終了まで実施		
		(1) ガス安定後、濃度測定は随時		
2 日 目	(2) 濃度低下時、所定量まで追加投薬			
	(3) 巡回警備・ガス漏れチェックは随時			
	11：30	17. ガス排気		
3 日 目		18. 供試虫・供試菌回収及び効果目視確認		
		19. 目張り撤去・現状復帰作業		
		20. 残留ガスの安全基準値 (15ppm) 以下確認		
		21. 関係者立会いによる最終点検		
		10：00		22. 引渡し
23. 機器・資材搬出				
11：00	24. 退出			

註1 三鈷杵 密教法具の一種

註2 羯磨形螺番 密教法具の一種

註3 輪宝形座金具 密教法具の一種

註4 種子 梵字

註5 独鈷杵文 密教法具の一種

註6 瓔珞 宝玉等を用いた仏像や天蓋の装飾



図109 奈良国立博物館蔵品と併列展示
Two shrines on exhibit



図110 空輸のための梱包
Packaging for air transport

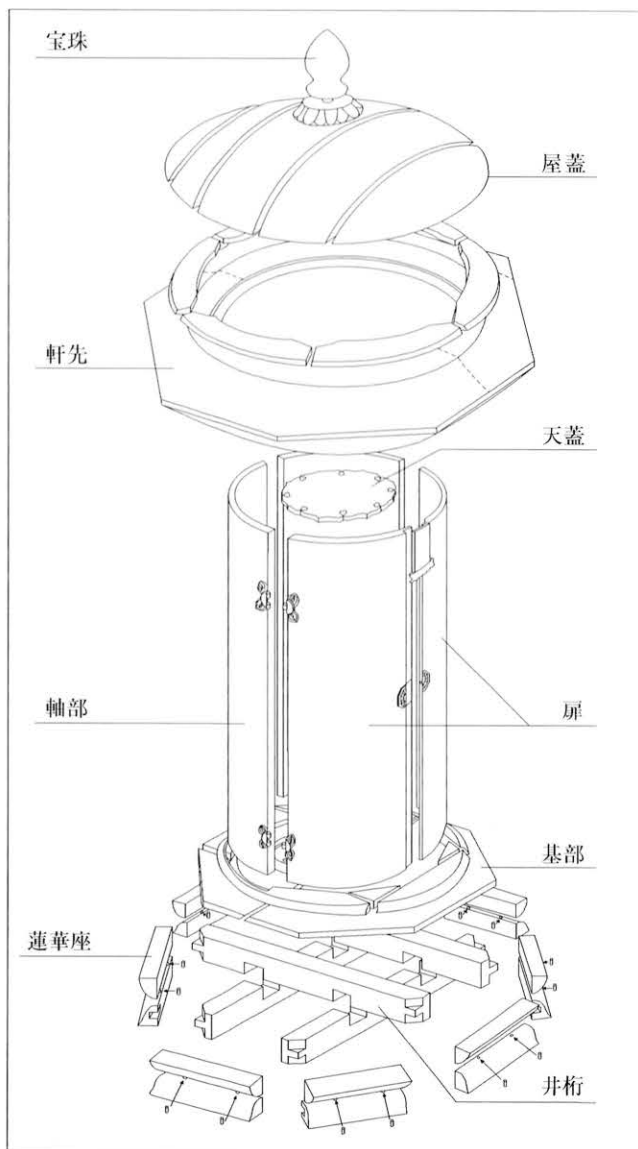


図111 組立構造図 (作図 北村繁)
Structural drawing of the parts of the shrine

On the Restoration of the “*Dai-Hannyakyo Zushi*” in the Collection of
The Cleveland Museum of Art, Ohio, U.S.A.

KITAMURA Shosai, Urushiware Conservator
(Living National Treasure for *Raden* Technique)

This report focuses on a project for the restoration of the black-lacquered “*Dai-Hannyakyo Zushi*” (small shrine to contain the Great-Wisdom Sutra) in the collection of The Cleveland Museum of Art, Ohio. This object is considered to have been made sometime from the late Heian Period to the Kamakura Period. According to a Museum document, it was purchased before January 30, 1969. That is, it went into their collection after the end of World War II through a transaction of purchase from Japan. The *Zushi* (small shrine) is rather big as an object of craft-work, measuring 160cm in height and 98cm in the width of its *kibu* (base)—about the height of a man and more than a man in volume. Its restoration project started in 1997 and was completed in March 2000.

