Overlooked Organics in Decorative Arts: Cataloging Skin-Based, Skeletal, and Hard Keratinous Animal Tissues

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In 2018 Winterthur Museum, Garden & Library was awarded an NEH grant to catalogue "overlooked organic" objects in the collection through physical identification and analytical research. Before scarcity and synthetic materials supplanted them, natural components sourced from the animal kingdom were plentiful in the decorative arts. These objects, created from hard matrices and collagen-based organics by artists whose craft traditions are scarcely practiced today, are culturally, historically, and artistically important. This project focuses on cataloguing a group of objects with a high standard of accuracy, acquiring information through visual and scientific analysis, research, and expert consultation. The work is a collaboration between curatorial, conservation, and scientific staff to understand findings within the craft context for each object.

The project's main objective is to make the animal organics more accessible through accurate and full catalogue records including creation context, photography, condition information, materials identification, and web descriptions. Where visual identification is inconclusive, peptide mass fingerprinting (PMF) is providing a species identification, to varying degrees of certainty, based upon existing reference data. This technique, which involves MALDI-ToF analysis of enzyme-digested microsamples, required a new set of skills and knowledge from the two Winterthur scientists. An introduction to and continued guidance of the PMF technique and interpretation has been provided by Dr. Dan Kirby, an independent conservation research scientist affiliated with MFA Boston. MALDI-ToF instrumentation is accessed at the University of Delaware's mass spectrometry facility.

While some objects are easily sampled and produce good data to be interpreted by the non expert user, others are more challenging. Shagreen objects are proving especially obtuse. Many historic practices for shagreen include mammal and fish skins, but small or worn objects are difficult to identify visually and to sample. Likewise, species identification through peptide markers, especially for equine or fish references, are often not distinguishable. Challenges related to nuances and limitations of data interpretation continue to be explored. For example, a group of leather pocketbooks sampled had some spectra matching known references and others giving unusual results. And with one netsuke sampled, visual expertise helpfully challenged the data markers for the identification of mastodon versus mammoth ivory.

These collaborative methods cannot yet satisfy all of our curiosity and goals. One limitation is the peptide markers currently in the literature; we need to expand this data to include typical categories. For example, we wish to know more about the species of fish used to create shagreen. The database of markers only has the ability to distinguish "fish," but material culture history is clear that species of ray and shark were used. We are now collaborating with

an expert in rays and sharks to collect a diverse range of samples to add to the PMF database. Keratinaceous materials are documented to a lesser degree through PMF than collagen markers, due to a more involved digestion protocol, but they have a significant presence in the museum's collection. Identification challenges continue for pressed horn versus hoof.

This project is dramatically upgrading our collection documentation, broadening staff expertise, and helping to advance eco-critical studies.