

CAT No. 71 - Pommel
K514+K1684+K1901
Condition Report

Conservation Started: 10.11.2010, 29/07/2015

Conservation Finished: 12.11.2010, 29/087/2015

Conservator: JW/ Kayleigh Fuller

Time Taken: Unknown/ 4 hours

Including digital photography, report, conservation and packing.

Dimensions: L. 31mm; W. 22mm; H. 15mm; Th. 1.5mm

Weight before: 8.65g (with soil)

Weight after: 10.43g

Digital photography:

The digital photos before treatment were taken with a Nikon Coolpix 4500 camera. Then during and after treatment photos were taken with an Olympus E620 camera.

Taken with a Canon EOS digital camera under daylight bulbs and Photomicrographs taken using Keyence VHX-1000 3D digital microscope with LED and/or fibre optic lights, 20-200x magnification.

Annotation on any of the storage bags or boxes:

X-ray: L33, L53

Description: Visual and microscopic examination using Meiji stereo microscope 7-75x magnification

Pommel of cast silver with relief/incised and moulded decoration, of round-back form. Incomplete (c. 90%) in 3 joining fragments (weathered breaks). Relief ornament cast, with detail added by incising. *Art:* apex surmounted by a moulded band with paired animal-head terminals; the two heads have blunt snouts and almond-shaped eyes. Sides have different animal (Style II) designs: one has two creatures (quadrupeds), affronted but separated by a herringbone band, which bite their own herringbone-filled bodies: the other shows a pair of knotted serpents. Each shoulder has a panel holding an interlaced serpent (mirror-reversed). *Interior:* hollow, two broken lugs cast in, one each end.

Associated Objects:

Pre-Conservation Condition: Visual and microscopic examination using Meiji stereo microscope 7-75x magnification

The object is in a deteriorated and possibly unstable condition, due to presence of the light green-grey copper corrosion products on the interior surface. This corrosion has soft and powdery texture that is typical of copper chlorides or bronze disease.

On the exterior surface the areas of darker green copper corrosion appears to be copper carbonates, which are stable, though somewhat disfiguring. The grey-black tarnish on the exterior appears to be silver sulphides, which have formed a relatively even patina. With this combination of corrosion and tarnish the exterior of the object appears to be dark grey-green. On closer examination the dark grey-

black silver sulphides predominate, and the green copper corrosion has formed in numerous areas in the dark grey-black patina.

The object is incomplete with almost one half missing and there is a 7.0 mm fragment of what appears to be granular soil that has fallen off the surface. The object is covered in considerable soil therefore before the investigative cleaning it was difficult to assess the condition of the object.

The soil is compact, relatively hard and well adhered to the silver alloy surface. It has a rough texture due to the numerous inclusions, such as quartz. The size of the inclusions varies up to ca. 0.5-1.0 mm and the colour of the inclusions ranges from transparent to translucent white to brown to dark brown/grey. These types of inclusions are abrasive, particularly since quartz has a hardness of 7 on the Mohs hardness scale, while silver has a hardness of ca. 2.5 – 3.0.

The surface of the silver alloy is worn and abraded with numerous scratches, small gauges, nicks and striations. This deterioration appears to be old and due to use wear, as there is soil in the scratches, small gauges and indentations and the high points are particularly worn. There is also soil on the broken edges indicating that the area of loss is old.

The dark grey-black tarnish has been worn down on the high points, such as the upper, undecorated area near the top of the oval-shaped interlacing decoration and on the upper part of the side with the interlacing geometric animal decoration.

There is a fine 5.5 mm crack across the head of the horse or dragon-like animal adjacent to the horse or dragon-like animal ornament. On the other side of this horse or dragon-like head there appears to be the top part of the same horse or dragon-like animal ornament, which suggests that the animal ornament was repeated on this side in the missing area. There are spots of green copper corrosion at the edge of this area of loss.

The soil on the exterior has adhered to the surface in some areas such as adjacent to the broken side and on parts of the horse or dragon-like animal decoration. It has a rough uneven texture and may include traces of the gilt silver surface. Further analysis of these areas after the investigative cleaning is recommended.

