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# Investigation of Burmese lacquer methods: Technical examination of the V&A Burmese shrine

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ABSTRACT

More than one hundred samples collected from the V&A Burmese shrine were analysed to investigate the methods of manufacture of lacquer objects from Burma and the structure of the lacquer layers on this particular object, and establish whether there is any difference in the way the main body of the shrine and its decorative elements and satellite components were decorated. The differences we are looking for relate to the manufacture methods and the types of raw materials used. If found, these differences may suggest whether different workshops could have been involved. The samples were studied mainly as cross-sections by visible and ultraviolet microscopy, and additional spectroscopic techniques were performed when necessary. Duplicate samples from the same locations were sent to the Getty Conservation Institute (Los Angeles) to be analysed by pyrolysis gas chromatography mass spectroscopy (THM-py-GC/MS) and preliminary results by this technique are discussed here along with the microscopy results. Our findings show relevant differences in the stratigraphy of many of the shrine's parts, and using these differences we suggest a tentative grouping of the parts at the end of this article.



## 1. Research aims

The object of this study is a Burmese Buddhist shrine, part of the Victoria and Albert Museum collection (accession number IS.11-1969, see Fig. 1). It is a rare survivor from the royal palace at Mandalay, destroyed in the Second World War, and it is perhaps the only Burmese shrine of this type in western museums to have retained its accompanying offering vessels and accoutrements. The study was initiated in the hope that scientific analysis would clarify whether the accompanying parts were indeed made for the shrine and were contemporary with it rather than being later additions.[1]

## 2. Introduction

The V&A Burmese Buddhist shrine was made approximately between 1860 and 1880 by unknown artists or workshops. An army officer, Lieutenant Colonel F. D. Raikes (1848–1915) collected the shrine after the fall of Mandalay (1885) at the end of the third Burmese war. Raikes' documentation certifies that the shrine came from the royal palace at Mandalay and that it was brought to England where it has remained ever since. [1,2] The shrine was eventually given by Raikes to the Bristol City Museum and Art Gallery in 1906 and was deaccessioned by that museum in 1966. It was purchased by the V&A in 1969 [3].

The shrine is a very large object, 285.7 cm high, it is carved in gilt and lacquered wood inlaid with semi-precious stones, coloured glass and pieces of mirror. It consists of the main structure, a main Buddha figure and additional items. The items currently positioned in front of the main body of the shrine and also on the lower platform are various receptacles used during worship. In total, the shrine is composed of 31 parts (see Fig. 2): parts 1–12 constitute the main body; the remainder are "satellite" components of which parts 13–15, 18, 19 and 20 sit on or under the main body. The rest stand independently in front of the shrine. [4]

## 3. Materials and methods

### 3.1. Samples

Between one and five sampling locations were chosen for each part of the shrine, depending on the individual part's size and the presence of pre-existing damaged areas suitable for the removal of

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[1] The technical examination of the V&A Burmese shrine was part of a wider analysis campaign which encompassed lacquer objects from many Asian countries and constituted the main body of one of the authors' Master's Thesis (Valentina Risdonne, Comparative analysis of the stratigraphy of V&A Asian lacquer objects, London 2016).