This object is said to have been owned by Shinko-in Temple in Kyoto and used to make a pair with another “*Dai-Hannyakyo Zushi*” of the same shape (now in the collection of the Nara National Museum) that is designated as an Important Cultural Property. It is inferred that the object was originally used to contain a total of 300 volumes of the Great-Wisdom Sutra, piling 100 volumes each in 3 decks. Today, 166 volumes are stored together with the shrine at the Nara National Museum.

Different *kao*, or written seal-marks in Chinese ink, are found on the downsides of the disk of the 16-petal lotus pedestal of the ornamental canopy and of the roof. Together with these marks, a fragment of Chinese characters reading “Kenkyu 10” (10th year of the Kenkyu era, i.e. 1199) was found and is consequently very important for investigating the year of the making of the object.

Description

The object is a wooden, black-lacquered small shrine with a *hoju* (holy jewel) on the top. It consists of 3 main parts: the octagonal *okugai* (roof), the cylindrical *jikubu* (body) with double doors that open on hinges in the front, and the octagonal base. The total height is 160cm, and the width of the base is 98cm.

Hoku (holy jewel):

The holy jewel is attached to the lotus pedestal on the top of the roof and is detachable. A strip of hemp is not used to fix the joints. The surface is plated with gold leaf on *kuro urushi* ground and is finished with *suki urushi*.

Okugai (roof):

The roof consists of a dome placed on top of an octagonal frame that curves up. When viewed from the front, the dome is so set as to show its grains horizontally, while the frame is so set as to show its grains vertically. Eight petals are shallowly carved on the downside of the eaves with *sanko-sho*¹⁾ (Fig. 33) in between. A lotus with 16 compound petals is carved under the eaves. The surface of the substrate is covered with rough hemp cloth, and *kuro urushi* is applied on a thick layer of fine urushi foundation. Gilding is found at several places including the curving tips of the petals at the edge of the eaves.

Jikubu (body):

The cylindrical body, which is joined to the roof, is composed of 4 units of boards that are joined together, with all of their grains in the same vertical direction, after being planed in the form of an arc so that they combine to form a cylinder. Its shape is similar to that of a "sutra tube," a case for containing sutras, that used to be buried in sutra mounds in the Heian Period (794-1185). The lower end of the rear boards are used as tenon and inserted in the base to fix the body. Each of the front 2 boards (doors) is made of 3 pieces of wood that are planed in the form of an arc and joined together. Gilt bronze *katsuma*-shaped metal fittings²⁾ (Fig. 34) are nailed at 4 places (2 in the upper part and 2 in the lower part) of the doors. These fittings are considered to be original ones, but there are some losses on the door side part of the lower right one and on the upper left one. Only nails remain on those broken places.

The surface of the substrate of the body is covered with rough hemp cloth, and *kuro urushi* is applied on a thick layer of urushi foundation. A *rimpo*-shaped gilt bronze ornament³⁾ (Fig. 35) is fitted at the center of the 2 doors so that the two halves of the ornament are properly mated when the doors are closed. A gilt bronze title plate with fine line engravings of Chinese characters (Fig. 36) is attached to one of the doors so that when the doors close it appears at the center of the body.

The inside surface of the body is painted opal ultramarine, and Sanskrit characters (Fig. 37) are written on a lotus pedestal design in a circle on both the right and left sides and halfway up the rear wall. The petals of the lotus pedestal design are vermilion, its inner side opal green, and the background circle is white, while the Sanskrit letters are written in Chinese ink.

Black-lacquered metal fixtures are fitted at 3 different levels at the center of the rear wall. Each of them consists of a 4-flower-shaped metal fitting, a decorative metal fitting through which a string used to be passed. The legs of each fixture were bent on the outer surface of the body and covered with hemp cloth before applying urushi foundation and a coating of *kuro urushi*.

The edges of each door are gilded and there are designs of *dokko-sho*⁴⁾ (Fig.

