

PATAN MUSEUM - THRONE OF THE PATAN KINGS

Report of the Institute of Conservation (IoC), University of Applied Arts Vienna



Fig. 1: Overview of the Throne of the Patan Kings, 2017

Data Sheet

Description

For more than a hundred years this was the royal throne of the kings of Patan. They were considered to be incarnations of Hindu god Vishnu. The throne accordingly conveys this connection. With the front panel showing Garuda, a bird-like creature and vehicle mount of Vishnu, it creates the illusion of the enthroned king as Vishnu seated on Garuda. The backrest depicts a multi-headed divine serpent. An inscription above Garuda tells the origin and story of the throne. Dated 1666, the almost two metres high throne consists of several elements mainly made of fire-gilded repoussé and is a testimony to Patan's highly skilled metal craftsmanship. Today it is one of the Patan Museum collection's masterpieces.

As the object was not just covered with dust, dirt and corrosion products, but also lacked stability, conservation work on the throne had been carried out in 2017 by a team of the Institute of Conservation in cooperation with the museum staff and local craftsmen. Condition surveys and natural scientific investigations preceded the conservation work.

The throne is not only a museum exhibit but also an integral part of an annual festival celebrated in Patan. During this time, it is displayed at Krishna Mandir on Patan Durbar Square.

Names

Dated	1666												
Measurements (H x W x D)	185 x 136 x 110 cm												
Materials/Technology	Wood, iron, upholstery, textile, fire gilded copper												
Interventions (IoC)	<table> <tr> <td>Survey</td> <td>2017-2018</td> </tr> <tr> <td>Mapping</td> <td>2017-2018</td> </tr> <tr> <td>Sampling</td> <td>2017</td> </tr> <tr> <td>Analyses</td> <td>2017</td> </tr> <tr> <td>Conservation</td> <td>2017</td> </tr> <tr> <td>Maintenance</td> <td></td> </tr> </table>	Survey	2017-2018	Mapping	2017-2018	Sampling	2017	Analyses	2017	Conservation	2017	Maintenance	
Survey	2017-2018												
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Conservation	2017												
Maintenance													
Team (IoC)	Gabriela Krist, Manfred Trummer, Marija Milchin, Martina Haselberger, Kathrin Schmidt												
Academic Research (IoC)	Pre-Thesis Magdalena Tremel 2018												

Survey: Materials and Technology

Wooden construction:

- Core of the backrest consists of three parts, with joined with square pegs → mounted on a wooden horizontal beam by a plug-in system and pegs; iron loop in the middle of the back side; top part has nine extensions (hollow serpent heads)
- Core of the front panel made out of seven parts, similar constructed as the core of the backrest
- Plinth made out of seven parts, similar to the former constructions; rectangular recesses probably serving former mountings
- Pegs for keeping the backrest in place, wooden frame of the upholstery is mounted on top of the sub-construction by using pegs
- Upholstery core is composed of a wooden frame with a cover and two wooden cylinders underneath the armrests

Iron:

- Not clearly if there are original iron parts, probably all secondary introduced.
- Supporting structure on the branches made out of iron;
- Iron rods lead through the internal space of the stems
- Smaller branches with hole in the end of the iron rod
- Taller branches fixing are not completely clear
- Copper sheets of the flag are wrapped around iron rods (mounted in holes on the lower wooden beam of the backrest)
- Lower end of the rods pieces of thick iron wires are sweated, keeping the flagpoles in position
- Iron construction connects animals with the wooden plinth
- Rectangular copper sheet strap screwed on each of the bottom sided of the elephants with steel screws
- On the middle part of the sheet an iron rod with a tread is soldered with brass solder (through wooden plinth and fixed screw and shim on the bottom side)

Upholstery and textile:

- Wooden support with padding of foamed material, older textiles in different shades of red.
- Textile folded on the edges and fixed by steel nails on the bottom side,
- Two cylindrical armrests with sewed velvet covers with a seam on one side and a draw cord on both circular sides, which is tightened with drawstrings
- Textile on the bottom wooden beam of the backrest (front and upper side is wrapped), fixed with an overall applied glue and with additional nails on the back and bottom side.

