

# Gold and Asian Lacquer:

## Application methods, degradation and related treatment considerations

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The Getty Conservation Institute (GCI) is engaged in surface cleaning studies of Asian lacquer and gilded wooden objects. Gold, a common decorative element in Asian lacquer, is applied using various specialized techniques. UV-fluorescence microscopy of cross-sections from lacquered objects reveal differences between gilded and ungilded areas: lacquer that received direct exposure to ambient light fluoresces more intensely than areas covered with gold leaf or powder. Pyrolysis-GC/MS analysis of gilded and ungilded lacquer showed an abundance of degradation products in the ungilded area. These findings help to inform future cleaning treatments of gilded lacquerware where light degradation has occurred.

### Metallic decorations on Asian lacquer

Lacquerware is a sophisticated craft with a long history in China. Various techniques were developed over the years for decorating the surfaces of lacquered objects with gold and silver. The decorative techniques of gilded lacquerware come in many forms depending on the materials used and the application techniques. The main ones are Chinkin/沉金/Qiangjin戩金 (Fig 1) and makie蒔繪 (Fig 2), of which there are many variations that often combine multiple techniques in combination. The Chinkin process involves using a carving knife to create grooves on a cured lacquered board to form a pattern. Cotton cloth is then used to apply wet lacquer into the grooves. Excess wet lacquer on the surface is wiped off with a dry cloth, leaving only the wet lacquer in the grooves. Finally, gold powder or gold leaf is applied onto the pattern and only adhered on the wet lacquer in the grooves. Makie蒔繪 is a Japanese decorative technique inspired by the Chinese “Miaojin描金” techniques. It involves painting a design on a surface using lacquer, and then sprinkling gold or silver powders on top after waiting for an appropriate level of adhesion. Depending on the location of the gold within the lacquer layer, it can be divided into togidashi-, hira-, taka- makie. “Nashiji梨子地” is a texture that resembles the skin of a pear with loosely sprinkled powder. In contrast, “ikakeji沃懸地” creates a texture with powder sprinkled in high density, and in addition to powder and gold leaf, there is also a technique called “kirikane切金” which use small pieces of cut gold foils. In “kakiwari描割” gold powder is applied outside the pattern line, so the outline shows the black lacquer under the gold layer.

