Investigation of Ancient Central American Metallurgy through Compositional Analyses

Supervisors:

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This project is one of the initial studies developed as a collaboration between the Edith O’Donnell Institute of Art History and the School of Natural Sciences and Mathematics at the University of Texas at Dallas, and the Dallas Museum of Art.

Ceremonial mask
Colombia: Calima river valley
Ilama period, 800–100 B.C.E.
Gold
Dallas Museum of Art, The Nora and John Wise Collection, gift of Mr. and Mrs. Jake L. Hamon, the Eugene McDermott Family, Mr. and Mrs. Algur H. Meadows and the Meadows Foundation, Incorporated, and Mr. and Mrs. John D. Murchison, 1976.W.321.

Project Summary:

The intent of this project is to use compositional and surface analysis to study the manufacturing process, functional use and archaeological life history of largely pre-Hispanic gold-alloy artefacts from the Greater Central America collections at the Dallas Museum of Art. These investigations are directed not only at advancing scholarly research on pre-Hispanic artistic and cultural practices that developed within Greater Central America – a region defined by the modern-day Colombia, Venezuela, Panama and Costa Rica. They are further aimed at enhancing museum best practices for conservation and preservation of these remarkable visual arts.

Metallographic studies of the ancient Americas have utilized various optical and sampling techniques, including XRF and PIXE. Extending from such established research, this project will investigate compositional analyses to understand better specific manufacturing processes, including techniques for surface decoration. A critical component of this study will be assessing comparative material compositions in metal alloy ratios as a function of artisanal selection, as well as depth analyses as they indicate surface enrichment processes. Trace element analyses will be undertaken to determine whether these aspects reflect regional variations. A comprehensive program of chemical and physical analyses will be explored, as well as potentially novel analytical approaches to enrich current understanding about Greater Central American metallurgy.

The project will begin with a detailed survey of conservation literature on the topic of Greater Central American and comparative archaeological metallurgy. Technical analyses will then focus on Greater Central America collections at the DMA, which include over 700 objects spanning 2500 years of cultural history. The collection reflects diverse regional traditions, from early sheet metal ornaments of the Calima River valley to lost-wax cast works of the Muisca, Tairona, Zenú, Coclé, and Veraguas–Gran Chiriquí regions. The objects consist primarily of bodily adornments, from elaborate headdresses, masks, pectorals, and pendants to fine nose and ear ornaments. There is also a significant number of cast offering figures, known as tunjos. Studies of the manufacturing techniques, material composition, and modern condition of these objects will contribute to a deeper understanding about their life histories – from assessing their temporal and geographic origins to their modern museum stewardship.

Resources:

Exploration of existing literature on the topic of Central American metallurgy can be found through AATA Online (Abstracts of International Conservation Literature): http://aata.getty.edu/Home.

Further Information:

For further information and/or to initiate an informal discussion, please contact:
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