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Investigating Production Technology with Neutron Tomography

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Style has played a major role in how archaeologists view material culture. Visual style, over technological style, has often dominated the study of materials due to the destructive nature of many investigative methods. Metallographic investigations, used to analyze metal production technology, are destructive and invasive; they require removing a section of the object. Neutron imaging, on the other hand, provides a non-destructive and non-invasive method of analyzing materials on the basis of production technology. Neutron tomography has been applied to a bronze Roman oinochoe (a wine pouring vessel) to better understand the methods of its production. This allowed for the study of the internal structure of the bronze vessel, revealing the porous nature of the metal. This paper will examine the variability of the porosity within the structure and investigate the methods by which the vessel was constructed. These results will highlight how neutron imaging may provide otherwise inaccessible details of production technology.

This study was performed on the CG-1D prototype neutron imaging beamline at the High Flux Isotope Reactor (HFIR) at Oak Ridge National Laboratory in Tennessee, USA.

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