



# Shipwreck CSI:

Marine archaeology is a specialized science that combines techniques developed by land-based archaeologists, geologists and forensic specialists (to name a few). Documenting and excavating a site means adhering to strict scientific standards. The precise location of every artifact must be recorded and its condition documented just like crime scene investigators do with evidence found at a crime scene. The goal with both is the same, to reconstruct the past!

All artifacts and other features, such as a ship's timbers, are measured, drawn in detail, and photographed. Archaeological excavation underwater is usually done by hand with the aid of a hand-held dredge, commonly called an "air-lift." Sediment is often screened so that not even the smallest artifact is lost. The

excavation of a shipwreck can include the recovery of very large artifacts, such as a 20-foot long anchor, along with delicate ones such as fragments of sailcloth or paper and even the remains of rodents and insects that once lived below deck. Samples are taken for laboratory analysis to determine species or substance identification, metallurgical composition and/or radiocarbon dating.

A shipwreck is more than the sum of its parts. But, the parts provide important information, too! Everything that was on board a vessel, everything that was con-

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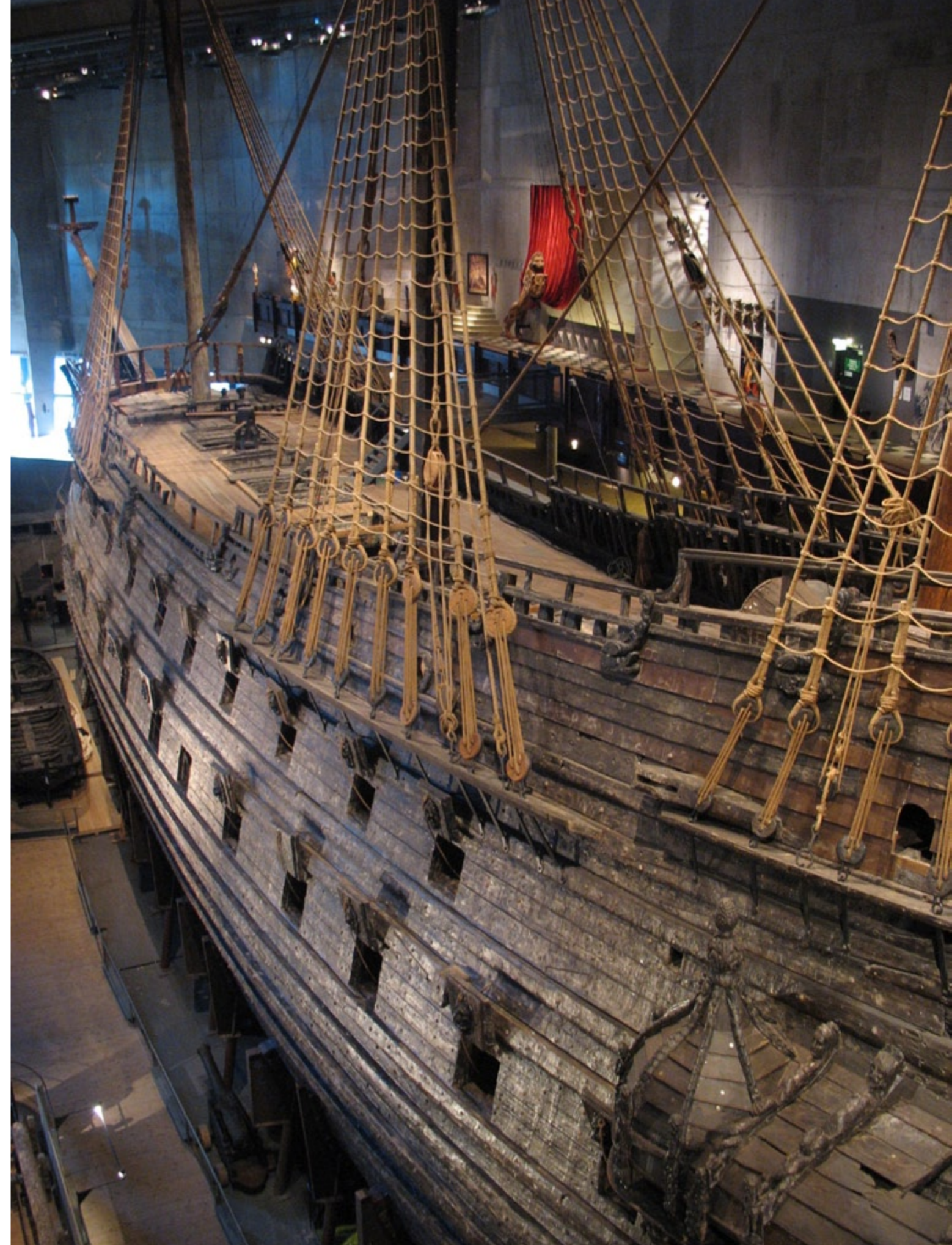
sidered indispensable for a voyage, might potentially be preserved. This includes organic artifacts made