An outline of the interlacing geometric animal decoration is visible in this hard, well adhered soil on the area adjacent to the broken edge, as well as the outline of the top of another oval-shaped decorative element. This indicates that one side of the object had interlacing geometric animal decoration while the other side had the horse or dragon-like animal ornament.

On the underside of the object the surface is uneven and there is a buildup of soil, particularly in the recesses of what appears to be numerous lines or striations in the surface. These striations extend around the interior surface and are possibly part of the manufacturing process for the object.

There is a protruding piece of grey metal 5.5 mm on the underside that has a broken edge. Adjacent to this is an area of powdery light green-grey corrosion that appears to be copper chlorides/basic copper chlorides or bronze disease. Under the light green-grey powdery corrosion there is a raised area of harder darker green copper corrosion that appears to be basic copper carbonates. This area of corrosion is the most unstable part of the object, as copper chlorides can lead to bronze disease, which is an active type of corrosion as mentioned above. Therefore dry storage with a relative humidity (R.H.) under 40% is recommended for this object.

Treatment: Carried out using a Meiji stereo microscope

Purpose: Study

Aim: Total cleaning/ re-assembly/ stabilisation

Materials: Soft natural/synthetic brushes, thorn in pin vice/holder, IMS on metals, cotton wool swabs, cocktail stick, Paraloid B72 10% in acetone, 40% w/v Paraloid B72 in Acetone, Reemay Polyester netting 30gsm.

1. A 1 litre polypropylene (PP) Stewart container was prepared for the dry storage of the object, due to the presence of the powdery light green-grey corrosion on the underside. Two small zip lock polyethylene (PE) bags were filled with 50 g of orange indicating silica gel from Conservation Resources and placed in the Stewart container. The R.H of the silica gel was conditioned to 30% and the container was then sealed ready for the storage of the object after treatment.
2. The granular soil on the exterior surface was mechanically removed or reduced where possible using a fine thorn tip secured in a pin vice and a size 2 pure bristle paint brush with the tip cut flat. Ethanol applied sparingly on a fine pure bristle brush was used to soften the soil to facilitate its removal. Loose particles of soil were then removed with ethanol applied sparingly on cotton swabs. The soil was retained and stored in a small conical PP sample container to be kept with the object. This treatment did not remove the well adhered soil on many parts of the exterior surface, in particular the area adjacent to the broken edge, which may be connected with the presence of traces of silver gilt in these areas.
3. The granular soil on the interior surface was mechanically removed or reduced to expose more of the metal surface and the lines or striations extending around the interior. The same procedure as in step 1 was used. The soil was retained and stored in a separate small conical PP sample container to be kept with the object.
4. The soft, powdery light green-grey corrosion was mechanically removed from the interior surface where possible and stored in a separate PP sample container. This was done using a fine thorn tip secured in a pin vice and a size 2 pure bristle paint brush with the tip cut flat. The thorn was thrown away after use and the paint brush was rinsed in filtered water and then ethanol after use. The darker green copper corrosion underlying the powdery light green-grey corrosion was mechanically reduced, but not removed as this could disfigure the metal surface.
5. The K number was adhered to the interior surface with 10% w/v Paraloid B 72 in acetone, applied on a fine paint brush.
6. A new storage box padded with white PE foam was made for the object to support it inside the PP Stewart container with the 30% R.H. silica gel dry storage. A strip of Tyvek (spun bonded high density polyethylene fibres) was placed under the object as a cushion and also to help lift it from the PE foam support.

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Object was joined to K1684 using 40% w/v Paraloid B72 in Acetone. A support of polyester netting was adhered/ pasted to the inner side using 10% w/v Paraloid B72 in Acetone.

Post-Conservation Condition/Findings:

See pre-conservation condition from individual reports

Key Features:

- Silver cast pommel cap
- Incised serpent decoration

Samples:
see original reports

Analysis of related fragment K1684:

Surface XRF analysis was undertaken on the front of the pommel. A sub-surface area was prepared on the inside of the pommel to allow analysis of the core alloy.