

TREATMENT REPORT

Please see the attached figures and photographs.

Analysis

Several small fragments which had detached from the sword were embedded in epoxy resin and polished for examination under a metallographic microscope. While the fragments showed magnetic properties, thus suggesting that some metal structure might still be present, the cross-sections show that the fragments are almost entirely corrosion products, with several different zones of corrosion visible (See Figures 1-4). One notable feature in the cross-sections is found in Figure 4, where a polygonal shape shows two parallel striations; unfortunately, without the use of other analytical techniques, this feature cannot be characterized.

Cleaning

Burial concretions were mechanically reduced using scalpel blades as well as a Dremel tool with soft bristle brush bits. However, in areas the concretion was closely bound to the sword surface, it was left intact to minimize loss of original material.

Areas of active rust were mechanically excavated with scalpel blades. Corrosion inhibitors were not used in this case as none of those currently available provides adequate long-term protection against future corrosion.

The surface was cleaned with ethanol and acetone.

Consolidation/Stabilization

Exfoliating, flaking and powdery areas were consolidated with the conservation grade acrylic resin, Acryloid B72 in acetone. The consolidant was used in varying concentrations, ranging from 3% to 5% B72 in acetone to minimize darkening of the surface.

In structurally unstable areas, including thin edges and locations with losses or holes, pieces of Japanese kozo tissue impregnated with Acryloid B72 were adhered in place to provide physical support. Eleven reinforcement areas were stabilized in this way using a solution of 25% B72 in acetone (see photographs). The tissue was toned with Golden Liquid Acrylic colors to minimize its visual impact.