38) on the door. The background is opal ultramarine. Four god figures each are painted on the 2 doors with black, green, blue, ultramarine, opal green, opal ultramarine, vermilion and vivid yellowish red pigments as well as very fine gold and silver (Figs. 39 & 40).

The body is covered with a flower-shaped ornamental canopy which is made in the shape of an 8-petal lotus flower with *hosoge* (peony-like floral design) and lotus flower designs (Fig. 41) and is decorated with vermilion, green-blue and ultramarine pigments as well as gold foil and very fine cut pieces of gold and silver. The ornamental canopy is attached to the roof with bolts so that it can be removed. A metal rim with an arabesque design of gilt bronze openwork is wrapped around the upper edge of the body, and pieces of gilt bronze ornament with openwork and lapis lazuli are suspended from the rim.

Kibu (base):

The inner structure of the base consists of 4 square wooden bars that are built in *igeta*, or parallel crosses composed of 2 parallel bars laid crosswise on another set of 2 parallel bars. The top board is made of 3 boards joined together. The *igeta* is surrounded by a double lotus pedestal with 8 petals that curve upward and 8 that curve downward. Another 16-petal lotus pedestal is placed on top of the first one. This is attached to the *igeta* inside the body, which is made of 3 square bars, by wooden pegs placed into 4 holes on the lotus disk.

Just as on the other parts, the outside surface is covered with hemp cloth, and urushi foundation is applied before the final coating of *kuro urushi*.

Damage to the Shrine

Holy jewel: Holes made by insects were found all over the surface of the lotus pedestal (Fig. 42). The urushi coating was damaged and lost at several places by cracks along the grain, breakage, or hollows in the substrate.

Roof: The urushi coating had come off due to cracks along the joints of the boards, which in turn had caused considerable openings between the boards (Fig. 43). In addition, two of the pegs that had been used to join the boards did not actually serve their function.

Ornamental canopy: There were cracks along the joints of the substrate (Fig. 44), and parts of the floral pattern were damaged and lost. Since there are some rusted nails on the roof (Fig. 45), it is believed that originally iron clamps had been nailed into several places and that strings were attached to these clamps to suspend the canopy from the roof. Now there is a metal bolt on the rear side of the ornamental canopy (Fig. 44).

Body: The main part had remained in a good condition, but there were small cracks in the urushi coating of the doors at a right angle to the grains of the substrates and in the boards of the doors along their grains. There were some broken and

lost places that had been later simply patched with no coating applied. The colored surface inside had remained in a stable condition on the whole, but there were some places where cracks in the urushi coating underneath had extended into the colored surfaces. The ring of the left metal fitting had been lost. A part of the disk of the 16-petal lotus pedestal inside the body had been retouched and its color had changed. There were also several places that had been damaged by insects (Fig. 46).

Base: There were cracks in the substrate along the joints of the floor and also along the joints of the 8 boards of each of the lower 2 lotus pedestals. As a result, the urushi coating had fallen greatly at those places. In addition, there were several places that had been lost due to damage by insects and had been later restored with replacement lotus petals. Parts of the lotus pedestals were not in horizontal alignment, and when the object was displayed in the "Masterpieces from the Collection of the Nara National Museum" exhibition in April 1997, the tips of some of their petals that had been split were bonded with *mugi urushi* as an emergency measure and their openings were filled with *kokuso* (Fig. 47).

A thin plywood board had been attached to the bottom and fixed with wooden screws. When this board was removed, it was found that all of the *igeta* wood members and the 8 boards of the peripheral lotus pedestals had been damaged by insects to such an extent that they were almost hollowed out and consequently could not support the entire weight of the object. For this reason, they were reinforced with iron angle bars (Fig. 48) and several iron nails as an emergency measure. In addition, there were some insect-damaged places where black resin seemed to have been impregnated for repair. But The Cleveland Museum does not have any record of such repairs.

Restoration Plan and Method

After due consultation with Dr. Cunningham, curator in the Department of Japan and Korea, and Mr. Chrisman in charge of conservation, both of The Cleveland Museum of Art, the conservator made yearly restoration plans for a total of 3 years of work under the direction of Mr. Kato Hiroshi, chief of Wood/Urushi Section, Department of Restoration Techniques, Tokyo National Research Institute of Cultural Properties.

