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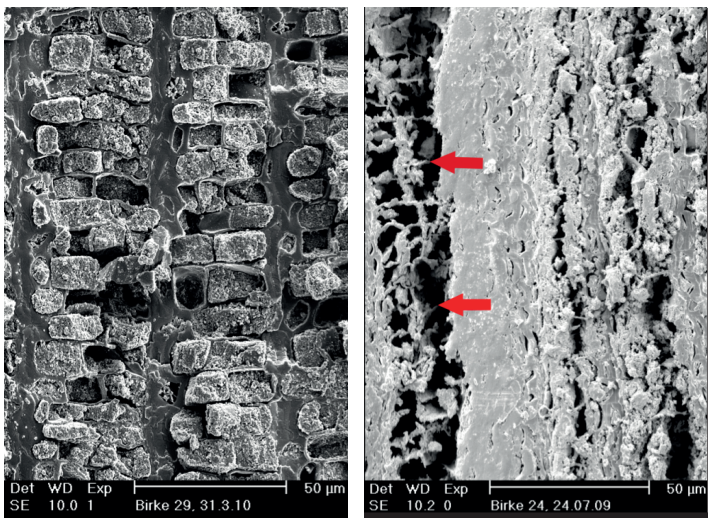
The Schnidejoch is a pass at an altitude of 2756m in the Wildhorn region of the western Bernese Alps (46°22'09.10" N, 7°23'19.70" E). It was here that hikers discovered the bow case in 2003. (Image: Johanna Klügl)



Left: Bow case, lower part, cross section (SEM) showing intact cell walls, no signs of deterioration visible. (Image: Johanna Klügl)
Right: Bow case, upper part, cross section (SEM), thin cell walls (less or non-suberized) are extensively degraded and almost completely lost. (Image: Johanna Klügl)

Neolithic birch bark bow case from the Schnidejoch Pass. (Image: Johanna Klügl)

Research Area Materiality in Art and Culture

Unfreezing history – A study to find historical, techno-logical and conservational possibilities for the earliest example of a Neolithic bow case ever to be found

Abstract: This is an interdisciplinary project bringing together conservators and archaeologists. Its focus is on an object of outstanding archaeological value: a Neolithic bow case found in 2003 in an ice patch at the Schnidejoch Pass in the Bernese Alps in Switzerland. This is the only Neolithic bow case ever found and forces us to a radical shift in our view of Neolithic hunters. This object poses major challenges both for archaeologists and conservators, because there are no similar contemporary objects with which it might be compared. Furthermore, the Schnidejoch bow case was made of birch bark, a material whose degradation pattern is hitherto unascertained for such time periods, so we cannot predict the effect that conservation measures might have on it.

Introduction: This project aims to define long-term conservation strategies for this unique Neolithic bow case and to shed light on its historical significance by investigating how it was manufactured and used. This bow case dates from ca 2800 BC and was found in 2003, protruding from an ice patch at the Schnidejoch Pass in the Bernese Alps in Switzerland. It is an archaeological object of outstanding value, since it is the only extant bow case from prehistoric Europe and the only extant Neolithic birch bark container to have been constructed in this way. The Schnidejoch bow case poses two major challenges: first, it is unique and can therefore only be considered in its archaeological context by comparing it with later dated bow cases. Secondly, it is an archaeological object made of a material whose degradation process remains as yet unknown, so it is unclear how it should be preserved. Our project is situated at the intersection between archaeology and the science of conservation of archaeological objects. We will define what values the two disciplines have in common so that we might set priorities for the immediate and long-term preservation of the bow case, and will collaborate in order to understand its technology.

Methods: We propose making a complete 3D model based on CT images and structured-light 3D scanning in order to understand the inner construction and the possible manufacturing process of the case. We will also take permeability and water content measurements to investigate why birch bark was used instead of other materials. To get more information about its function and to examine the hypothesis that it was a common piece of equipment in the Neolithic era, we propose to compare the bow case with Neolithic quivers and with later cases. Finally, we will carry out experiments on reconstructed replicas in order to test its use.
Conservation measures established for waterlogged wooden objects have in the past been unsuccessfully applied to ice-logged birch bark objects. We will fill our knowledge gap by investigating the type and extent of degradation of the birch bark cells with ESEM and SEM images. The discrepancies between birch bark kept in ice and waterlogged wood will be analysed with novel 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 effectiveness and risks of local consolidation will be assessed.
The knowledge gained here will have an impact on strategies to minimize the risks connected with the storage and treatment of organic objects stored in ice. The intensive study of the construction of the Schnidejoch bow case will give new insights into prehistoric bow equipment, while the comparative analysis of ethnographic materials from historical bow hunters will advance our understanding of the technology, use and maintenance of one of the earliest weapons of mankind.

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