

# Survey on Excavation Methods and Conservation Treatment of Waterlogged Archaeological Leather Artefacts in Central Europe

## The Survey's Aims and Method

In the course of archaeological excavations vast amounts of organic artefacts sometimes emerge unexpectedly. Typical provenances are water-saturated or underwater sites in coastal regions, but also inland waters and moorlands. These materials are in a worse condition and the recovery and lifting from the protective ground increases degradation processes rapidly. Due to lack of resources (staff, equipment, time), excavation teams cannot always provide adequate first aid measures. In addition, leather artefacts are rarely discovered isolated, they occur very often as bundles or large bulks. These request completely different work-flows regarding documentation, packing and transport.

Various guidelines describe the procedure for approaching damp or waterlogged organic artefacts. The most important in post-excavation are stable storage conditions, like packing in airtight boxes or bags to avoid cellular breakdown by desiccation. Cold storage is obligatory. The recruitment of a conservator is mostly suggested. Common conservation methods for waterlogged artefacts include a pre-treatment with polyethylene glycol following by vacuum freeze-drying. However, some institutions do not have technical equipment available for the freeze-drying, using instead controlled air-drying. The survey aimed to assess how institutions in Germany and Europe handle vast bundles of leather from wetlands. The questionnaire covered the structure of the institutions, excavation procedures, supply chains, documentation and conservation methods.



Fig. 1: Waterlogged archaeological leather fragments from Rammelsberg, Harz, Lower Saxony. ©NLD



Fig. 2: Desiccated and contaminated leather fragments. ©NLD

## Implementation and Results

German institutions were contacted by email and also by telephone to maximize the participation. Around 50 foreign institutions and selected museums were invited to fill out a shorter version of the questionnaire via the web portal *surveymonkey*. The time of implementation was February till March 2019. The response rate was about 19% in total (Germany: ~50%, abroad: <10%). It was noteworthy that most of the participating institutions had a vacuum freeze-dryer.

Nevertheless, it is possible to determine that many problems are based on the immense amount of recovered waterlogged leather fragments. Many conservation laboratories receive leather finds more than 3 times per year, often bulks. (Fig. 3) They come wrapped and stored in wet condition, so on-site drying is not common. It is often not possible to treat all finds immediately after recovery. More than half of the depots and cold storages accommodate a queue of objects. (Fig. 4) 42% of the institutions have separated workspaces for organics, 33% are planning an expansion while others admit a lack of space. Due to the vast amounts of material more than 50% of the respondents work with standardised methods. Just a small part has resources for preliminary studies and trials. Nearly 60% stabilize the waterlogged leather by PEG-impregnation and dries it by vacuum-freeze drying. Two-thirds of these apply a pre-treatment with a sequestrant. Some institutions report positive experience with air-drying methods or use alternative techniques. (Fig. 5) It is also significant that many of the participants hold the opinion that leather artefacts are representable in contextual exhibitions even if the aesthetic value is slight.

## Résumé

It is necessary to mention how important transparency and scientific exchange are. Deficiencies should not be disguised because most of the institutions are faced with the same challenges and could support each other by sharing their knowledge, experience and difficulties. The majority works with approved methods, but suffers under the vast amounts of finds. In comparison with the conservation of inorganics like metals and ceramics, organic is a young research domain. For example the usage of sequestrants for cleaning should be more examined, because of occasional changes in the leather's properties. All in all, experts should develop viable and mass-adaptable methods and publish their results.

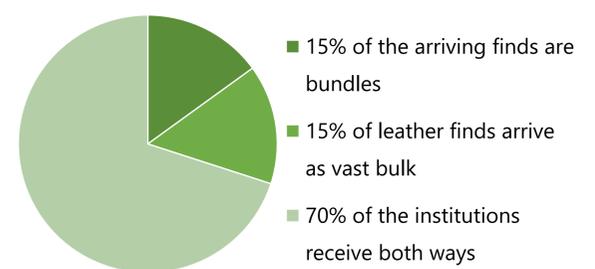


Fig. 3: It is not possible to anticipate how often and to what extend find complexes will arrive in the laboratory.

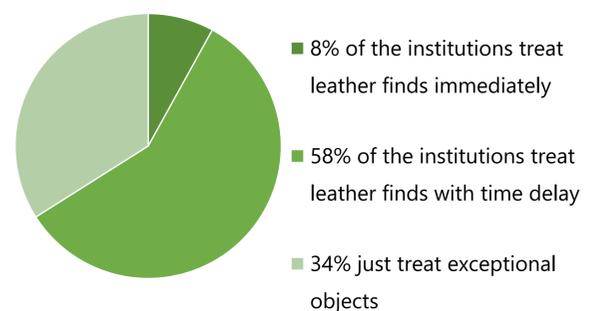


Fig. 4: It is also not possible to provide conservational treatment for all finds

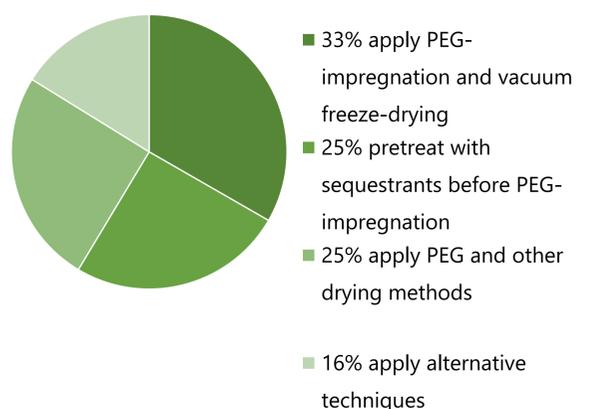


Fig. 5: PEG-impregnation was the most common method.

## Sources

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