[General Restoration Plan]

1. It was decided that repair would be carried out pursuant to the principles of maintaining the existing state of the object applicable to cultural properties designated by the Agency for Cultural Affairs of Japan and that the object would be structurally reinforced to withstand possible physical shocks during air transport back to the Museum and to protect it against less humid climate

in Cleveland, although temperature and humidity are properly controlled in the Museum for its collection. For this purpose, the object was to be disassembled to provide ample reinforcement to those parts that would be found structurally weak.

When the shrine was laid down on its side at the time of disassembly and the plywood board was removed from the base (Fig. 49), it was found that the *igeta* part had deteriorated, as mentioned earlier, due to humidity and damage by insects over a long period of years to such an extent that it could no longer support the entire weight of the object. Consequently, it was decided that the *igeta* wood members would be replaced with new ones and that the old members would be returned to the Museum to be preserved separately. The frame that makes up the peripheral lotus pedestals of the base were considerably damaged by insects and partially hollowed out. They, therefore, were to be reinforced in a proper way while retaining their original external shape.

2. The missing tips of some of the petals of the lotus pedestals and the ornamental canopy would not be restored to the original shapes. The paintings and coloring on the doors and inside surface of the body were stable and, in principle, would not be repaired except those places where urushi coating was found to be in danger of peeling off due to loss or cracking. Appropriate measures would be taken to prevent the urushi coating from being lost or peeled off at those places.
3. The lost portions of the metal fitting would not be restored to the original.
4. Studies would be made to find any appropriate method of attaching the ornamental canopy instead of using the metal bolt and nut (Fig. 50).
5. The holy jewel, which was detachable, would be kept as it was, for the convenience of transport. (The holy jewel on the shrine in the collection of the Nara National Museum is fixed to the roof.)
6. There was fear that tips of some of the petals of the lotus pedestal in the base might become broken and lost at the time of transport. In fact, there were several tips that had already been lost. For this reason, it was decided to make a new protective stand.
7. It seemed that the object had already been chemically treated to kill insects (dead bodies of insects were found), but insecticidal treatment would be conducted anew by using Ekibon gas at the time of return, just to be sure.
8. If problems were to arise in the process of restoration, the people concerned would discuss them and make decisions as to what to do with them.
9. The restoration work would be recorded by photographs, videos and drawings.

[Restoration Plan for 1997]

1. When the Nara National Museum held the exhibition "Masterpieces from the Collection the Nara National Museum" in 1997, the object was borrowed from

The Cleveland Museum of Art. After the exhibition, it was carried to the repair room in the basement of the new building of the Nara National Museum to conduct restoration work there. The repair room was lent free of charge for the entire period of restoration work thanks to the full cooperation of the Nara National Museum.

2. The transport of the object and the making of a workbench on which the object would be laid for examination and restoration work was to be undertaken by Nippon Express Co., Ltd.
3. Damage to the object and its materials, construction and shape would be recorded with photographs and drawings.
4. A chamber for hardening urushi would be made.
5. Restoration materials would be purchased.

[Restoration Plan for 1998]

1. Drawings showing the condition of damage to the object would be made.
2. Photographs would be taken of the details of the damaged parts.
3. Urushi coating on the roof would be protected from peeling off.
4. Damaged parts of the urushi coating on the roof would be removed and then temporarily returned to their original places as shown in the recorded drawings.
5. The roof and the base would be disassembled, and their construction drawings would be made.
6. Damage made by insects and other missing parts would be filled with *kokuso* for reinforcement.
7. Greatly lost parts of the substrate would be restored to the original by using Japanese cypress.
8. Disassembled parts of the substrate would be re-assembled as before by using *mugi urushi*, wooden pegs, etc.
9. The substrate would be repaired with *kokuso* and urushi foundation.
10. The old *igeta* frame damaged by insects would be replaced by a new one made of Japanese cypress bars.
11. Peeled-off parts of the urushi coating of the roof would be fixed to their original positions with *mugi urushi*.
12. Cracks in the urushi coating would be treated with *kokuso* and urushi foundation.
13. Cross-sectional drawings of fragments of the urushi coatings on the roof and the base (cross sections of the coating, Figs. 51-1 & 52-1) would be made and their coating processes would be examined by microphotography.

