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New technology solves lingering questions in Jamestown collection

JAMESTOWN, VA. (March 5, 2024) –

With the help of donors, new technology is solving old and new mysteries in the Jamestown artifact collection. With the support of the James H. and CarolAnn Babcock Fund for Archaeological Research and Technology, the Collections and Conservation department has recently acquired upgraded X-radiography equipment and purchased a nondestructive Handheld X-ray Fluorescence (HH-XRF) analyzer and a micro-destructive Laser Induced Breakdown Spectroscopy (LIBS) analyzer. These new tools allow Jamestown archaeologists, conservators, and educators to continue interpreting artifacts excavated decades ago as well as those just unearthed.

The addition of Handheld X-Ray Fluorescence (HH-XRF) to the conservation lab has made the study of artifacts more efficient, less expensive, and less invasive. HH-XRF analysis uses X-rays and a detector to identify elements present in an object through a complex process that measures energy emitted from the excited material. Recently, Senior Conservator Dr. Chris Wilkins used the machine to analyze a gold signet ring with a displayed eagle that may have been William Strachey's personal seal. Strachey was shipwrecked on the *Sea Venture* on his way to Jamestown in 1609, became Secretary of the Colony in 1610, and wrote an account of the *Sea Venture* disaster that may have inspired William Shakespeare's play, *The Tempest*. HH-XRF revealed that the gold signet ring is, in fact, tinned copper alloy, not gold.

X-Radiography is a critical part of the conservation process, as well. Jamestown conservators can now X-ray almost every single iron artifact in the Jamestown collection. This technology was a key part of the excavation of the Governor's Well last summer. "Many of the artifacts recovered from the well were iron and were obscured by significant corrosion," said Dr. Wilkins. "Having an upgraded X-ray machine meant we could, literally within minutes of an artifact coming out of the well, bring it into the lab and X-ray it to begin planning the next steps for conservation. X-radiography also allows us to determine the condition of the object before conservation, and sometimes the significance, meaning we don't spend valuable time conserving very common artifacts like nails." Unique characteristics seen through the corrosion in an X-ray, like a potential maker's mark or the style of an intact pommel, expedite historic analysis of artifacts and the well itself, helping to fill in the gaps of Jamestown's past.

Laser Induced Breakdown Spectroscopy (LIBS) analysis is being used to study many different materials in the Jamestown artifact collection, including an in-depth analysis of Native ceramics with a goal of identifying specific origins of the potsherds excavated at Jamestown. The early colonists were largely fed through the generosity of the Indigenous communities surrounding them. Research on the clay pots that were used to cook and transport the shared food may tell us more about who was interacting with the settlers. This ongoing project will ultimately examine hundreds of native ceramics in the Jamestown Rediscovery collection, making the LIBS

machine, which produces qualitative results fairly immediately, an indispensable tool for research. For quantitative analysis, qualitative results are only the first step of a long, thoughtful process involving data mining, multivariate statistics, and a logic intense software program.

Understanding artifacts is key to understanding the history of Jamestown. Tools like X-rays, HH-XRF, and LIBS add to the deep historical knowledge of Jamestown Rediscovery curators, conservators, archaeologists, and historians, helping us solve decades-old mysteries and reveal new clues about Jamestown history.

The James H. and CarolAnn Babcock Fund for Archaeological Research and Technology has been instrumental in supporting new and cutting-edge equipment for Jamestown's archaeology program and lab. With this critical funding, Jamestown conservators and curators continue to work on the forefront of archaeology technology.

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[Available photos can be found here.](#) All images courtesy of Jamestown Rediscovery Foundation.

About Jamestown Rediscovery Foundation

The Jamestown Rediscovery Foundation (JRF) preserves and shares the original site of James Fort and Jamestown, established in 1607. JRF is dedicated to uncovering, preserving, and sharing Jamestown's diverse history, and highlighting its major contribution to the foundations of modern American society. Jamestown Rediscovery Foundation is a private 501(c)(3) nonprofit. JRF jointly administers Historic Jamestowne alongside the National Park Service. For more information about visiting Jamestown, please visit www.historicjamestowne.org or call (757) 856-1250.