

Description of an Unusual Decorative Inlay Technique from the Late Eastern Zhou period

Introduction:

This lavishly decorated belt hook (ROM 931.13.80), in the Far Eastern Collection of the Royal Ontario Museum, was reportedly from Tomb "A" of the Jincun burials, old Loyang capital, Honan. The belt hook is dated to the Late Eastern Zhou period, 4th - 3rd Century BCE.

Description:

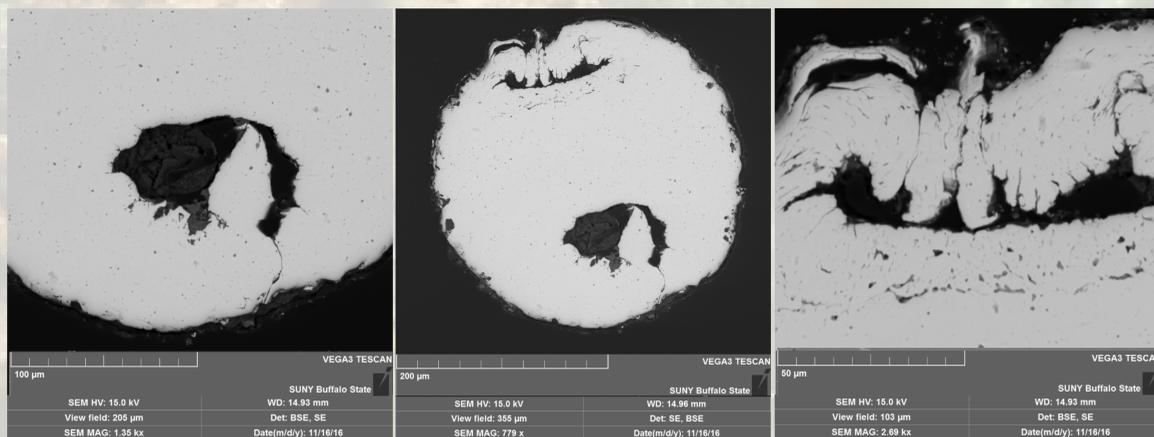
The belt hook is finely crafted of gilt copper alloy (bronze), covered with inlaid turquoise and a form of filigree (silver wire) forming cloisons along the body. The animal head finial is covered in gold foil with bead eyes. Radiography suggests that the finial may have been added onto the bronze body, but further investigation is required to confirm this. Inset around the turquoise and cloisons are areas representative of repoussé.



Figures 5 + 6: Close up of the belt hook showing the stacked rod wires creating a similar effect to repoussé. Image 6 shows the corroded bronze body with the wire that was removed for analysis

Analysis:

One wire was extracted from the side of the belt hook for metallographic and chemical analysis. The wire is ~250µm in diameter. It was manufactured by hammering down on a strip, mushrooming out the top and bottom prior to folding the edges in to create a rounded wire. SEM micrographs show this method well. Chemically, the wire is composed of almost pure silver with ~ 1-2 wt% copper. Elemental mapping revealed a relatively uniform composition with some higher copper concentrations likely due to solid state precipitation.



Figures 7-9: SEM BSE micrographs showing the folded effect of the sheet, transforming into a rounded wire shape. Some minor corrosion of the metal is visible at the ends and in the fold lines

Figures 10 + 11: SEM elemental maps showing the almost pure silver containing 1-2 wt % copper



Figures 1 + 2: Bronze body belt hook showing extensive corrosion, decorative cloisons and gilt finial. Radiography suggest the finial was added onto the main body

Conservation Treatment:

The object was brought to the ROM conservation labs for cleaning and repair, as the decorative detail was obscured by corrosion overburden and some of the cloisons were loose. During further microscopic examination and mechanical cleaning, an unusual decorative metal inlay technique was revealed. Metal inlays of the period tended to be flat pieces of foil or leaf placed into the decorative pattern over a metal substrate, and typically one of several techniques could be used to hold the inlay in place, including an organic or inorganic adhesive, or keying of the metal substrate itself. In an area of loss around the expected tiny punch-work domes of repoussé work, it became clear that the silver-like metal inlay was actually constructed from rods packed vertically into the space which formed the 'inlay'. Removing corrosion overburden confirmed this unique feature.



Figures 3 + 4: Close up of the turquoise and repoussé dome inlay surrounded by the finely shaped cloisons. A white ground appears to hold the inlay in place

Conclusion:

Early Chinese 'wire' was typically fabricated by rolling sheet or foil, creating a void in the centre. The use of miniature solid wire rods used in this fashion is unusual and certainly, rods arranged and packed vertically filling cloisons is a technique that has not previously been described in the literature making this example unique.

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