[Restoration Plan for 1999]

1. Urushi foundation of the repaired places would be polished.

2. Urushi would be applied on the repaired places.
3. A new protective stand would be made and coated with urushi.
4. Photographs of the object after restoration would be taken.
5. A record of the restoration work would be made.
6. The object would be treated chemically to kill insects.
7. The object would be returned.

Restoration plans were worked out as above, and any problem that arose as the restoration work progressed was solved one by one.

Processes of the Restoration Work and Photographs

[Overall Process]

1. Transport of the object from the exhibition room to the restoration studio of the Nara National Museum by Nippon Express Co., Ltd. in the presence of Dr. Cunningham of The Cleveland Museum of Art and Mr. Kajitani of the Nara National Museum (Fig. 53)
2. Condition of damage by insects on the lotus pedestal below the holy jewel (Fig. 42)
3. Damage to the substrate and urushi coating of the roof (Fig. 54)
4. Condition of the colored parts on the inside surface of the body—stains on the color of the Sanskrit letters probably due to rainwater from above (Fig. 37)
5. Damage to the colored portion and metal fittings of the doors (Fig. 55.1)
6. Stains and changes in the color of the ornamental canopy and damage to its substrate (Fig. 41)
7. Metal bolt and nut to attach the ornamental canopy (Fig. 50)
Various ways of attaching the ornamental canopy were examined, and the current way was found best because of its ease of attachment and stability. As a result, it was decided to apply a new urushi coating to the bolt and nut in such a way that they would match the surrounding.
8. Workbench for laying down the object on its side and equipment for hardening urushi (Fig. 57)
9. Condition of the base as seen from its underside before restoration (Fig. 49)
10. Condition of the underside of the base after removal of the plywood board covering it (Fig. 7)
11. Relationship between the body and the base (Fig. 58)
12. 16-petal lotus pedestal disk in the body and its condition (Fig. 59-1)
13. Ornamental canopy and its condition—both outside and inside (Fig. 60)
14. Structure of the roof and its condition (Figs. 67, 93 & 111)
15. Condition of damage to the roof (Fig. 61)
16. Condition of the holy jewel (Fig. 62)

[Disassembly of the Roof and Photographs]

1. Protecting the urushi coating before disassembly (Fig. 63)
2. Drawing showing the current condition of the roof before disassembly (Fig. 64)
3. Disassembling the roof and removing the urushi coating (Fig. 65)
4. Underside of the disassembled roof (Fig. 66)
5. Urushi coating temporarily positioned to the places designated in the drawing of the current condition of the roof (Fig. 67)
6. Condition of the substrate after the removal of the urushi coating (Fig. 68)
7. Substrate that became hollowed and small wooden pieces that were filled in the openings (Fig. 69)
8. Disassembled roof

It was originally believed that each section of the roof was composed of 2 boards: the upper and lower boards. But 6 pieces of wooden joint boards were found between the upper and lower boards. The joints had become separated due to the shrinkage of the substrate and the deterioration of the nails, which then resulted in great damage to the urushi coating

9. Deteriorated iron nails and clamps (Fig. 70)
10. Roof frame showing chisel marks and 6 pieces of wooden joint boards (Figs. 71)

[Disassembly of the Base and Photographs]

1. Urushi coating of the base before disassembly (Fig. 72)
2. Framework of the disassembled lotus pedestal (Fig. 73)
3. Framework of the lotus pedestal damaged by insects (Fig. 74)
4. Disassembled framework of the lotus pedestal and floor of the base; structural drawing of the *igeta* and framework (Figs. 75-1 & 76-1)

[Reassembly and Restoration of the Base and Photographs]

1. A slender Japanese cypress bar was inserted into each hole made by insects on the framework of the lotus pedestals and then the gap was filled with *kokuso* so that it would be restored with sufficient durability (Fig. 76). (This idea is similar to that of the structure of reinforced concrete.) This work was recorded on video film (Fig. 77).
2. Largely missing parts were restored by using new Japanese cypress wood, wooden pegs and *mugi urushi* (Figs. 78 & 79).
3. There was a large opening between the body and the top board of the base, which was consequently a source of instability. To support and reinforce this, therefore, brass screws were driven from the sides of the body (Fig. 80), and the openings were filled with wooden pieces and *kokuso* (Figs. 81 & 82).
4. Reassembling of the base and the lotus pedestal (Fig. 83)

