

Iron Burgonet Treatment Report

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Date: 05-08-2021	Lab no: 3791	
Object: Helmet	Material: Steel, Brass, Leather	

Description:

This helmet is 34.5 cm long, 32 cm wide, and 30 cm high when ear flaps are flush to the surface. It is made of iron or steel, with brass coated rivets and leather straps, where are mostly missing. It is likely from the 16th century, in the burgonet style of helmets (Pyhrr, 2000). There is a single added plate riveted in the back as a neck guard, an elongated visor in the front and two hinged ear flaps that are perforated in order to allow a wearer to hear properly. It is not highly decorated, with some simple worked areas on the rim, comb, and visor of the helmet. Remnants of a leather chin strap can be seen on both ear flaps, and the neck guard demonstrates several empty rivet holes which suggest that other pieces may have been attached for decoration.

Condition:

The helmet is relatively corroded, most of the layers are stable, however active corrosion can be seen on the surface and in the inner section of the ridge in the form of orange, powdery bloom. There is also white bloom on either ear flap. The main body of the helmet is missing two rivets but is generally stable. However, both of the ear flaps are slightly loose due to wear on the rivets. On the proper left side of the helmet, one rivet is missing on the ear flap, causing the hinge to be extremely loose. On the other earflap, there is evidence of a previous repair to the hinge in the form of a long wire replacing the original hinge. However, there is no previous conservation work recorded for this helmet, suggesting that this repair is historic (van Hak, pers. Comms.). An unknown waxy residue can be seen in some of the perforations on the ear flaps and on the inside of the back of the helmet.

Analysis:

The helmet was x-rayed in order to better understand the construction of the helmet and the historic repair.

The x-ray (fig. 1) demonstrates that though there are rivets on the front of the helmet, the visor is part of the main body, not an added separate piece (Flynt). The x-ray also shows the loose wire that was used to repair the proper left ear flap.

Conservation Treatment:

The goals for treating the helmet included limiting any future corrosion and protect the metal from further damage and discolouration. This did not include bringing the metal back to an extremely polished surface, as this would not improve aesthetic value and remove evidence of wear and use. Both ear flaps were stabilised in order to ensure their longevity.

First, the hart concretions and white bloom on the helmet was removed primarily with a scalpel and a dental pick. Following this, 3-in-One oil was applied to both the inner and outer surfaces, and a brass bristle brush was used to aid in the removal of thick corrosion layers. Then, the surfaces were further buffed using 000 steel wool. This removed much the darkened surface and active corrosion on the helmet. A rust converter was not deemed necessary for these surfaces. Tannic acid or other rust converters would have changed the colours of the surface of the helmet, as well as hide the "3" in white that can be found on the back of the inside of the helmet. After this, the helmet was degreased using acetone, applied with a microfibre cloth, this ensures that no oil remains on the

surface of the metal, as this can damage it. The 3-in-one oil and steel wool was not used on the brass rivets, as they were not severely corroded.

For the proper right ear flap, the historic wire was removed and straightened out (fig. 2). The thread was cleaned up and the wire was reinstalled and tightened in order to limit further shifting and strain on the hinge. This was chosen as it was the least invasive option. The larger rivet on this ear flap was also consolidated using 40% paraloid B72 in acetone and glass microballoons which limits the strain and wear of the rivet on the helmet.

The proper left ear flap which is missing a rivet was consolidated using 40% paraloid B72 in acetone and glass microballoons. However, this was determined to not be stable enough, and a 6mm x 3mm nickel plated neodymium magnet coated in 6% paraloid B72 in acetone was added to the outside of the rivet in order to further support the hinge.

The small remnants of leather on the bottom of either ear flap was consolidated using SC6000, a wax and acrylic resin that will help limit further deterioration (Kite and Thompson, 2005).

Finally, the helmet was hot waxed. This involves using a hair dryer to heat up the metal surface before applying Renaissance microcrystalline wax using a microfibre cloth. The metal is then allowed to cool before being buffed with a clean microfibre cloth to remove the excess. This helps protect the helmet from dust which may cause further corrosion.

Storage Recommendations:

The helmet should be stored at as low RH as possible (ideally between 35-50%) (Logan, 2007). A Tyvek cover and stand have been provided in order to help limit dust accumulation on the helmet and lessen strain on the hinges of the ear flaps.

Handling Requirements:

Lift whole unit from the black stand, with two hands. Wear gloves whenever handling the helmet itself. The helmet itself should be picked up whilst holding both ear flaps in place in order to protect them from strain and further damage.

Bibliography

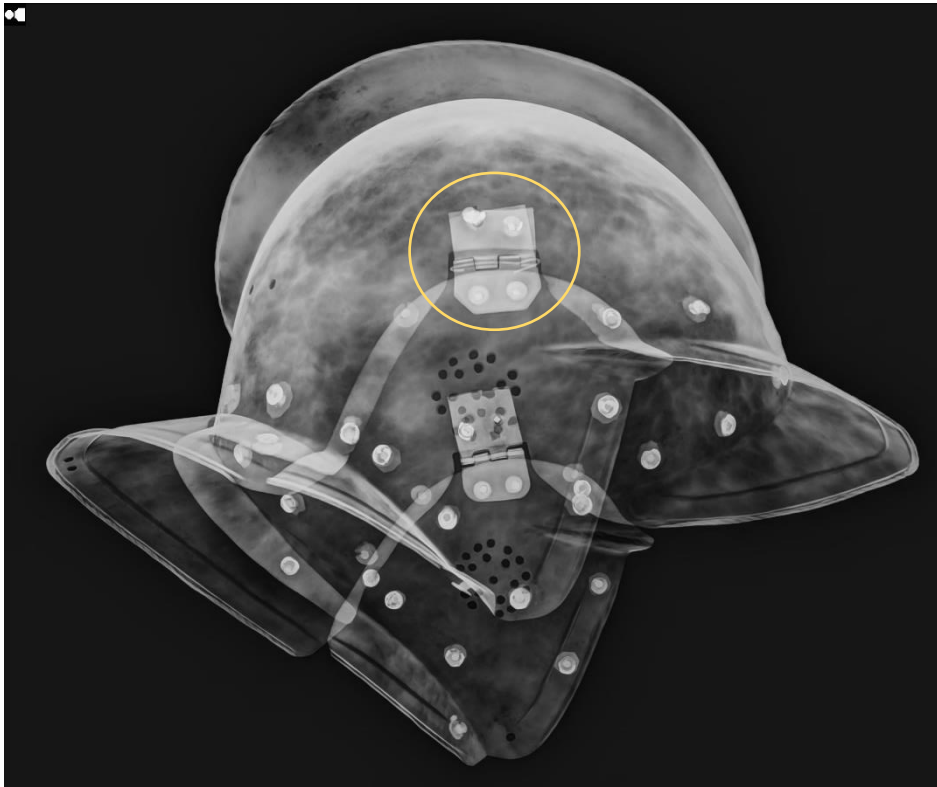
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*Figure 1: x-ray of the helmet demonstrating the historic fix on the proper right ear flap (circled)
(photo by Vicky Garlick)*



Figure 2: The wire of the historic repair of the ear flap after being removed. It was then cleaned using steel wool and 3-in-one oil, as was the hole it threaded through before being re-threaded and bent back into place, tighter than previously to support the hinge (photo by author)

Before Treatment:







After Treatment:





