

**Duke University
Rubenstein Rare Book & Manuscript Library
Treatment Report**

Artifact Number: HTRENT0019

Object Title: Perrot Bow Saw

Object Dimensions: 19.5 inches Long x 5 inches Wide x 2 inches High

Date Received: 02/16/2015

Date Completed: 02/20/2015

Conservator: Susanne Grieve Rawson

Object BT Description (attach sketches and photographs separately):

Introduction: The History of Medicine Collection at the Rubenstein Library serves as an important resource for Duke University students and researchers. While the majority of items in the collection are from the Trent Family, this unique assemblage of objects, documents, artworks, and archives is comprised of donations and loans from a variety of individuals and families. In an effort to exhibit a portion of the collection in the newly renovated Trent Room of the Rubenstein Library, select artifacts required conservation for long-term stabilization. Among these objects is a metal saw originally used for amputation or surgery.

Overview: This late 18th century saw is thought to be a Perrot design bow saw as indicated in curation records. The unique design includes a carved wooden handle with eight sides, a decorative steel frame and a sharp steel blade (Figure 1 and Figure 2).



Figure 1: Before treatment obverse view of HTRENT0019.



Figure 2: Before treatment reverse view of the HTRENT0019.

Terminology: The following terms are defined here to identify each area (Figure 3):

Frame: The steel body that functions as the main structure of the saw.

Blade: The thin steel platform used to perform the sawing action.

Handle: The grip for the saw, carved from wood.

Wing Nut/Tightening Screw: The copper alloy fastener used to secure the tang to the handle



Figure 3: Perrot saw terminology.

Description: The frame of the saw appears to be largely composed of steel and displays a central rounded decoration with two incised concave features to either side. The remainder of the frame continues to flare outwards in a bulbous formation with a scalloped decoration. A double banded incised concave decoration is also present half way down each edge of the frame. The top ends of the frame are squared off with one end of the frame leading to the handle and the other culminating in a point followed by the blade attachment.

The blade is designed to be replaced after a certain amount of wear and is secured with two screws (one of which is missing) on the left side and a pin on the right side. The blade has a dull straight edge on the top (interior facing the frame) and a sharp saw edge on the bottom composed of alternating teeth.

The tightening screw has a two part decorative element for attachment. The bolt appears to be made in one piece with the threaded end protruding through a hole in the frame with the other end securing the blade between two panels that have a trefoil shaped decoration. The wing nut itself is also a trefoil shaped frame with a threaded end for the bolt.

The hardwood handle of the saw is carved with eight sides beginning at the tang and culminating with a curved tip. A stain has possibly been applied followed by a varnish, but the general wear from use gives the wood a pleasant darkened and aged appearance. The bottom of the tang is visible at the base of the handle.

Object BT Condition (note corrosion, deterioration, stability, wear):

Overall, the saw appears to be structurally stable. A light layer of brown corrosion covers the iron surfaces (Figure 4 to Figure 8). There does not appear to have been any treatment performed on the saw historically as no varnishes or waxes are visible. The wood handle exhibits a medium sized crack that extends all the way to the base of the carved curl at the bottom of the handle and small marks on the outer surface from general use (Figure 9 and Figure 10).



Figure 4: Detailed view of the tightening screw and blade configuration. Note the layer of brown corrosion over the iron surfaces.



Figure 5: Detailed view of the light layer of corrosion on the saw blade.



Figure 6: Detailed view of the frame demonstrating the light layer of corrosion on the iron surfaces.



Figure 7: Detailed view of the decorative area on the frame demonstrating the light layer of corrosion on the iron surfaces.



Figure 8: Detailed view of the decorative area on the frame demonstrating the light layer of corrosion on the iron surfaces.



Figure 9: Detailed view of the wooden handle demonstrating the large crack on the interior.



Figure 10: Detailed view of the wooden handle showing marks on the exterior surface.

Test/Analysis (i.e.: pH, material type):

Magnetism: Various metal components were tested to determine if iron alloys were present. Iron was positively identified on the blade and frame.

Additional testing was not deemed necessary for treatment at this point.

Treatment (note date and details):

The overall treatment goals were to retain the historical authenticity of the object with aims to stabilize rather than restore.

Before Treatment Documentation: Before treatment began, several images were taken of the saw to document areas of damage and changes using a Nikon Coolpix L120® digital camera. Settings were selected based on the environment and a white or black background was used.

Mechanical Cleaning: The saw was vacuumed to remove any loose particulate matter using a HEPA filtered vacuum. Close attention was paid to the cracked and creviced features. Loose corrosion was cleaned using bamboo sticks, a glass bristle brush and Garry flex metal cleaning sponges®.

Chemical Cleaning: The surface of the saw was swabbed with 100% acetone to degrease and prepare the metal for coating.

Coatings: The metal was coated with Renaissance Wax® as a protective coating and buffed using a Kim-Wipe®.

After Treatment Documentation: After treatment images were taken of the model to document changes using a Nikon Coolpix L120® digital camera. Settings were selected based on the environment and a white or black background was used.



Figure 11: After treatment obverse view of HTRENT0019.

Exhibition/Storage Suggestions (i.e.: light levels, humidity):

While the Rubenstein Library already strives to maintain the ideal environment for the collection, there remain some suggestions that are unique to the saw.

Environment

Similar to other objects of this type, an environment of *40% to 60% relative humidity* is recommended. While the metal components are best to be stored at a lower relative humidity, the wooden components of the object are reactive to excessive drying that could cause additional cracking. The coatings on the metal objects will act as a protectant against environmental changes. The storage temperature should range *65° to 70° F*. General museum lighting guidelines are also suggested for a maximum of *50 lux* cumulative exposure with the main concern being the wooden handle which is sensitive to light damage.

Handling

The coatings on the metal components will provide protection during handling and prevent further deterioration from oxygen and moisture. A new coating of Renaissance Wax® can be applied every few years to renew the surface against abrasion from handling. The main area that should be handled with care is the wood handle that is weakened by previous damage.

Present Damage

The crack present in the wood handle continues to be a concern. Cracking is common to these types of objects where an organic component surrounds a metal core. While the crack specific to the saw can be seen as inherent vice of the object, there are also other factors that can cause enhanced damage. It is not recommended to fill the wood of the handle for aesthetic purposes. A fill may prevent the crack from closing naturally in a high humidity environment and cause the crack to worsen. As noted above, handling is also a concern and care should be taken not to squeeze the handle too tightly and to prevent cotton gloves from snagging on any rough areas of the crack. Lastly, too dry of a humidity can also cause the crack to become wider and continue into the base of the handle.