5. Filling the missing portions of the base with *kokuso* (Fig. 84)
6. A new clamp that was driven into the joined parts of the framework of the curving-up petals of the upper lotus pedestal of the base (Fig. 85); a table of components of the clamps (the same materials as in those clamps used for reconstructing the Golden Pavilion of Yakushiji Temple, Nara Pref.) (Fig. 86).
7. Old *igeta* with insect damage that was removed and a new replacement made of Japanese cypress (Fig. 88). Mortises were made on the new *igeta* members as on the old ones (Fig. 87).
8. Joining the curving-down petals of the lower lotus pedestal (Figs. 89 & 90)
9. Driving new clamps into the downside of the framework of the lower lotus pedestal
10. Building the *igeta* frame (Figs. 91 & 92)

[Reassembly and Restoration of the Roof, Restoration of the Doors, Finishing Work on the Entire Object and Photographs]

1. The disassembled roof was reassembled as before with *mugi urushi*, wooden nails and brass screws (Fig. 93). After the *mugi urushi* had hardened, the wooden nails were pulled out and *mugi urushi* was filled into the holes; wooden pegs made of deutzia were driven in (Fig. 94).
2. Pieces of peeled-off urushi coating were re-fixed to the original positions with *mugi urushi* (Fig. 95).
3. Urushi foundation was applied to the openings between the coating film (Fig. 96).
4. Roof with urushi foundation applied
5. Applying urushi to the repaired places on the roof (Fig. 97)
6. The restored roof (Fig. 98)
7. Restored part of the roof (Fig. 99)
8. Cracks on the urushi coating of the doors (Fig. 100)
9. Large cracks were filled with *kokuso*, and then after urushi foundation was applied, those places were coated with urushi. Raw urushi was impregnated into the small cracks for reinforcement (Fig. 101).
10. Restored doors (Fig. 102)
11. The damaged urushi coating around the legs of the metal fittings on the inside of the doors were filled with *kokuso* and reinforced.
12. To soften the black tone of *kokuso*, its surface was polished with an air turbine (Fig. 103).
13. To protect the tips of the petals of the lotus pedestal of the base, the object was placed on a wooden stand made of Japanese cypress wood on which *suki urushi* was applied.
14. Condition of the restored lotus pedestal of the base and its stand

It was so restored that the entire weight of the object would be supported by the new *igeta* frame. For this reason, the lotus pedestal is lifted a little from the stand to reduce the load of the shrine during air transport (Fig. 104). This wooden stand is attached to the *igeta* by 2 brass screws and is detachable.

15. Upside of the restored base (Fig. 105-1)
16. Front, back and parts of the restored 16-petal lotus pedestal disk in the body (Fig. 59-2)
17. Front, back and parts of the restored ornamental canopy
The metal bolt and nut are coated with urushi (Fig. 106).
18. Entire view of the restored shrine (Fig. 2)
19. Killing insects by Ekibon gas after restoration (Fig. 107)

The restoration of the shrine was confirmed by Mr. Chrisman of The Cleveland Museum of Art, Mr. Naito Sakae and Mr. Ito Tetsuo of the Nara National Museum and Mr. Kato Hiroshi (Fig. 108). It was exhibited with the shrine of the same configuration in the collection of the Nara National Museum from April 29 to May 21, 2001 at the Museum (Fig. 109). After the exhibition, it was immediately packed and air transported by Nippon Express Co., Ltd. (Fig. 110).

Reference Data

1. Microphotographs of the cross section of the urushi film
The cross section of the film on the roof shows that there are 3 layers of coating, which means that the object was probably re-coated twice on its entire surface. It was also found that verdigris is mixed in the lower layer of the second coating (Figs. 51-1 & 52-2).
2. Structural drawing of the shrine as found by disassembling (Fig. 111)
Cross section
Restored parts
Plan of the roof
3. Restoration staff
Making of the substrate: Sakamoto Kyokusai
Assistant lacquerers: Chujo Iori, Kitamura Shigeru and Konishi Yasuko
Fumigation: Inoue Shunzo
Photography: Goto Chikao
Cross-section photographs: Okada Fumio

