

# The conservation and Restoration in Archaeology

**Título:** The conservation and Restoration in Archaeology. **Target:** Bachillerato de humanidades. **Asignatura:** arqueología, Historia, restauración y conservación. **Autor:** María Belén Fernandez Carvajal, Licenciado en Geografía e Historia/ Conservación y restauración de Obras de Artes, profesor de Plástica y Visual en Educación Secundaria.

## 1. INTRODUCTION

Gradually Archaeologists are aware of the importance of extracting the objects buried in good condition so that the information contained there should not perish, and minimize treatment performed later by restorers in a laboratory.

Therefore, it is important to plan conservation actions and seek a balance between conservation and restoration. All the Interventions will be minimum, reversible and safe.



## 2. THE DIFFERENCE BETWEEN CONSERVATION AND RESTORATION

### CONSERVATION

The Conservation is the action that aims to maintain the security and integrity of cultural property and minimize damage in order to prolong its existence. Its main objective is to avoid or minimize future damage or future losses. These measures and actions are indirect and do not change the appearance of the object.



“in situ”



In the museum

### BURIED OBJECT

Any object that is buried remains in a different environment for which it was created and then under goes a process of transformation. The type of soil in which the materials have been buried determines alteration process. Each floor has its own characteristics, marked by the distribution and content of organic and inorganic matter under the action of a given climate.

- New mechanical condition
- Loss of immobilization, handling
- New physical conditions.
- Exposure to light, temperature, humidity variation.
- Chemical pollution.
- Microflora, microorganisms, insects, animal droppings, etc.

This table lists the conditions to which they are subjected archaeological materials (underground environment and after excavation).

<u>Underground environment</u>	<u>Post-excavation Environment</u>	<u>Deteriorating effects</u>
RH (relative humidity) stable	Variable HR	HR high level favors attack by microorganisms
		Medium-high level of HR promotes corrosion (Fe and Cu)
		Medium-low.
		Low. It may harm organic materials
T <sup>a</sup> (temperature) very stable	Highest temp fluctuating	The increased of T <sup>a</sup> accelerates the chemical alterations. Microorganisms appear
Limited entry of air	Air to contain oxygen (CO <sub>2</sub> , SO <sub>2</sub> and other acid gases)	Increases all forms of deterioration (biological and chemical)
Absence of light	Presence of light	favors the action of microorganisms organic materials. It can activate the oxidation
Salt content	sales + HR	penetrate the soluble salts penetrate in porous materials and if low the HR they crystallize (fractures)
Presence of organisms	Presence of organisms + temperature + light	It accelerates its activity. It can cause acid attacks on the objects

#### MINIMUM PRACTICAL INTERVENTIONS IN THE FIELD

It is important to work on site with appropriate tools and materials (brushes, chemicals, consolidating, bamboo sticks or wooden utensils to avoid scratching the surface, scalpels, etc).



## METHODOLOGY FOR THE CONSERVATION OF ARCHAEOLOGICAL SITE MATERIALS

The conservation status of the material is determined by several variables related to the environment in which they find themselves and the intrinsic characteristics of the pieces.

### POTTERY

1. Using hydrophilic bandages with some consolidating: for fragments or whole pieces but empty, lightweight, consolidation is performed with hydrophilic and bandages with Paraloid B72 diluted at different ratios
2. Application by impregnation consolidating direct: The consolidating may be: Paraloid B 72 to 5%.
3. Extractions of whole material with a layer of transparent polyethylene plastic reinforcement tape: If the pieces are small and lightweight, and the state of preservation is not bad, is used to wrap polyethylene film, going after different tapes reinforced with cellulose.
4. The use of rigid beds: For the extraction of objects of great weight and size. You can use polyurethane, plaster or polyester.
5. Combined Methods: Using multiple extraction systems on a same piece



Once extracted objects are well packaged and is necessary to maintain controlled environmental conditions. It is recommended to pick up the pieces when not cleaning the land that is in direct contact with the surface, as their protective and easier and safe to remove these deposits in the laboratory.