Fire gilded copper elements:

- Fire gilded copper with added fine lines in repoussé work
- Ornamental and formative elements are assembled through the joining of copper sheets (formed as half relief, flat, or fully plastically)
- Connections between metal sheets: fully plastically firmly hammered together, soldered, or using rivets
- Original gilded rivets rare and found on the upper part of the backrest and the necklace of the very left elephant.
- Secondary copper split pins on the animals and banner's top of the flagpoles, partly in combination with copper shim

- Lions mounted onto elephants with metal rods (each leg through the backs and the heads of elephants) fixed with brass wire loops tucked through holes on the ends of the rods.
- Taller branches are later additions or made from another workshop
- knob discs non gilded repoussé and copper stick soldered on the back side (later additions); stick is tucked in a hole of the wooden core of armrest



Fig. 2 and Fig. 3: Visible construction (gilded metal on wooden support), 2016



Fig. 4: Wooden construction, 2016



Fig. 5: Original rivet (neck of left elephant - left group), 2016

Previous (Conservation) Intervention

Unknown	later added linkage system;
Unknown	later added bare copper rivets;
1989	conservation done by Leonhard Stramitz (cleaning with water, fixing missing or broken parts; introducing a sub-construction of the seat, fixed with screws);
1989	Museum upset: Two cylindrical armrests and the wooden sub-construction are probably an additions of the museum set up;
After 2007	Introducing red velvet synthetic fibres;

Survey: Condition and Causes of Decay (2017)

- Soiling (dust and loose dirt particles, also rice, in cavities)
- Corrosion on the surface of iron rods, linkage system
- Broken iron rods;
- Scratches on wooden elements and few wall paint remnants on the backrest;
- Fire-gilded copper parts incrustated with dirt;
- Remnants of worshipping (paints and greasy residues);
- Sub-corroded gildings;
- Abrasion and loss of gold (scratches due to handling and fading of gold due to touching);
- Deformation (due to handling and mechanical pressure);
- Cracks on edges;
- Lost parts (as: leaves, snakes tongue, tail of left lion, left ear and a part of the necklace of the elephant on the very right, and the antler of the left dragon);
- Rivets or nails in the front panel are missing leading to loose parts;



Fig. 6: Cracks and dust deposits, 2016



Fig. 7: Deformation, holes and cracks, 2016



Fig. 8: Heavily soiled surface, 2016



Fig. 9: Corroded and soiled surface, 2016



Fig. 10: Abrasion on the banner's top (left flag), 2016

Conservation (IoC)

- Dismantling / disassembling;
- Dry cleaning of loose dust and dirt layers with non-metallic brushes;
- Metal surfaces cleaned in combination of mechanical and wet cleaning (by using scalpel and different knives; 5-10 % citric acid 15-25 minutes also in combination of poultices);
- Corrosion of iron parts was mechanically reduced with scalpels or rotating iron brush;
- Consolidation of cracks with epoxy resin (Araldite ©2020);
- Introducing new round headed brass nails;
- Reinforcement as structural repair with glass fibre mat fixed with Paraloid © B72;
- Protective coating with microcrystalline wax Tecero ©30410;
- Sweating iron rod using an electrode welding apparatus;
- Retouching of newly introduced parts with pigments and Paraloid © B72;
- Partially glued textiles with acrylic resin Plextol ©B500;
- Introducing a new textile;

Conservation Materials used*:

Plextol B500, Tecero ©30410, Paraloid © B72, Araldite ©2020 (Akemi)

* All product / technical data sheets can be found at the additional file [A]

