



Conservation Considerations for Archaeology Collections.

The following discussion is adapted from the SHA Standards and Guidelines for the Curation of Archaeological Collections (1993) and the NPS Museum Handbook, Part I (1996).

Archaeological objects “in situ” have generally reached a state of equilibrium with their environment. Although taphonomic processes, (what happens to an object or organic material after disposal or death), might have altered the object in some manner and erosion and weathering may continue to alter the object, many artifacts are recovered from stable environments. The excavation process disturbs this stability and recommences deterioration. A critical task for any archaeological project is to reestablish equilibrium before total destruction of the object occurs.

Different materials, i.e. glass, metal, ceramics, stone, etc., are subject to different destructive forces and require different preventative measures. Therefore, as mentioned in Chapter 2, it is recommended that archaeologists consult with conservators *before* excavation begins. This allows the archaeologist to become conversant with the types of artifacts that may be encountered, the conditions in which they are found, and preliminary conservation measures. At any time, when difficulties are encountered in the field, consultation with conservators can help in the recovery process. This allows for retention of as much factual information about the artifact as possible (Bourque, et. al. 1980, Storch 1997).

The Table below lists the most common archaeological materials with their associated problems and curatorial requirements. This list is not inclusive and provides guidelines only. The optimal temperature listed varies among the materials. MHS’s storage facilities are kept at 65°(+/- 3% in 24 hours) with 50% relative humidity (+/- 3%), providing an average suitable for most materials. As long as objects are retained in this environment, equilibrium can be reestablished. Objects requiring special considerations will be discussed below. Artifacts that require different humidity levels can be stored in custom made micro-climate containers. Consult the NPS Museum Handbook and the *Storage of Natural History Collections: Ideas and Practical Solutions* (Rose and de Torres 1992) for examples of custom housing.

Special Conservation Issues

1. Bone

Animal bones may be hard and well preserved. They should be kept in a stable environment. Bone that is soft and crumbly may need to be consolidated. Consolidation is a process of chemically stabilizing and adding cohesiveness to the object. This should only be done by a trained conservator. Use proper supports when storing bone.



Human bones are subject to federal guidelines, under the Native American Graves Protection and Repatriation Act (NAGPRA) regulation.

2. *Metals*

Metals are subject to corrosion (rusting, flaking, bronze disease, etc.) and can cause deterioration in other objects through chemical contamination. Metals that appear dry can contain moisture pockets under the exterior rust. This moisture will continue to cause corrosion and breakdown of the base metal. Metals should be stored in separate packages from other objects, and kept in a low humidity environment. When packaging metals, include silica gel packs and check the packs frequently. A trained conservator may be able to completely desiccate the iron and coat with a preservative to stop additional rusting.

3. *Ceramics*

There are several categories of ceramics that are found in archaeological excavations, depending on the firing temperature at the time of manufacture. Non-fired ceramics, such as adobe, mud bricks, dried clay, etc., and ceramics fired below 1000°C (called terracottas), are



