

# MUSEUM INVESTS IN DIGITAL IMAGING X-RAY TECHNOLOGY

*The Colonial Williamsburg Foundation (CWF) is the oldest and largest living history museum in the United States, offering access to a 301-acre Historic Area and outstanding museum exhibits for visitors. It is an active site for archaeology and research, with significant cultural collections, such as decorative art, American folk art, and architectural materials. The Foundation's collections represent a wide range of media such as paper, ceramics, textiles, various metals and wood.*

As part of their meticulous investigation into the history and construction of these objects, as well as repairs and changes that may have been performed in the past, CWF recently added DÜRR NDT Computed Radiography (CR) and Direct Radiography (DR) capability to their X-ray lab, replacing their outdated film radiography process. The HD-CR 35 scanner and DRC 2430 digital detector array (DDA) eliminate the need for manual film developing and chemistry management, and no longer needing a darkroom liberates valuable space.

The flexibility of the new equipment, along with the ease-of-use of DÜRR's D-Tect X software, means that the large group of conservators can more efficiently and quickly perform their investigative tasks and share the resulting images with their peers.



As an example, this CR image of a painting of Susanna Cardwell McCausland (attributed to Joshua Johnson and dated ca. 1805) clearly shows canvas repair as well as

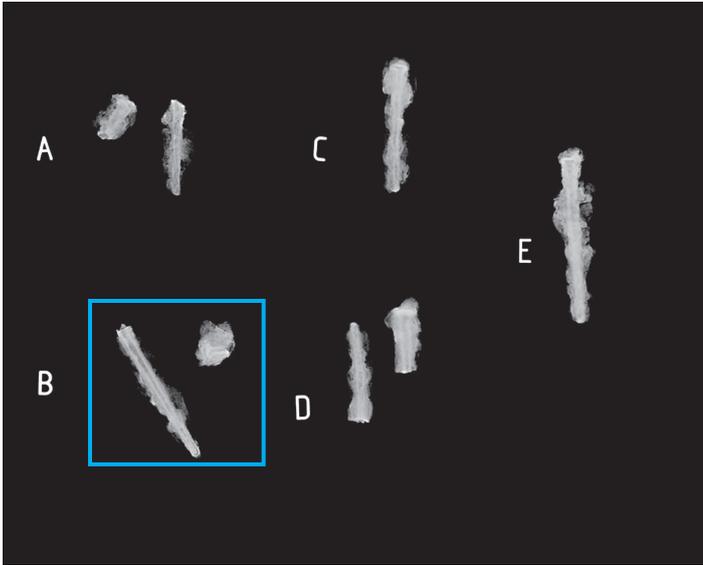
underlying paint lines which provide evidence that the artist has changed his original composition during creation.

Because CR uses thin flexible imaging plates (IPs), it was possible to safely insert the IP between the canvas and the wooden stretcher to eliminate interference from the frame structure while capturing this image.



Another example where CR is the preferred method of image capture is where IP flexibility is important. In this example the IP was placed inside a large glazed ceramic mug (ca. 1815) in order to image one side without interference from the other. The resulting image clearly shows that the vessel has suffered significant damage and has been repaired with metal rivets, indicating that it was highly valued. Because the mug's repairs had been completely painted over, the extent of the damage was only revealed using radiography.

DR, on the other hand, uses a thicker imaging device which is not appropriate for this application, but gives almost instant images so that suitable artifacts can be quickly and easily imaged. In fact, because DR provides real-time imaging capability, it is simple to adjust X-ray parameters on-the-fly to achieve the best possible image before capturing the final version to the software. This is a great advantage in an environment where objects made from very diverse materials



are imaged, as the density and thus the required X-ray settings can change radically from one application to the next.

This DR image of iron nails clearly shows the original nail structure inside the corrosion that has accumulated on the nails over the years. Because the DRC 2430 DDA has industry-leading resolution, it is easy to zoom in to individual nails to examine them more closely, and the D-Tect X software offers sophisticated filters and measurement tools to enhance the images and allow detailed analyses.



The Colonial Williamsburg Foundation now has the tools to quickly and easily advance their investigations, and since the conservators have been trained to use the equipment, each lab has the ability to study their own specialist material.

Patricia Silence, Director of Conservation Operations commented: "Our curators, archaeologists, and other experts who rely on the Colonial Williamsburg Foundation's conservators for expert analysis are really excited to have this technology available. We'll learn much more about our collection now that X-ray imaging is fairly quick, with no mess or use of expensive supplies."

*Colonial Williamsburg*

[www.colonialwilliamsburg.org](http://www.colonialwilliamsburg.org)