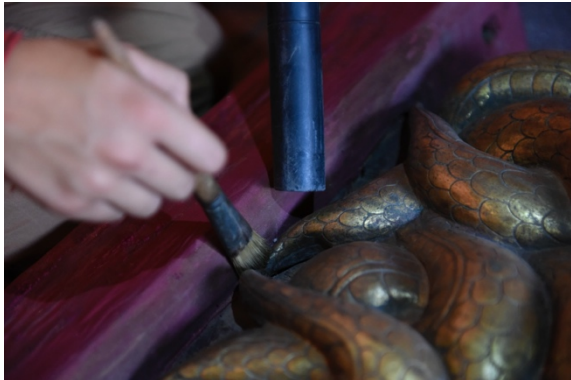


Fig. 11: Dry cleaning with brushes and vacuum cleaner, 2016



Fig. 12: Applying a new textile, 2016



Fig. 13: Wet cleaning with citric acid poultices, 2016

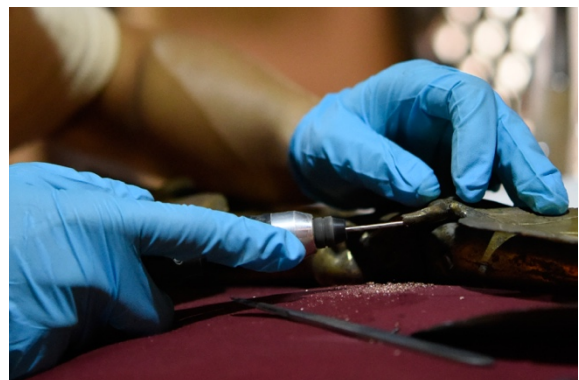


Fig. 14: Drilling holes for fixing the support, 2016

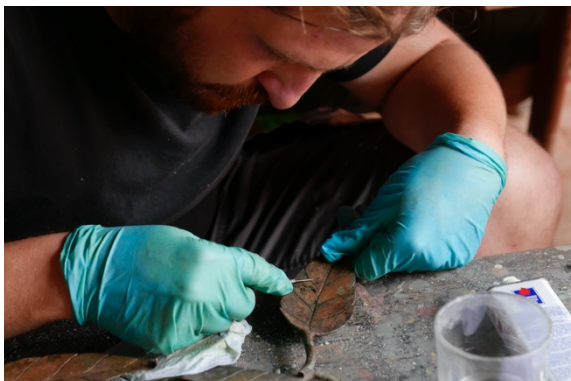


Fig. 15: Mechanical cleaning with scalpel, 2016

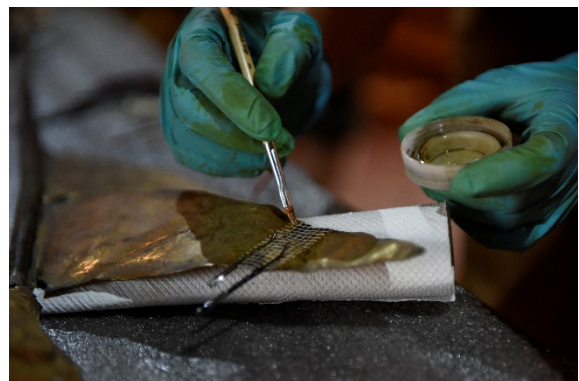


Fig. 16: Gluing of parts, 2016



Fig. 17: Removal of gluing residues with acetone, 2016

Before and after Conservation



Fig. 18: Overview before conservation, 2016



Fig. 19: Overview after conservation, 2017

List of Publications / Reports (IoC)

Treml, M., The Throne of the Patan Kings in the Patan Museum, unpublished Pre-Thesis, Institute of Conservation, University of Applied Arts Vienna, 2018.

GENERAL INFORMATION

Object / Monument Golden Throne	Orientation -	Size (H x L x W) -
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Date of Production 1666	Location Patan Museum, Keshav Narayan Chowk
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Material and Technology

- Copper repoussé and bronze cast elements, fire gilded
- Wooden support
- Iron rods as support structure on the branches
- Textile upholstery (secondary)

Date of the last Treatment Conservation 2017: see pre-diploma theses (Tremblay 2018)	Institutions of the last Treatment IoC
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EVALUATION

Date of Evaluation May 2024	Evaluation done by Meral Hietz, Katharina Mendl
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All descriptions from viewers perspective

Recent Damages:

<input checked="" type="checkbox"/> Stability Problems <table border="0" style="display: inline-table; vertical-align: top; margin-left: 20px;"> <tr> <td><input type="checkbox"/> Major</td> <td>- Heads of left elephant (left lion) and left elephant (right lion) wobbling</td> </tr> <tr> <td><input type="checkbox"/> Medium</td> <td>- Head of right dragon wobbling (due to a large crack)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Minor</td> <td></td> </tr> </table>	<input type="checkbox"/> Major	- Heads of left elephant (left lion) and left elephant (right lion) wobbling	<input type="checkbox"/> Medium	- Head of right dragon wobbling (due to a large crack)	<input checked="" type="checkbox"/> Minor	
<input type="checkbox"/> Major	- Heads of left elephant (left lion) and left elephant (right lion) wobbling					
<input type="checkbox"/> Medium	- Head of right dragon wobbling (due to a large crack)					
<input checked="" type="checkbox"/> Minor						

Comment:

- | | |
|---|-------------------------------|
| <input type="checkbox"/> Broken / - into several Pieces | <input type="checkbox"/> Many |
| | <input type="checkbox"/> Some |
| | <input type="checkbox"/> Few |

Comment:

