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Florida's Storm Wreck

— Conserving Three Brown Bess Muskets Found

PHOTO COURTESY OF SARA BROCKMANN, FLORIDA DEPT OF STATE

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Photos courtesy of the St. Augustine Lighthouse and Maritime Museum and Sara Brockmann, Florida Department of State

In 2009, underwater archaeologists from the St. Augustine Lighthouse and Maritime Museum discovered a site dubbed the 'Storm Wreck' in the murky waters off St. Augustine, Florida. Analysis of the artifacts revealed that the Storm Wreck dates to the end of the American Revolutionary War. The vessel was apparently one of 16 Loyalist refugee vessels that left Charleston in December 1782, bound for British-controlled Florida, only to wreck off the coast of St. Augustine.

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As archaeologists from the St. Augustine Lighthouse Museum explained, "Artifacts from this ship tell a story of plight." As the Revolution ended, colonists loyal to Britain fled the newly-formed United States of America with whatever they could carry. As the wreck revealed, this included arms. Among numerous other artifacts, archaeologists recovered three Brown Bess muskets from the seafloor. They were later transferred to the Florida Department of State, Bureau of Archaeological Research Conservation Laboratory in Tallahassee, Florida, for treatment.

When archaeologists recover artifacts on land or underwater, the precise location of each object is meticulously recorded, because the spatial relationship of artifacts to one another can reveal enormous amounts about the past. This is one of the reasons why divers should never disturb historic shipwreck sites. However, what is not as widely known about maritime archaeology is what happens to artifacts once they have been removed from the water. Here, just as much care needs to be taken.

Conservation measures

When an artifact leaves a wet environment, most materials require some sort of treatment, from moderate to quite exten-

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sive, in order to reach equilibrium with their new, dry environment. Artifacts removed from the ocean need special care because materials can be infused with salts that wreak havoc as the object dries, causing structural damage. The treatment of artifacts removed from water has spawned a subset of archaeology, marine artifact conservation, practiced by archaeological conservators, who guide artifacts through the transition from aquatic to terrestrial environments. This can be a complicated process, depending upon what materials make up an artifact.

The consequences of leaving artifacts untreated can be readily apparent. Old anchors and cannons are a common sight in front of restaurants or hotels in seaside towns. Sadly, these are often slowly disintegrating because they did not receive proper treatment. You may also have seen what can happen to wood that's been submerged for long periods and then quickly dried. It splits, cracks, and falls apart.

Muskets from the Storm Wreck present archaeological conservators with the challenge of conserving complex artifacts. The muskets are made from multiple materials that require different treatments. The locks and barrels are made of iron, the stocks are wood, and the trigger guards, ramrod pipes, and side and wrist plates are made from brass.

Documentation and treatment

To begin the conservation treatment of the muskets, conservators document and photograph the objects. The muskets are constantly kept wet, and pneumatic chisels, called airscribes, are used to clean concretions (iron corrosion products) away from the surface of the wood stocks and brass parts.

In most cases, iron objects from underwater sites are surrounded

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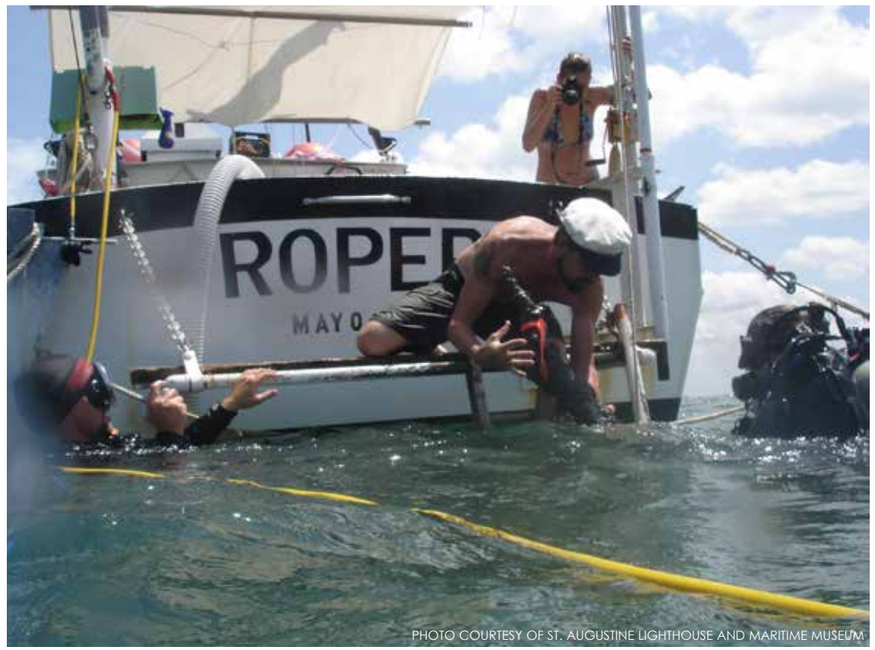

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by concretion. In some cases, the original iron artifact can degrade or corrode completely. However, within the concretion, the original dimensions of the object are preserved as negative space.

Even though the artifact is gone, the void left behind retains the object's shape. In this case, conservators can fill the cavity with epoxy to make a perfect copy of the original object. They use x-rays to help determine when this is necessary, and where the voids are and where they can be filled with epoxy.

After the concretion is removed, an epoxy replica remains, in the shape of the original artifact. The iron locks on the muskets are preserved in the surrounding concretion in the same way. Because the locks have completely corroded away, conservators can make casts of the empty cavities.

