



ARTC Spotlight—March 2013

The University of Delaware's Art Conservation Department educates and trains professional conservators in the treatment, analysis, documentation, and preventive conservation of individual artifacts and entire collections. Our students are powerful public spokespersons for cultural heritage and its preservation. Visit our web site at <http://www.artcons.udel.edu> for more news about our students and other department activities.

Top: WUDPAC Fellow Marlene Yandrisevits mechanically reduces corrosion on the sword's blade using a scalpel. Inset: Micrograph of "weeping iron" corrosion products on the blade. Above: The placement and toning of a textured fill for the ray skin hilt grip. Right: X-radiograph of the sword (acc. no. A1104a,b) from the collection of the University of Pennsylvania Museum of Archaeology and Anthropology. Photos by Marlene Yandrisevits and WUDPAC Fellow Jen Schnitker.



Art Conservation *and historical arms*

Made of steel, brass, wood, leather and the skin of a saltwater fish called the ray, the sword and scabbard are unusual and of a type seldom seen outside the landlocked borders of the Kingdom of Bhutan. In that small country high in the Himalayan mountains, similar objects, known as *patags*, have been worn for centuries by court officers and are considered to be both ceremonial and functional. Highly prized, most are thought to remain in family collections.

This particular sword and scabbard, however, are in the Asian Section at the University of Pennsylvania Museum of Archaeology and Anthropology, which purchased them from a dealer in 1908. This year, it became a treatment project for Winterthur University of Delaware Program in Art Conservation (WUDPAC) Fellow Marlene Yandrisevits.

Marlene found that both the sword and scabbard showed signs of the wear they've experienced since they were constructed, sometime between the 17th and 19th centuries. In addition to being soiled overall, other issues included corrosion on the wooden scabbard's brass mounts and the sword's steel blade, a small loss in the ray skin grip on the sword, and separation of the ray skin mount from the scabbard. Some components, including the sword's lower hilt guard and the scabbard's uppermost ribbed collar, were loose.

Marlene began her treatment by gently cleaning the surface areas with a soft bristled brush and a HEPA-filtered vacuum with a fine cheesecloth covering. She then lightly tamped everything with a cosmetic sponge. She decided against trying to reshape the leather thong attached to the scabbard or the fragile ray skins. She did, however, repair the small area of loss in the skin on the sword's hilt by creating a patch out of an adhesive mixture backed with Japanese tissue paper. She carefully secured the patch in place by attaching it to the underside of the surrounding skin.

Marlene then addressed a type of unstable corrosion known as "weeping iron" that she found on the sword's blade. This type of corrosion, which results when iron reacts with chloride salts, is hard, rough and highly destructive. Using x-radiography, Marlene determined that surface corrosion had not significantly weakened the internal structure of the sword. Marlene used a scalpel to carefully slice off as much of the corrosion as possible and will apply a corrosion inhibitor to protect against further damage. Before returning the sword and scabbard to the Penn Museum, Marlene will secure loose components on the hilt using Japanese tissue paper and an adhesive and construct new housing for both pieces.