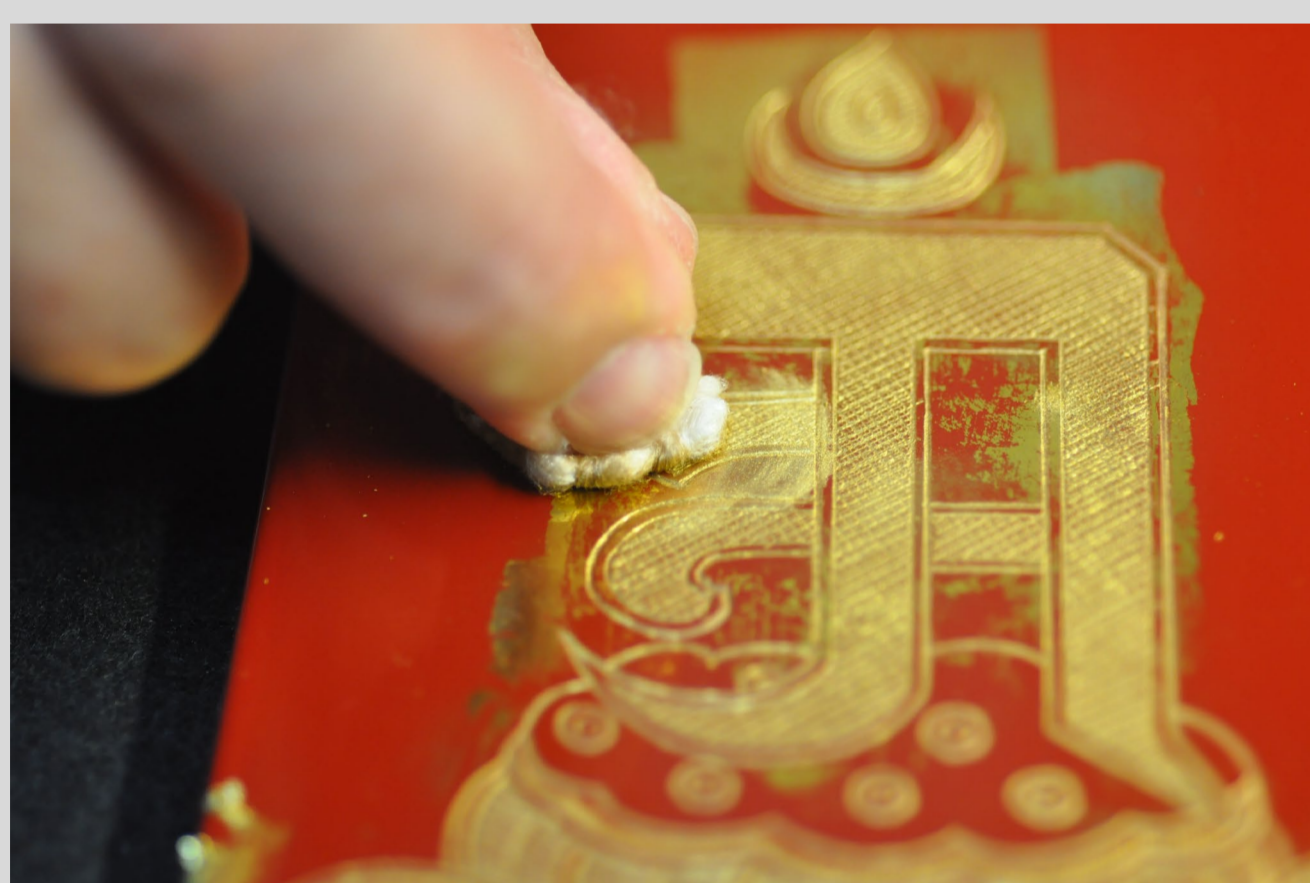


Fig 1: Chinkin. Using silk to pick up gold powder, gently and softly pushing the gold powder into the grooves in a circular motion. The gold powder will adhere to the wet lacquer surface, and after it is completely cured, use a silk cloth to wipe away the excess gold powder on the surface. (Yung-Chin Lin, Pei-Wen Wang)