Notes:

1. A ritual object in the shape of a bar with 3 prongs on each end and used in esoteric Buddhism
2. A ritual object used in esoteric Buddhism. *Katsuma* is 2 *sanko-sho* joined in a cross
3. A ritual object used in esoteric Buddhism
4. A ritual object in the shape of a bar with 1 prong at each end and used in esoteric Buddhism

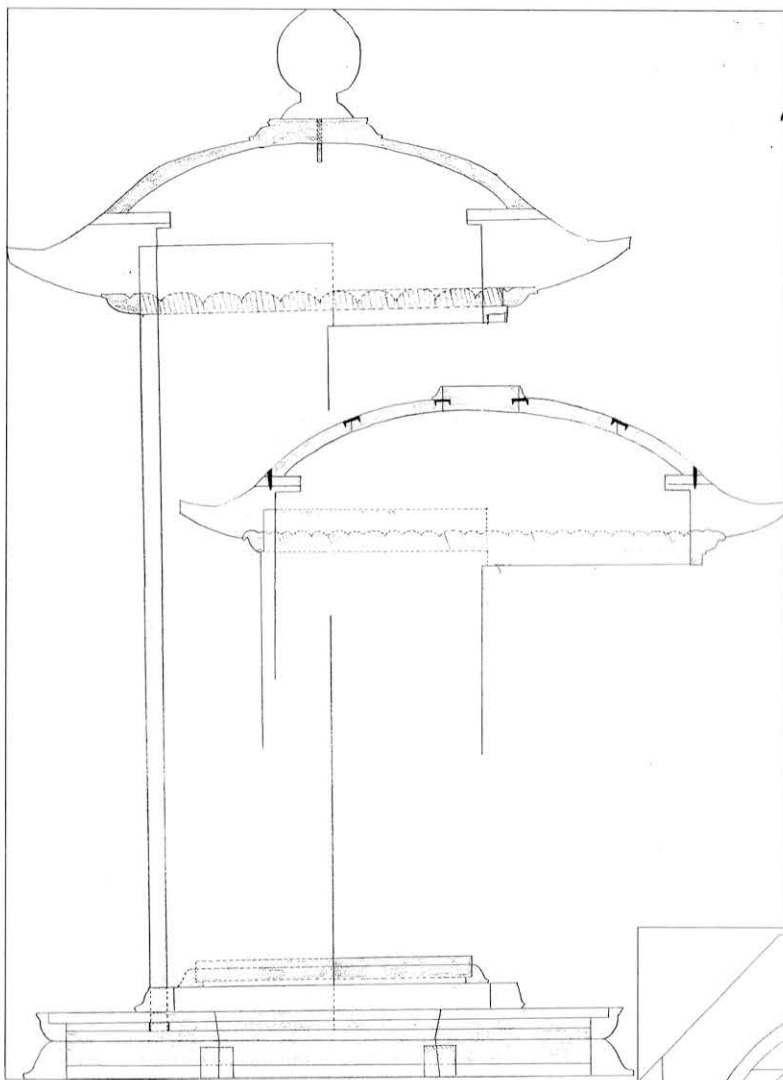


図112 構造断面図と修復平面図
Standing section of the shrine before and after
restoration

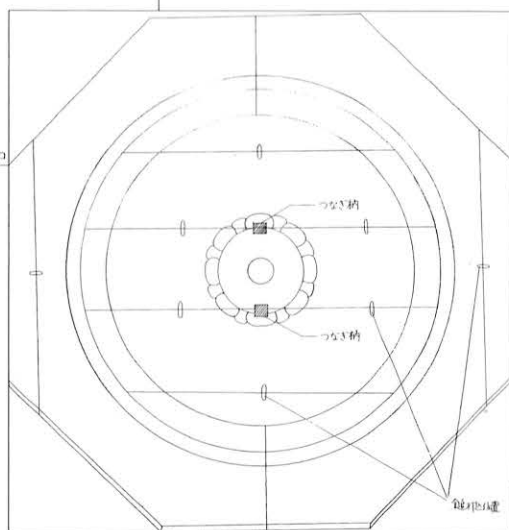


図113 屋蓋平面図
Plan of the roof