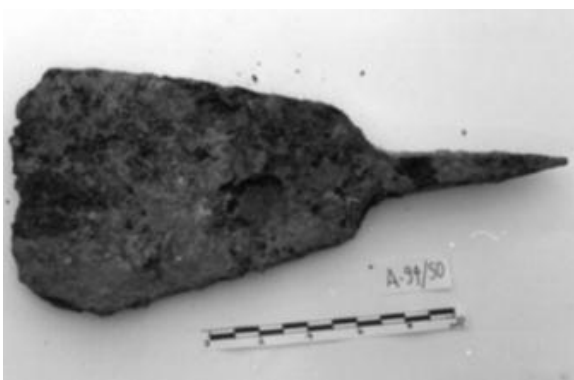


## THE METAL

The metal is a rare commodity in an excavation and often their small size (usually jewelry, nails or tools of work) were easy at the time of extraction in an excavation.

Except for gold, metals are continuously changing materials. Usually corroded and this can be of two types:

- Corrosion dry, which is produced without the presence of water sufficient to high relative humidity occur. Only affects the surface of the object.
- Electrochemical corrosion. Produced in the presence of water, there is a profound transformation at the expense of the material itself.



If materials are delicate, we can protect the metal piece with plastic wrap to prevent contact with plaster bandages applied in all the piece and would work as a rigid bed for the extraction and transport.

The packaging materials recommended for metal objects are: tissue paper free of acid and polyethylene to the absorption of impacts

### **BONE MATERIAL**

The state of the environmental conditions of buried objects causes a rapid deterioration of these materials. The Phenomena of altered bone itself and ivory are associated with their chemical composition and physical properties and environmental conditions in which they were. The deterioration of bone material depends on the type of soil: too wet medium produce decomposition of organic matter.



The most important changes are:

- High humidity levels.
- Environmental Dry.
- The direct sunlight.
- The movements and pressures land.
- Plants and roots can also cause cracks and fissures in the bones.
- Manipulations to suffer the piece as well as deficiencies in transport, irreversible interventions, etc.



### **WOOD**

The process of altering the wood will always be associated with the environmental conditions in which remained buried. The materials may be subjected to a process of chemical, physical, biological or structural change.

- Artifacts of rare wood instead survive (they do in flooded areas or under water, where the absence of oxygen inhibits microbiological attack).





Mazarrón I Phoenician boat (S-VII BC -Cartagena/ Murcia (Spain))

## GLASS

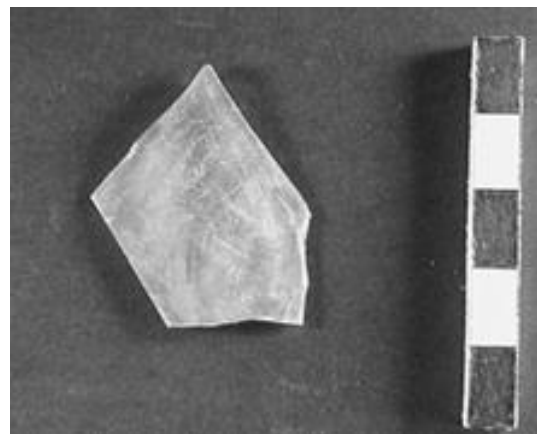
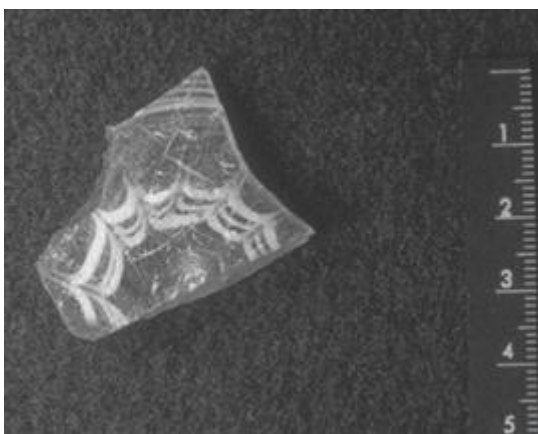
The alteration of these materials depends on the composition, making techniques and burial conditions.

Types of changes:

- Mechanical disturbance due to their fragility.
- Chemical alteration: the most frequent is the devitrification is (iridescence arising causing the loss of the material).