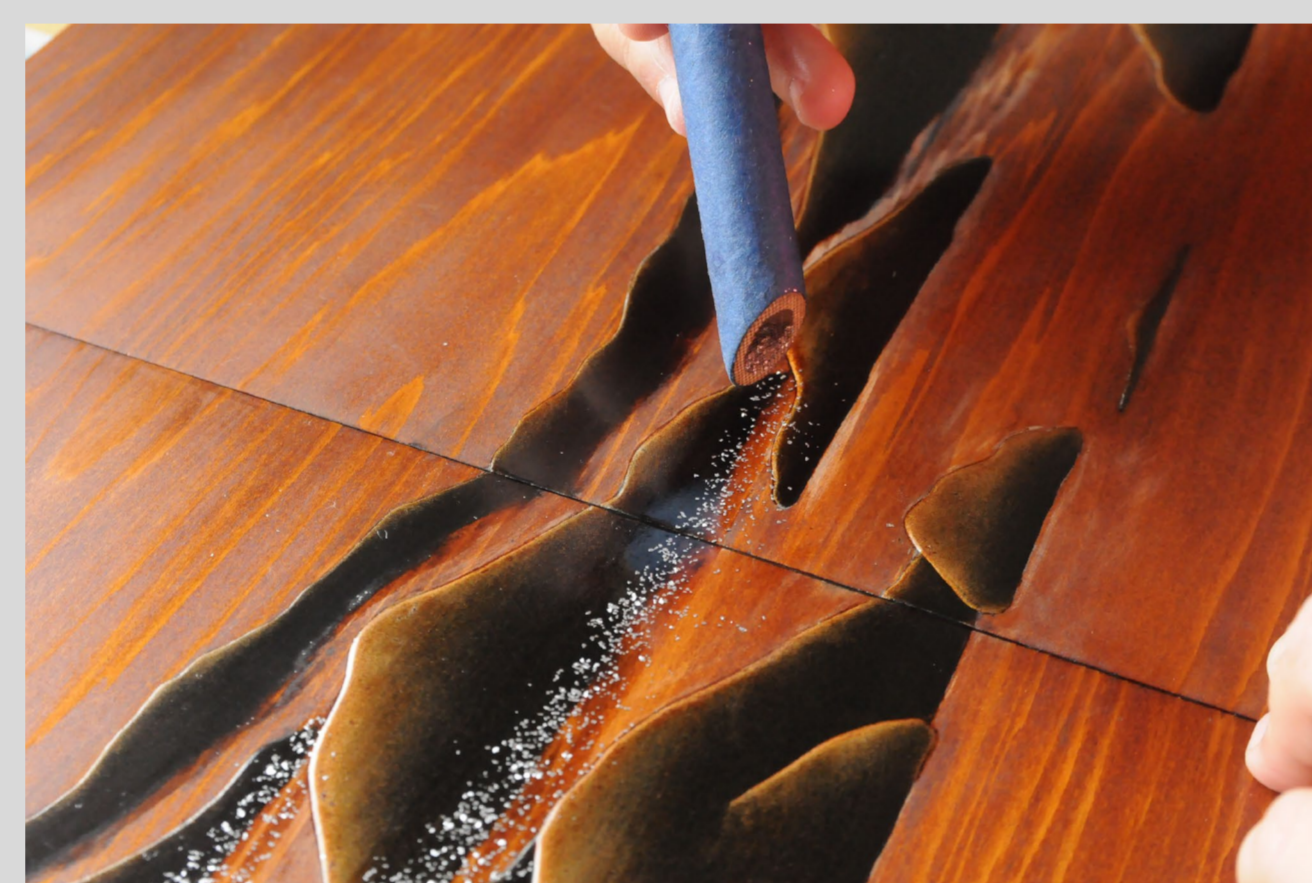


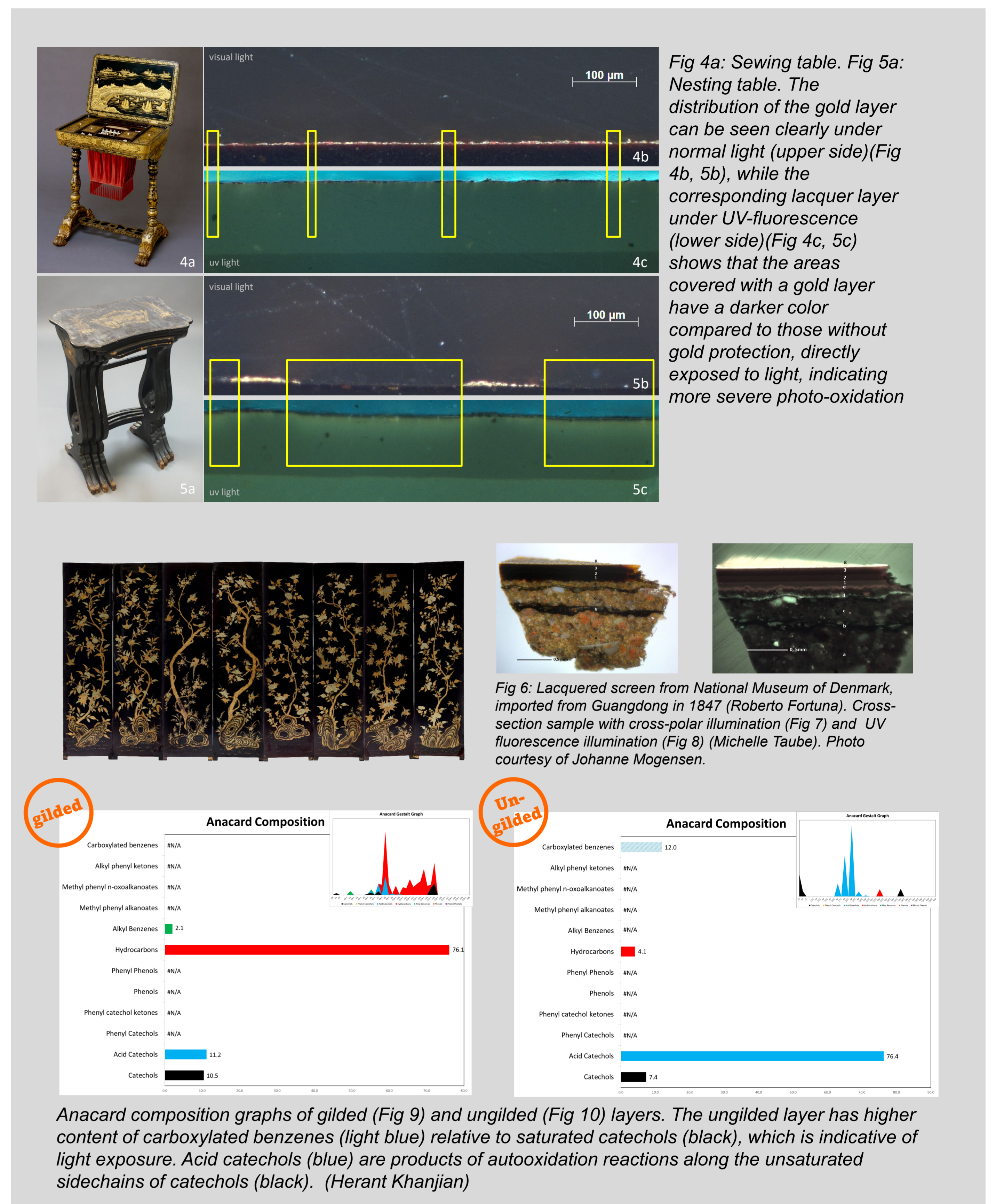
Fig 2: Makie. Different mesh sizes of “funtsutsu” are used to sprinkle gold and silver powder onto the wet lacquered surface, creating various rich effects. (Yung-Chin Lin, Pei-Wen Wang)