Extensive treatment

In other cases, the iron artifact survives and requires more extensive treatment. Electrolytic reduction is used to remove chlorides from iron objects, such as cannons or anchors. This stops the corrosion caused by the presence of chlorides. Not much of the original iron remains on the Storm Wreck muskets, and only parts of two barrels have survived, but what is left will undergo electrolysis. Following electrolysis and the removal of the electrolyte using consecutive boiling rinses, the objects can be treated with tannic acid and microcrystalline wax, to seal them off from the surrounding environment.

The conservation of wood often requires soaking in water with a progressively higher concentration of the bulking wax, polyethylene glycol (PEG). Various processes at play in the aquatic environment greatly degrade the cell walls in wooden objects, and these interior areas need to be fortified with wax. PEG helps reduce or eliminate these effects. In the case of the Storm Wreck muskets, the wooden stocks are soaked in PEG while conservators slowly add higher concentrations, which allows the PEG to fully infuse into the wood. The entire process takes months to complete, but the treatment results in a stable wooden object that can be displayed.

The brass parts of the muskets will undergo a treatment similar to iron objects. They will go through electrolysis to lower the chloride levels. After three boiling rinses, they will be dried and coated in an acrylic resin sealant.

When all of the components are conserved, the muskets will be reassembled and put on display. This example of the three muskets from the Storm Wreck demonstrate the importance of artifact conservation. Now invaluable pieces of history will survive for future generations to learn from and enjoy. To learn more about the Storm Wreck, visit the St. Augustine Lighthouse and Maritime Museum to see their exhibit, "Wrecked!" opening May 5, 2016. ■

REFERENCES:
FLORIDA DIVISION OF HISTORICAL RESOURCES COLLECTIONS AND CONSERVATION LABORATORY (HTTP://DOS.MYFLORIDA.COM/HISTORICAL/ARCHAEOLOGY/COLLECTIONS-AND-CONSERVATION)

ST. AUGUSTINE LIGHTHOUSE & MARITIME MUSEUM – STORM WRECK (HTTP://WWW.STAUGUSTINELIGHTHOUSE.ORG/LAMP/RESEARCH/STORM-WRECK)

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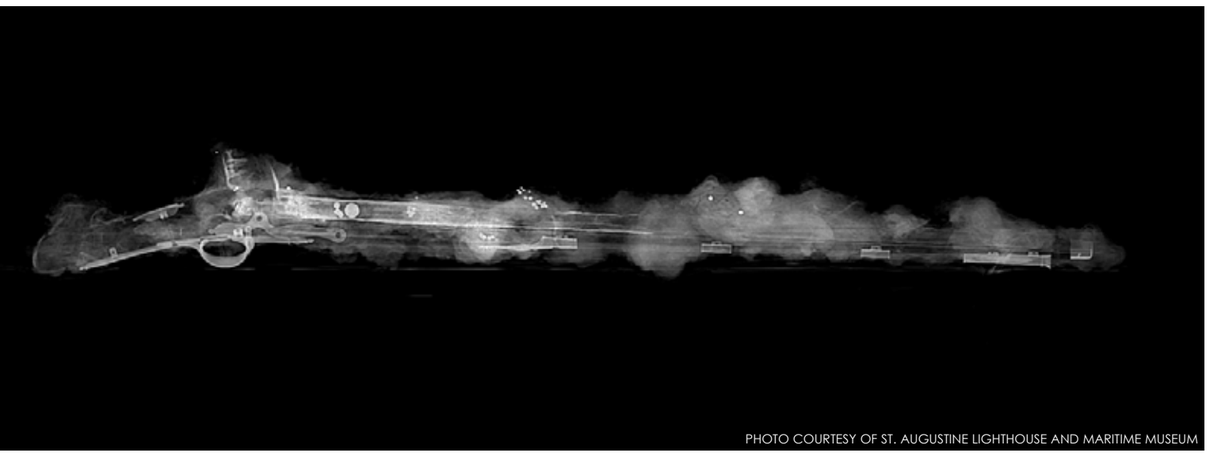

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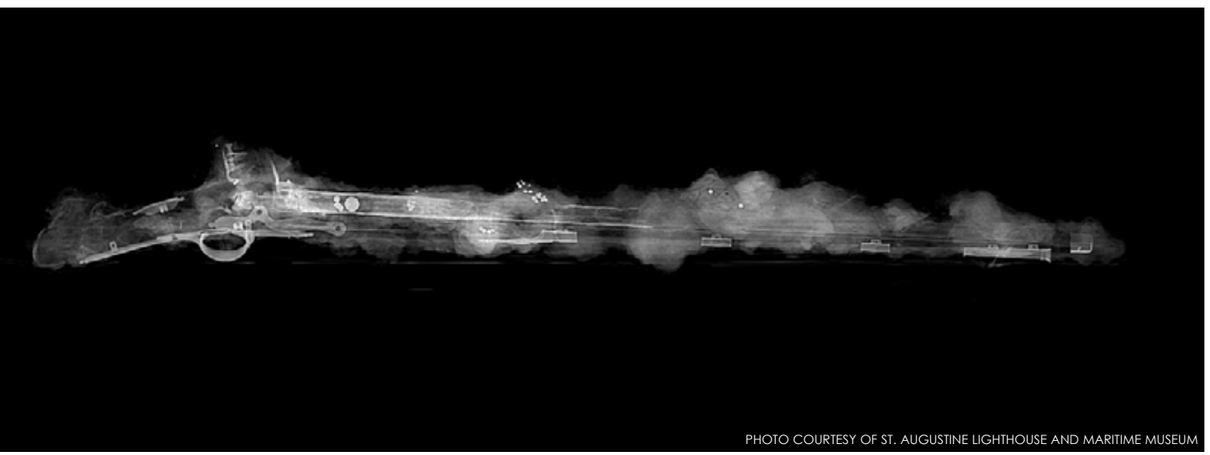

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