

Unfreezing History

A study to find conservational possibilities for the earliest example of a Neolithic bow case ever to be found.

Project: Unfreezing History (<http://p3.snf.ch/Project-159662>; Prof. Dr. Albert Hafner, Dr. Giovanna di Pietro).

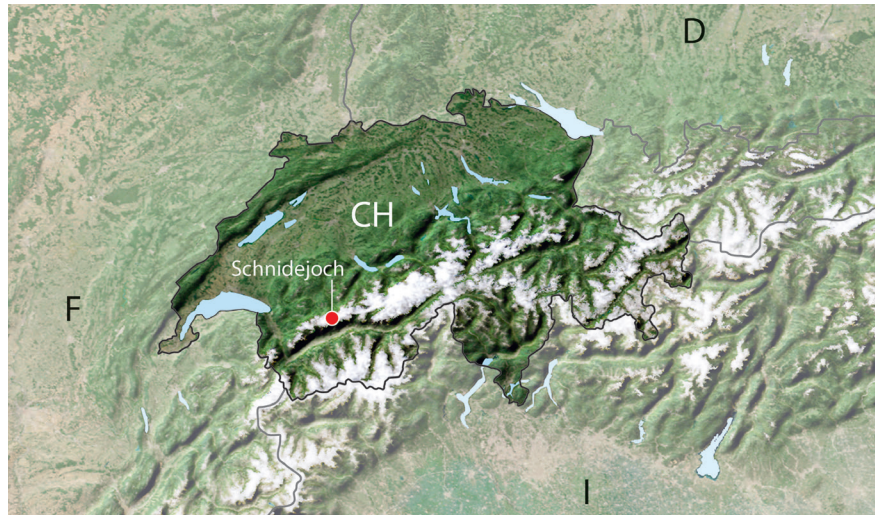
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Introduction

The PhD work is inserted in a 3-years Swiss National Science Foundation funded research project that focuses on an outstanding archaeological object: the unique example of a birch bark bow case. The Neolithic object, dating from around 2800 B.C., was found between 2003 and 2005 protruding from a melting ice patch at the Schnidejoch Pass in the Bernese Alps. It is an archaeological object of outstanding value, since it is the only existing bow case from prehistoric Europe and it is the only Neolithic birch bark container to be built in this way.

The bow case poses two major challenges: firstly, it is unique and can therefore only be inserted into the archaeological context by comparing it with later dated bow cases; secondly, it is an archaeological object made of a material whose degradation process is as yet unknown and it is unclear how it should be preserved.

The conservational part of the research project consequently aims to define long-term conservation strategies for the Neolithic bow case. Currently the body of the bow case is stored in a freezer at -26 °C. Conservation measures must be undertaken to convert the perishable, damp artefact into a stable object, able to sustain ambient conditions. However, birch bark, is a material whose degradation process is yet unknown and it is unclear how the bow case should be preserved. The focus of the PhD study is to acquire a complete overview of the degradation paths of archaeological birch bark and to assess experiences on the conservation of archaeological birch bark objects. This will provide the knowledge that is needed to ensure the long-term preservation of the bow case and accessibility of the object for both to researchers and to the open public.



The Schnidejoch is a pass at an altitude of 2756 m a.s.l. in the Wildhorn region of the western Bernese Alps (46°22'09.10" N, 7°23'19.70" E). Here in 2003 hikers accidentally discovered the first fragment of the bow-case. Karte ADB.



Neolithic birch bark bow case from the Schnidejoch Pass. Foto ADB.

Methods

A complete 3D model based on CT images and structured-light 3D scanning will be produced to understand the inner construction and the possible manufacturing process. Furthermore it will be investigated why birch bark was used, rather than other materials, by taking permeability and water content measurements.

Previous experiences of applying conservation measures established for waterlogged wooden objects to ice-logged birch bark objects have led to major failures. This gap in knowledge will be filled by investigating the type and extent of degradation of the birch bark cells with LM, ESEM and TEM images. The discrepancies between birch bark kept in ice and waterlogged wood will be analysed with water content measurements below zero degrees. This will allow us to estimate the risks associated with a freeze-drying procedure which will be monitored on samples with a freeze-drying light microscope.

The knowledge gained in this project will have an impact on strategies to minimize the risks connected with the storage and treatment of organic objects stored in ice.

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