The appearance of a glass can be altered:

- Clear: glass loses transparency
- Exudate: we can see drops of liquid on the surface.
- Cracked: presence of microcracks that make the glass opaque.
- Staining: presence of iron oxides or sulfates of lead, (blackish)
- Iridescent: symptom of a disturbance severe, results of devitrification



Glass objects should not be washing, because of its fragility is likely to have to take them out with the land and apply consolidant.

## Restoration

This acts on the part directly and its main objective is to stop the processes of alteration or reinforce the structure of the object. These actions are performed only when the goods are badly damaged. The Restoration at times changes the appearance of objects.

The restored work must submit the following principles:

1. Respect the original
2. Minimal intervention: what is strictly necessary. The less handling will suffer durability
3. Discoverable: The reinstatements must be visible to the public
4. Imaging Unit: The reinstatements must be recognizable.
5. Reversibility: The restorations can be easily removed.
6. Register: Register of observed phenomena and the procedures used.

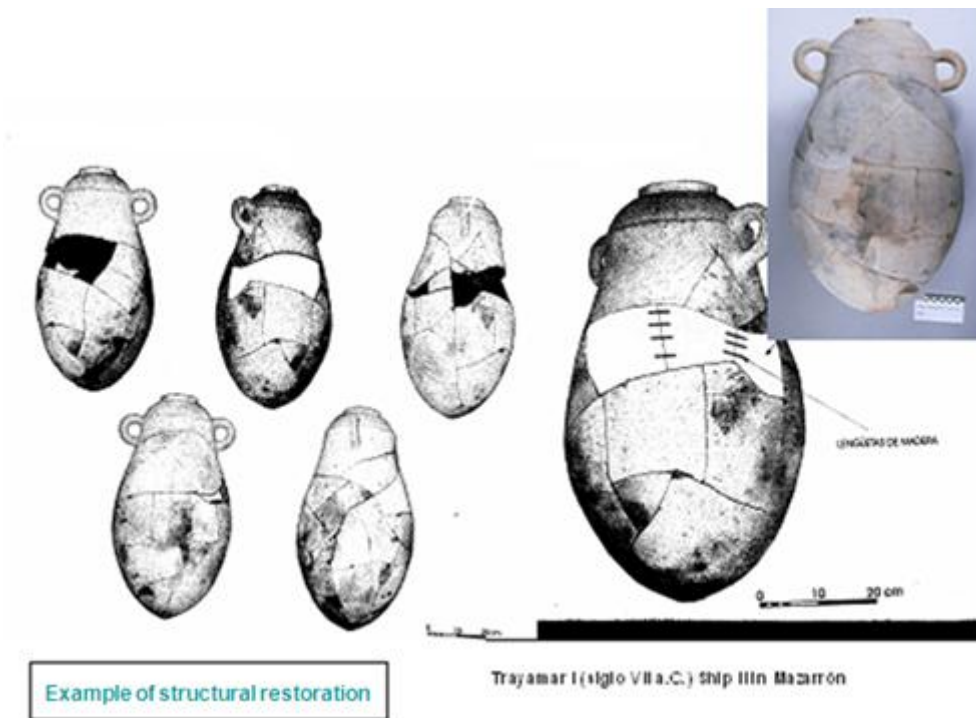


Obviously the type of intervention and the products used will be different depending on the material (organic-inorganic materials), condition, deterioration, etc.

### PHASES OF RESTORATION IN THE LABORATORY:

1. Graphically documenting all processes.
2. Elimination of concretions, dirt-cleaning (mechanical or chemical)
3. Desalination for removal of chlorides through fresh water shower (materials from the marine environment).
4. Acid Neutralizing

5. Consolidation of the fragments
6. Accession of the fragments
7. Structural and pictorial reintegration



Process of restoring a Phoenician amphora from the wreck discovered in Cartagena-Murcia

- 8-Protection
- 9-Production of a final report.

### 3. CONCLUSION

The methodology must be present in the archaeological fieldwork and archaeological objects if not follow the steps correctly in the excavation, recording and extraction, they will be decontextualized losing its scientific value. Moreover, the methodology of preventive conservation and restoration gives us a powerful tool for better removal of material impairment, and also imposes a number of methodological rules that should never be forgotten (minimal intervention, reversibility, documenting all processes and a good understanding of the "tools" of restoration). ●



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