Lose / Missing Parts

- Many
 Some
 Few

- Wooden base bumped at the corners, missing parts in the area of the elephants' hind legs
- Bronze rosette on the right upholstery loose
- Tail of left lion missing
- 1 leaf tip of the left front branch broken off and missing
- 7 leaves on the left front branch missing
- 4 to 5 branches and a total of 6 leaves of the left hind branch missing
- 11 leaves on the right-hand branches missing
- 2 leaves and two leaf tips on the right front branch missing
- 1 branch with leaves on the right hind branch missing
- Leaves from the tongues of nine nagas missing
- Tip of the right-hand flagpole missing
- Bottom part of left mirror missing
- 2 leaf ornaments on the body of the right dragon missing (9 mounting holes visible, nails missing)
- The half mane of the right dragon missing
- Leaf element applied on the body of the left dragon loose

Comment:

Cracks / Holes

- Many
 Some
 Few

- 1 crack in the left upper flag
- 2 cracks in the copper sheet of the right dragon
- 1 crack each in the right front and hind branch
- 1 crack in the tusk of each of the two elephants (right lion)
- 1 hole and 4 cracks in the mane of the right lion
- 5 cracks in the mane of the left lion
- 1 hole in the head of the left dragon
- Some cracks in the edge area of the nagas
- 8 small cracks in the front panel (Garuda)

Comment:

<input checked="" type="checkbox"/> Deformation / Dents	<input type="checkbox"/> Major <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Minor	<ul style="list-style-type: none"> - Indentation in the chest of the right lion - 5 tips of the leaves on the right front branch deformed - 2 branches on the right hind branch deformed - 6 branches on the left front branch deformed - 2 branches on the left hind branch deformed - Tail of the right lion deformed - Left hind leg of the left lion deformed
Comment:		
<input checked="" type="checkbox"/> Abrasion / Worn out Gilding	<input type="checkbox"/> Major <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Minor	<ul style="list-style-type: none"> - Slightly darkening in the lower area of the nagas, worn out gilding in the edge area - General darkening in areas of thin gold layer or areas with no gold (especially flags of pole flags and mirrors as well as topsides of elephants, lions and dragons) - Partial darkening on branches and leaves - Partial darkening on the front panel (Garuda), especially inscription - Worn out areas on heads, trunks, backs and legs of elephants and lions (especially on the upper sides) - Abrasion of the gilding on the heights of the lion's manes and on the front panel
Comment:		
<input checked="" type="checkbox"/> Corrosion	<input type="checkbox"/> Major <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Minor	<ul style="list-style-type: none"> - Darkening see worn out gilding - Green corrosion on the head and body of the right dragon, partly on the back of the right and left lion, left hind leg of the right elephant (right lion), back of the left and right elephant (left lion), upper side of Garuda (especially on the left wing); on a leaf at the left front branch, left hind branch below, lower area of the nagas, on lower right banner of the right pole flag
Comment:		
<input checked="" type="checkbox"/> Soiling	<input checked="" type="checkbox"/> Dust	<input type="checkbox"/> Heavy <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Light
	<input checked="" type="checkbox"/> Dirt	<input type="checkbox"/> Heavy

Medium

Light

Blood

Heavy

Medium

Light

Comment:

Evaluation of the Condition

good

satisfactory

unsatisfactory

Conclusion

In general, the condition of the object was judged to be good. Most of the mechanical damage described (broken or loose elements, missing parts, cracks, holes, deformations and dents) was present prior to conservation in 2017. Both the epoxy resin (Araldite 2020) and carbon fibre securing measures and the fibreglass and Paraloid B72 securing measures were assessed as stable in May 2024. However, the visual appearance is unsatisfactory (particularly the fibreglass reinforcement of the top flag on the right-hand flagpole).

The surface treatments also proved to be stable in the long term. The throne shows partial darkening in areas where the gilding has worn out. There are also some (presumably new) green corrosion products on the surface that need to be removed.

Due to the annual use of the object, it is particularly important to stabilize the wobbling or loose elements of the throne to prevent them from breaking off. After use, the object should be cleaned to remove the ritual substances from the metal surface, as these can accelerate corrosion. In addition, the object should continue to be dry-cleaned by museum staff at regular intervals to remove dust deposits from the surface.