of wood, bone, cloth or leather. Once out of the water, artifacts can be destroyed as they dry out. Most objects recovered from the sea must be treated to prevent them from deteriorating further. A cannon, for example, can take years of electrolytic and chemical treatment to stabilize. Different treatments are required for different materials.

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More than 20 countries around the world, which have endorsed UNESCO's Convention on the Protection of Underwater Cultural Heritage, now advocate the *in situ* preservation of marine archaeological sites. This means leaving them undisturbed where they're found!

Sometimes this isn't in the best interest of a site though. Just like on land, an underwater archaeological site may be threatened by construction or dredging, such as the expansion of a harbor. What needs to be considered is the long term preservation of cultural heritage underwater. Sometimes this means removing artifacts from the sea, even an entire shipwreck. Recovering, conserving and preserving artifacts, and exhibiting them in a museum, can also enhance people's appreciation of history.







Cannons  
Un-conserved.  
When iron arti-  
facts that have  
been underwater  
for a long time  
are exposed to  
air they quickly  
deteriorate if left  
untreated

"The relocation of certain shipwrecks (and the artifacts contained within) from their original sites to museums or marine parks may potentially bring higher values to society by providing wider exposures or recreational use opportunities," says noted shipwreck management expert Porter Hoagland.

The best example of this is the Swedish warship, *Vasa*. It sunk in Stockholm harbor after being launched in 1628. Discovered in the late 1950's, the wreck is now considered a national treasure and is one of Sweden's most popular tourist attractions. More than one million tourists from around the world visit the dedicated shipwreck museum each year.

Conserving and preserving the massive 201-foot long *Vasa* and its contents was no easy job! Once exposed to air a ship's timbers dry out, crack and warp. To prevent this, the ship had to be thoroughly cleaned with fresh water during the summer of 1961.

Wooden components were then saturated with polyethylene glycol (PEG). Three thousand liters of the liquid plastic was sprayed inside and outside the hull once a day for more than 20 years.

Individual artifacts were treated in a sophisticated lab especially built for the task. Many required years of detailed work. Technical and operational difficulties had to be overcome. Never before had such a large marine archaeological project been undertaken.

Nor has the work stopped! In recent years, scientists were concerned about the rapid spread of sulfate salts and elemental sulfur on the wooden parts of *Vasa*. It was determined that the museum's humid atmosphere was allowing the sulfur contained within the ship's wood and iron parts to oxidize.

Fortunately, a solution to the problem was found. The part of the museum that houses the *Vasa* was especially renovated to cre-



ate a climate-controlled environment for it. Now, the area has a constant humidity of 53 percent and a temperature of 17°C.

With a total surface area of four acres, the *Vasa* is the largest wooden and organic archaeological artifact in the world to undergo conservation and preservation. New techniques were especially developed for it. And, such work became the impetus for even newer ways to conserve and preserve other, more recent, shipwreck finds.

—Rob Rondeau  
Marine Archaeologist  
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