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	Material	Characteristics	Associated Problems/Treatment	Environmental Requirements ¹		Storage Requirements
Category 1: Negligibly Climate-Sensitive	Stable Fired Ceramics	hard, dry, little apparent deterioration	Breakage - cushion properly in storage.	Climate: Fluctuations in temperature and humidity should be as gradual as possible.		Store artifacts in Zip-loc type polyethylene bags and house in archival boxes. Label all bags with permanent marker. Do not use: paper bags, foils, staples paperclips or cellophane tape. Silica Gel may be added to storage containers for additional humidity control.
	Stone	“	Weight - place in bottom of storage box.			
	Stable Inorganic Materials (plaster, mud, daub, brick, stone)	“	“	Relative Humidity: Between 30% and 55% - above 55% mold will occur.		
	Dry pollen, inorganics, soil samples	dry, dusty	May need to be double-bagged.	Temperature: Moderate to cooler - below 70°.		
	Faunal Remains	dry	May be fragile. Place near top of box.			
Category 2: Climate Sensitive	Stable metal	dry, no signs of rust	Can be crushed. Cushion properly.	Climate: No fluctuations greater than 3% daily or 10% annually		Same as above. Use special micro-climate housing adapted on case-by-case basis. See NPS Museum Handbook and <i>Storage of Natural History Collections: Ideas and Practical Solutions</i> (Rose and de Torres 1992) for examples.
	Stable glass	dry, no sign of deterioration	Breakage. Cushion properly.			
	Worked bone, antler, shell	dry	Weight. Heavy items in good condition should be placed in bottom of box. Fragile items cushion properly.	RH: 40-50% Temperature: Between 50° and 70°F no fluctuations greater than 5° daily.		
	Botanicals	“	“			
	Textiles	“	May be fragile. Store separately. See <i>Conservation Notes</i> for proper techniques.	RH: 40-50% Temperature: Between 50° and 70°F no fluctuations greater than 5° daily.		
	Wood	dry or preserved	Weight. Place in bottom of box.			
	Skin, leather, fur	“	May be fragile. Store separately. See <i>Conservation Notes</i> for proper techniques.	RH: 40-50% Temperature: Between 50° and 70°F no fluctuations greater than 5° daily.		
	Feathers and Horn	“	“			
	Natural gums, resins and lacquer	Cracking, flaking, peeling, melting, separation from object	Do not store near heat. Do not use solvents.			
Category 3: Significantly Climate-Sensitive	Unstable (salt-contaminated) ceramics and stone	Friable	Disintegrates easily. Minimal handling. Possible removal of salts by conservator.	RH: Below 50%	Temperature: 60-72°, no more than 2-3° fluctuation.	
	Unstable glass	Weeping - Devitrified -	Salts/chemicals in glass attract water - keep in low humidity. Acid imbalance in formula, glass dries out/flakes.	RH: 30-40%		
	Unstable metal, particularly iron	Rusted, flaking	Continued oxidation - low humidity, possible preservative.	RH: Under 30% Iron under 15%		

¹ Light (UV Radiation): Light levels should not exceed 150 lux (15 foot-candles). Light sources should be filtered for UV radiation.



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Mummified human and animal remains	Could be friable, fragile	Subject to mold - (depends on case - maintain as close to original environment as possible)	RH: 20-30%	Consult with a conservator before excavation.
Composite objects	Varies	Varies	Determine on a case-by-case basis.	
Wet or waterlogged organics	Water-saturated	Possible salt contamination. Improper drying will result in cracking, peeling, disintegration.	Consult with conservator before excavation.	

Table 1: Material curation. Adapted from SHA and NPS.



most at risk in archaeological settings. These ceramics are often unstable and heavily weathered, and are usually found at prehistoric sites. Ceramics fired at temperatures above 1000°C, earthenwares, stonewares, and chinas, are more durable. These types of ceramics are more often found in historic sites (Storch 1986).

Ceramics are easily broken, chipped and cracked. Salts, both soluble and insoluble, may permeate the ceramics due to the porosity of the clay. Reconstruction of vessels and salt removal should be done by a conservator. Special housing should be constructed for reconstructed vessels. Ceramics should be carefully cushioned in storage to prevent further breakage.

4. Organic Materials.

Organic material such as textiles, leathers, fur, feathers and basketry are usually extremely fragile. These objects should be placed in specially constructed housing. Many objects may need conservation and each must be considered individually for proper care.

5. Wet or Waterlogged Objects.

Underwater archaeology or the recovery of artifacts found in an extremely wet environments are subject to special conditions and can rapidly deteriorate. It is suggested that before any artifacts are excavated from these environments, a conservator or specialist is consulted for proper procedures to prevent the loss of valuable archaeological data.

6. Conservation Treatment.

Any conservation treatment of objects prior to accession by MHS must be fully documented. Copies of all conservation treatment documentation must accompany the collection documentation.

MHS has several conservation laboratories, such as Paper Conservation, 3-D Objects Conservation, Textiles Conservation, etc. Most archaeological objects are three-dimensional, requiring special preservation techniques depending on the condition of the object and the environment in which it was found. Any objects that are accessioned by MHS, that are found in need of conservation, will be sent to the appropriate conservation laboratory. A Treatment Request Form (Appendix E, page E-5) must be filled out and accompany the object. After treatment, the object is returned to collections storage and adjustments made for any new storage requirements of the objects. Copies of all records of conservation treatments will be kept with the collection documentation.