

Introduction:

The work for this REU is to (re)discover the crafting ingenuity and culture that has survived to this day with the Lakota peoples. The research objective is to provide a database pertinent to the Lakota culture and history and develop a versatile process for analyzing Lakota artifacts. The phrase “Native Americans” or “American Indians” refers to the entirety of the 566 federally recognized tribes (“Indian entities recognized,” 2012). To make this project manageable for the duration of a 10-week summer period, the Lakota people, whose reservations are largely within South Dakota, are the focus. The Heritage Center provided three umbilical cord containers for this work [Figures 12 and 13].

Overarching Objective:

To continue developing a versatile database and procedure for fully analyzing Lakota historical objects and art of various mediums. To uphold the Indian Arts and Crafts Act of 1990. To demonstrate that modern technology challenges lost culture.

Quilled Turtle Container

Cultural:

- Umbilical cord container – a set is made at the child’s birth, one is buried [Figure 1]
- Center design – double-woman design, usually used for protection [Figure 4]
- Eagle feather [Figure 3]
- Set of four layers [Figure 2]
- Waist tie – carried throughout childhood

Historical:

- Establishment of reservations
- Introduction of materials to this region
- Museum documents
- Government policies



Figure 2



Figure 3



Figure 4



Figure 5



Figure 1

Physical Analysis:

VSC
High definition camera
UV and IR capabilities

XRF
Spectrum of relative quantities of beamed elements [Figure 6]

Micro CT
Imaging of (enclosed) items for density [Figures 7-11]

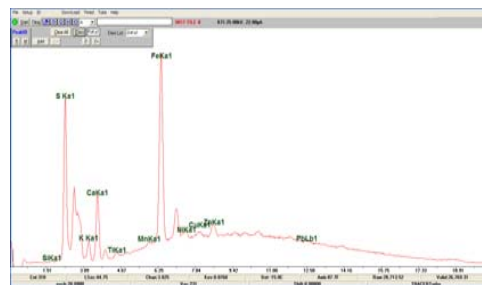


Figure 6

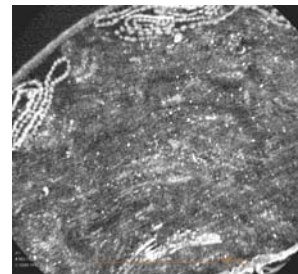


Figure 7

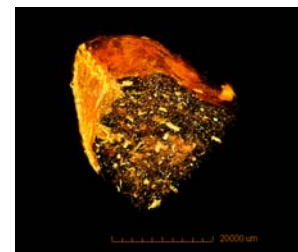


Figure 8

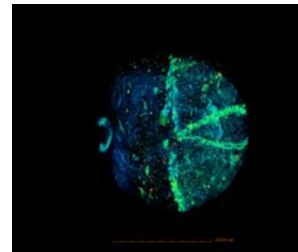


Figure 9

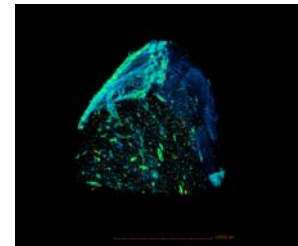


Figure 10

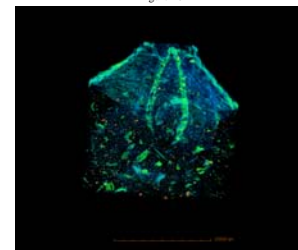


Figure 11

Procedure:

Cultural Understanding:

- Relevant literature and interviews with cultural authorities
- Identifying: designs and symbolism, construction, the spiritual significance, and social constructs, etc.

Historical Understanding:

- Relevant literature and interviews with historical authorities
- Identifying: period-relevant materials, government relations, and museum documents, etc.

Physical Analysis:

Available tools at include VSC, XRF, Micro CT, SEM, and a Raman Spectrometer.

Long Term Goals

Develop relationships with local and broader institutions

- Museums: Heritage Center, Sioux Indian Museum, Crazy Horse Memorial
- Local Stores: Prairie Edge, Tandy Leather, Dakota Drum

Diverse foundation of knowledge

- Materials: Beads, quills, various animal hides, metals, pigment dyes,
- Processes: tanning methods, beadwork and quillwork, approved physical analysis methods,
- Gov. and Social: US relations and policies, European influences, freedom of Native Americans



Figure 12



Figure 13

Future Work:

- Deterioration of hides
- Expanding cultural and historical database
- Reaching out to professional artists for artwork security
- Covert printing

Proof of concept:

Covert printing on imitation feather

Printing on materials for identification security applications include restoring lost/stolen items, protecting professional Native American artisans



Figure 14



Figure 15

Acknowledgements:

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