Fig 3: Chest of Drawers with Design of the “Eight Views of Ōmi”, LACMA

### Preliminary conclusion and further research

The process of deterioration of Asian lacquer surfaces seems to be inhibited by the presence of gold over the surface, creating differential degradation on a surface with localized gilded decorations. Visual observation of this phenomenon was confirmed by scientific analysis revealing the presence of more deterioration products in the lacquer without gilding on top. This observation could serve as a starting point for conducting additional cleaning tests. Indeed, the stability of gilded lacquer during treatment may differ between gilded and ungilded lacquer, and various gilding techniques may require different cleaning approaches.



### Protection of organic materials in lacquer by metallic decorations

Interestingly, these beautiful metallic decorations also appear to protect the underlying lacquer layers by blocking light that causes photodegradation of the organic materials in the lacquer formulations. This is shown in cross-section samples from two Chinese tables in the collections of the Peabody Essex Museum (Figs 4,5). Degraded lacquer is known to exhibit bright fluorescence in UV light, and the images show less fluorescence occurring directly beneath the gilded areas. This suggests that the gold layer served as a protective barrier for the underlying lacquer layer.

### Changes in lacquer composition with aging

The Getty Conservation Institute (GCI) has a long-standing interest in lacquer preservation. In the Characterization of Asian and European Lacquers project, a comprehensive THM-Py-GC/MS analytical method was developed to identify catechols and gums from lacquer tree saps, plus drying oils, resins, and other organic additives in microsamples removed from individual lacquer layers. The method also reveals degradation products formed by aging and light exposure. GCI scientists analyzed samples from a folding lacquered screen in the collections of the National Museum of Denmark (Fig 6, with cross-sections in Figs 7,8). The analysis of the lacquer layers with and without gold protection (Figs 9,10) showed high proportions of carboxylated benzenes and acid catechols relative to saturated catechols in the unprotected layer, which are indicative of photo-oxidation and aging.

### SELECTED REFERENCES

Mogensen, J.B., L.S. Eriksen, B. Höök, H. Khanjian, M.N. Mortensen, M. Schilling, and M. Taube. 2017. Two mid-19th-century Chinese lacquered folding screens still in use – Research and conservation. In *ICOM-CC 18th Triennial Conference Preprints, Copenhagen, 4–8 September 2017*, ed. J. Bridgland, art. 2103. Paris: International Council of Museums.

Mejiro Institute of Urushi Research & Restoration, 2020, Essential Bilingual Glossary of Japanese Urushi (Lacquer) Materials and Techniques

### PHOTO INFORMATION

Fig 3: Chest of Drawers with Design of the “Eight Views of Ōmi”, Japan, mid-Edo period, 1615-1868 - Lacquer over wood; gold and silver leaf, flakes, and powder (makie); silver mounts - Overall: 14 5/8 x 18 7/8 x 12 in. (37.15 x 47.94 x 30.48 cm) - Gift of the 2003 Collectors Committee - M.2003.60a-h - Courtesy of the Los Angeles County Museum of Art.  
Fig 4a: Artist in China - Sewing table, ca. 1835 - ivory, lacquer and wood - Overall 29 1/8 x 23 3/4 x 17 1/4 in. (73.98 x 60.33 x 43.82 cm) H x W x D - Gift of Francis B. Lothrop, 1970 - E82997 - Courtesy of the Peabody Essex Museum.  
Fig 5a: Artist in China - Nesting tables, ca. 1850 - wood and lacquer - 28 1/2 x 20 1/4 x 14 in. (72.39 x 51.44 x 35.56 cm) H x W x D see individual objects for credit lines, 1995 - 126018 - Courtesy of the Peabody Essex Museum.  
Fig 6: Chinese black lacquered and gold decorated folding bedroom screen, produced during the first half of 19th century - wood and lacquer - likely a present from Chinese authorities for the Danish King Christian VIII - A.10963 a&b - Courtesy of the National Museum of Denmark

### ACKNOWLEDGMENT

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