PHOTO DOCUMENTATION



Fig. 1: Golden Throne after conservation and reassembling, 2017



Fig. 2: Golden Throne in May 2024



Fig. 3: Cracks in the copper sheet of the right dragon



Fig. 4: Red substance in the mouth of the left dragon



Fig. 5: Green corrosion on the back and hind leg of the right lion



Fig. 6: Green corrosion on left hind leg of the right elephant (right lion)

[A] Product Data Sheets – Links¹ to Suppliers/Manufacturers

AEROSIL® 200

https://products.evonik.com/assets/or/ld/AEROSIL_200_TDS_DE_DE_TDS_PV_52043839_de_DE_WORLD.pdf

Aviva Silikat Grundierung

https://www.adler-lacke.com/Canto/tmb/aviva-silikat-grundierung_tmb_4079_de.pdf

Alkylbenzyltrimethylammonium chloride

<https://www.sigmaaldrich.com/AT/en/sds/mm/8.14858?userType=anonymous>

KluceI™ EF

<https://www.kremer-pigmente.com/elements/resources/products/files/63701-63713.pdf>

Aviva Tirokat-Color, Adler

https://www.adler-lacke.com/Canto/tmb/aviva-tirokat-color_tmb_4087_de.pdf

Mixtion Le Franc, Kremer

<https://shop.kremerpigments.com/elements/resources/products/files/98000e.pdf>

Waxes, Deffner und Johann

https://deffner-johann.de/media/datasheets/4186000/EN/Zusatzinformation_Wachse_DE_DJ.PDF

Injection mortar HFX

https://productdata.hilti.com/APQ_HC_RAW/ASSET_DOC_7567931.pdf

Köln Classic Ölmixtion 3h; 12h; 24h

<https://www.kolner-vergolderprodukte.de/produkte/koelner-oelmixtion/>

KSE 500 E

https://media.remmers.com/celum/export/documents/Remmers_0715_KSE-500-E-_Technisches-Merkblatt_de_DE_26355.pdf

Lascaux 498 20 X acrylic adhesive

[https://deffner-](https://deffner-johann.de/media/datasheets/2051100/DE/2051100_Technisches%20Datenblatt_Lascaux%20Acrylkleber%20498%2020%20X_DE_DJ.pdf)

[johann.de/media/datasheets/2051100/DE/2051100_Technisches%20Datenblatt_Lascaux%20Acrylkleber%20498%2020%20X_DE_DJ.pdf](https://deffner-johann.de/media/datasheets/2051100/DE/2051100_Technisches%20Datenblatt_Lascaux%20Acrylkleber%20498%2020%20X_DE_DJ.pdf)

Marble dust

https://www.kremer-pigmente.com/elements/resources/products/files/58500-58580_59001-59690.pdf

Natural hydraulic lime

<https://www.preservationworks.us/wp-content/uploads/2019/10/NHL-Datasheet-Lafarge-23.5.pdf>

Plextol B-500 (acrylic dispersion)

[https://deffner-](https://deffner-johann.de/media/datasheets/2556500/DE/2556500_Technical%20Data%20Sheet_Acrylic%20Dispersion%20B%20500_EN_DJ.pdf)

[johann.de/media/datasheets/2556500/DE/2556500_Technical%20Data%20Sheet_Acrylic%20Dispersion%20B%20500_EN_DJ.pdf](https://deffner-johann.de/media/datasheets/2556500/DE/2556500_Technical%20Data%20Sheet_Acrylic%20Dispersion%20B%20500_EN_DJ.pdf)

Primal® SF 016

[https://deffner-](https://deffner-johann.de/media/datasheets/2543001/DE/2543001_Technical_Data_Sheet_Primal_SF_016_DJ_EN.pdf)

[johann.de/media/datasheets/2543001/DE/2543001_Technical_Data_Sheet_Primal_SF_016_DJ_EN.pdf](https://deffner-johann.de/media/datasheets/2543001/DE/2543001_Technical_Data_Sheet_Primal_SF_016_DJ_EN.pdf)

AKEPOX® 2010

https://data.akemi.de/fileadmin/user_upload/products/productdocuments/TMB/Akepox_2010_TMB_D.pdf

¹ All links were last accessed on 13 May 2025.

EPO-TEK® 301-1

<https://www.epotek.com/docs/en/Datasheet/301-1.pdf>

Titebond Wood Glue

<http://sds.franklini.com/msds/1411.042k0nmo0020.pdf>

Paraloid™ B-72, Kremer

<https://www.kremer-pigmente.com/elements/resources/products/files/67400-67409.pdf>

Keim Granital®

https://www.keim.com/documents/de-AT/723/TM_Granital_DE-AT.pdf