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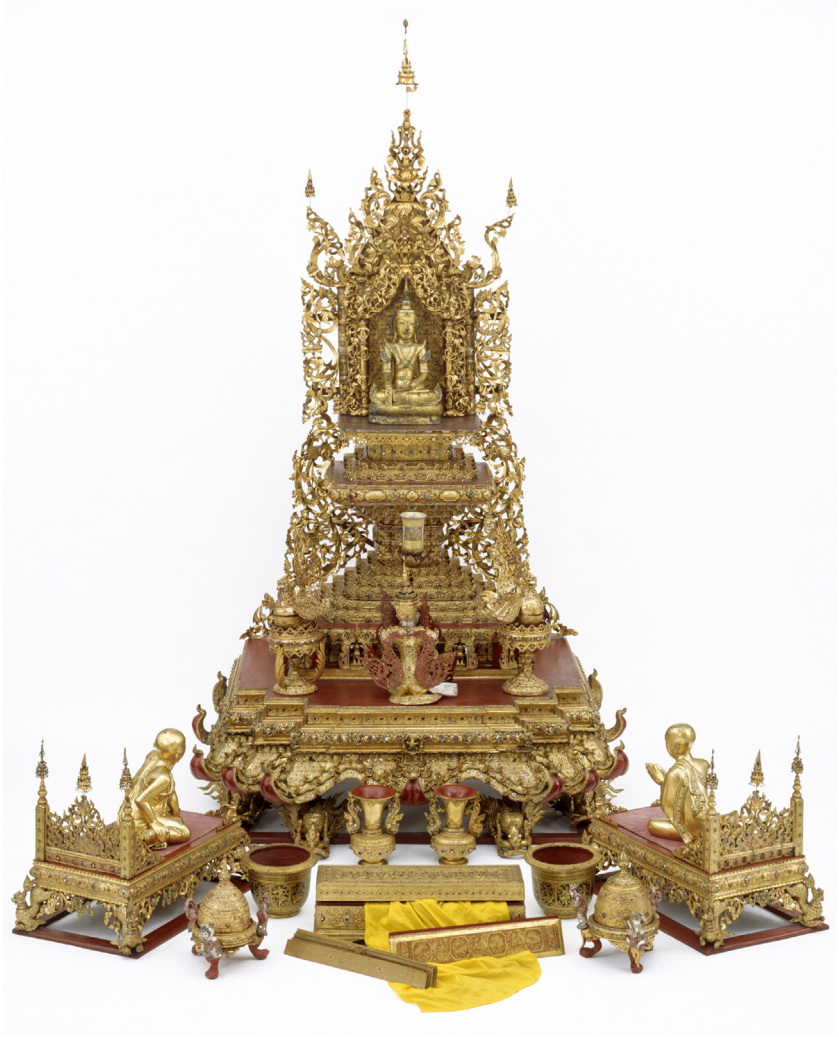

**Fig. 1.** The Burmese Buddhist shrine (accession number IS.11-1969).

samples (Fig. 3). From each sampling location, duplicate samples were removed with the expectation that their stratigraphy would be identical. The smaller sample, always less than 1 mm across, was used for optical microscopy analysis at the V&A; the larger sample, no more than 2 mm across, was set aside for THM-py-GC/MS analysis at the Getty.

### 3.2. Optical microscopy

Samples were preliminarily examined under a Leica MZ75 stereomicroscope, which was also used to set them in polyester resin. The samples taken for microscopy were embedded in clear casting polyester resin, polished and analysed under visible, far blue and ultraviolet illumination. All observations were made and photographs taken with the total magnification ranging between × 100 and × 400. The examination of the cross sections under visible light was carried out under a Leica Aristomet microscope. This microscope is equipped with three objectives (magnification of × 10, × 20 and × 40), a × 10 eyepiece and an optical zoom of up to × 2.5. A Leica Laborlux ME microscope equipped with a UV cube, three objectives (magnification of × 4, × 10 and × 25) and a × 10 eyepiece was also used. The illumination was provided by two CoolLED direct-fit pE-100 illumination systems, in the far blue region (435 nm) and near UV one (365 nm), respectively.

### 3.3. X-ray fluorescence analysis (XRF)

The XRF analysis of the embedded cross sections was performed with a Bruker ArtTAX XRF spectrometer (50 kV, 600 μA, livetime 100 s) equipped with a molybdenum source. The spot size is typically 200 μm.

### 3.4. Pyrolysis gas chromatography mass spectroscopy (THM-py-GC/MS) [5]

Additional samples were taken to be sent to the Getty for THM-py-GC/MS analysis to determine the composition of the lacquer layers. The samples were "excavated" layer-by-layer and each layer was analysed separately. The excavation was conducted under a stereomicroscope using both visible light and a high-intensity UV spotlight. Cross section photomicrographs were regularly consulted as sampling progressed to aid in the identification of each layer. Scrapings of the target layer were carefully extracted and placed in the well of a single-depression microscope slide. Collection of sample material was halted when the next, underlying layer began to be exposed and posed a risk of interlayer contamination. Layers more than 20 μm in thickness could usually be sampled discretely with little or no contamination from adjacent layers.

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