

# Prehistoric expansion of animal husbandry and environmental changes in the Northern Alps - An integrated palaeoenvironmental and archaeological approach

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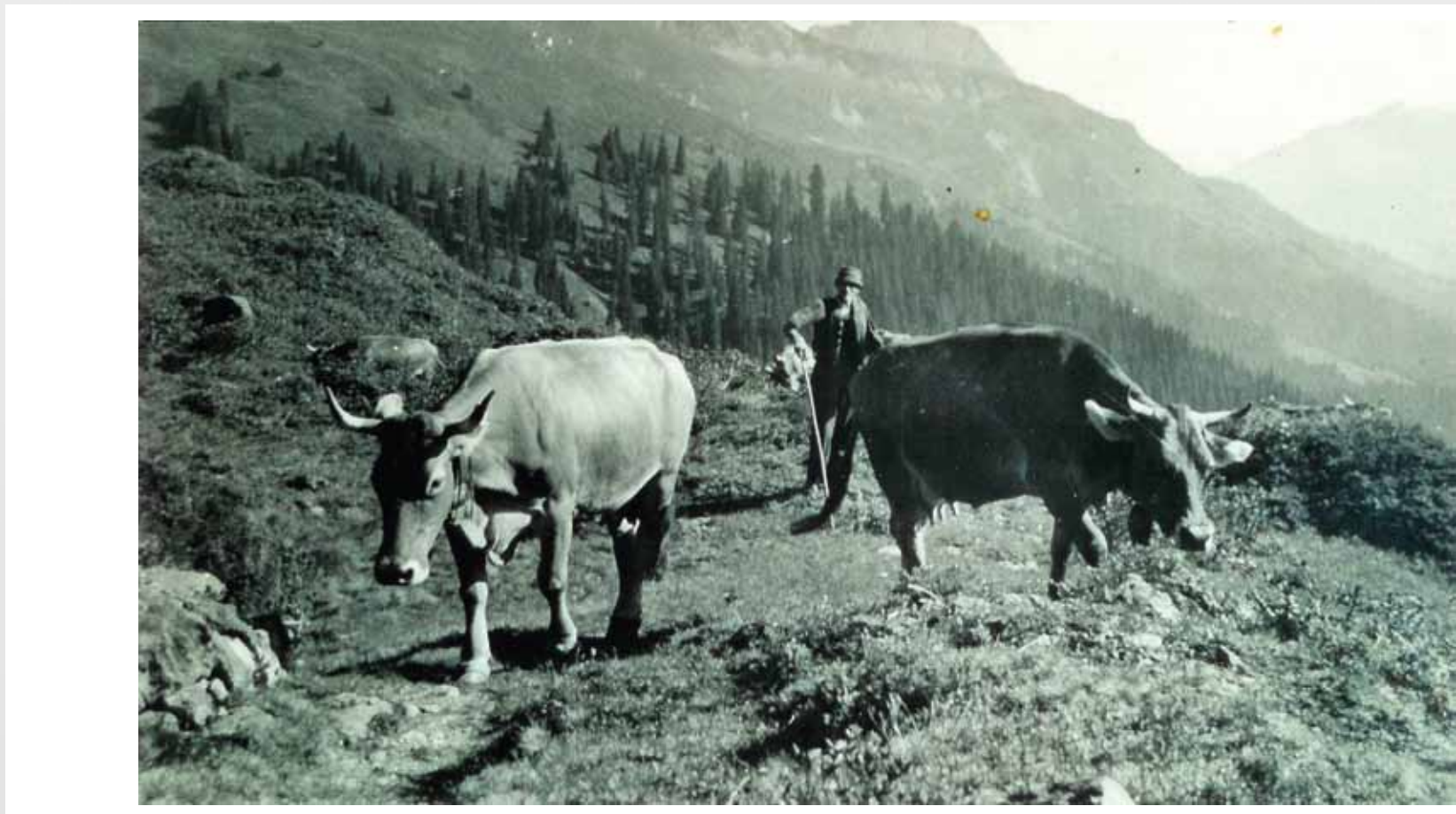
## Introduction

Alpine animal husbandry (Alpwirtschaft) is known to be an important economic factor in the Alps since the Middle Ages. Archaeobotanical, geoarchaeological and archaeological investigations suggest that even in the climatically unfavourable high mountain regions of the Northern Alps agro-pastoral activity played an important role since the Early Bronze Age.

Three sites at different altitudes in Bartholomäberg, St. Antönien and Gargellen (Table 1) have been selected to reconstruct the settlement- and land-use history in the border region of the Northern and the Central Alps. We focus on different land-use activities such as fire induced clearances, pasturing and mining and their impact on the landscape.

To receive more detailed information on different temporal and spatial scales, the more regional land-use and fire history inferred from peat bogs will be compared with local evidence in the soils. Furthermore, the comparison of the results should offer the opportunity to detect a general regional trend or independent developments.

Fig. 1: Alpe Gargälla um 1950 © Fotoarchiv Juen.



## Study site

The Montafon Valley and the High Valley of St. Antönien are enclosed within the mountain ridges of Verwall, Silvretta and Rätikon. The geology is complex because the Helvetic zone and the pennic and austroalpine nappes meet in this region.

The present subalpine vegetation is dominated by spruce and pine forest with meadows and pastures (Waldegger 2005). The potential timberline is situated at approximately 2100-2300m a.s.l. Natural alpine grasslands are rare.

The subalpine is mainly followed by scree slopes and bare rock. Under spruce forest and rhododendron the soil type polygenic podzol has been developed whereas under pasture colluviosols dominate, which can be often subdivided by charcoal layers (Röpke & Krause 2013, Röpke et al. 2011).

Table 1: Main characteristics of the study sites.

Sites	Bartholomäberg Austria	St. Antönien Switzerland	Schafberg (Gargellen) Austria
Altitudes (m a.s.l.)	900-2000	1400 – 3000	2000 - 3000
Annual mean temp (°C)	7.4	5.1	5.1
Precipitation (mm/y)	1200	1400	1400
Geology	Crystalline (mica shist, gneiss), sand- and limestone	Crystalline, limestone, flysch	Crystalline

## Projects and disciplines

Table 2: Involved scientists and institutes.

Sites	Bartholomäberg Austria	St. Antönien Switzerland	Schafberg (Gargellen) Austria
Palaeoecology	Prof. Dr. K. Oeggl and his team (Innsbruck University, Austria)	Dr. A. Röpke (Goethe University Frankfurt, Germany)	Dr. A. J. Kalis, Dr. A. Röpke, Dr. A. Stobbe, L. Bringemeier (Goethe University Frankfurt, Germany)
Geoarchaeology	Dr. A. Röpke (Goethe University Frankfurt, Germany)		
Archaeology	Prof. Dr. R. Krause (Goethe University Frankfurt, Germany)	Dr. J. Rageth (Chur, Switzerland)	Prof. Dr. R. Krause, L. Bringemeier (Goethe University Frankfurt, Germany)

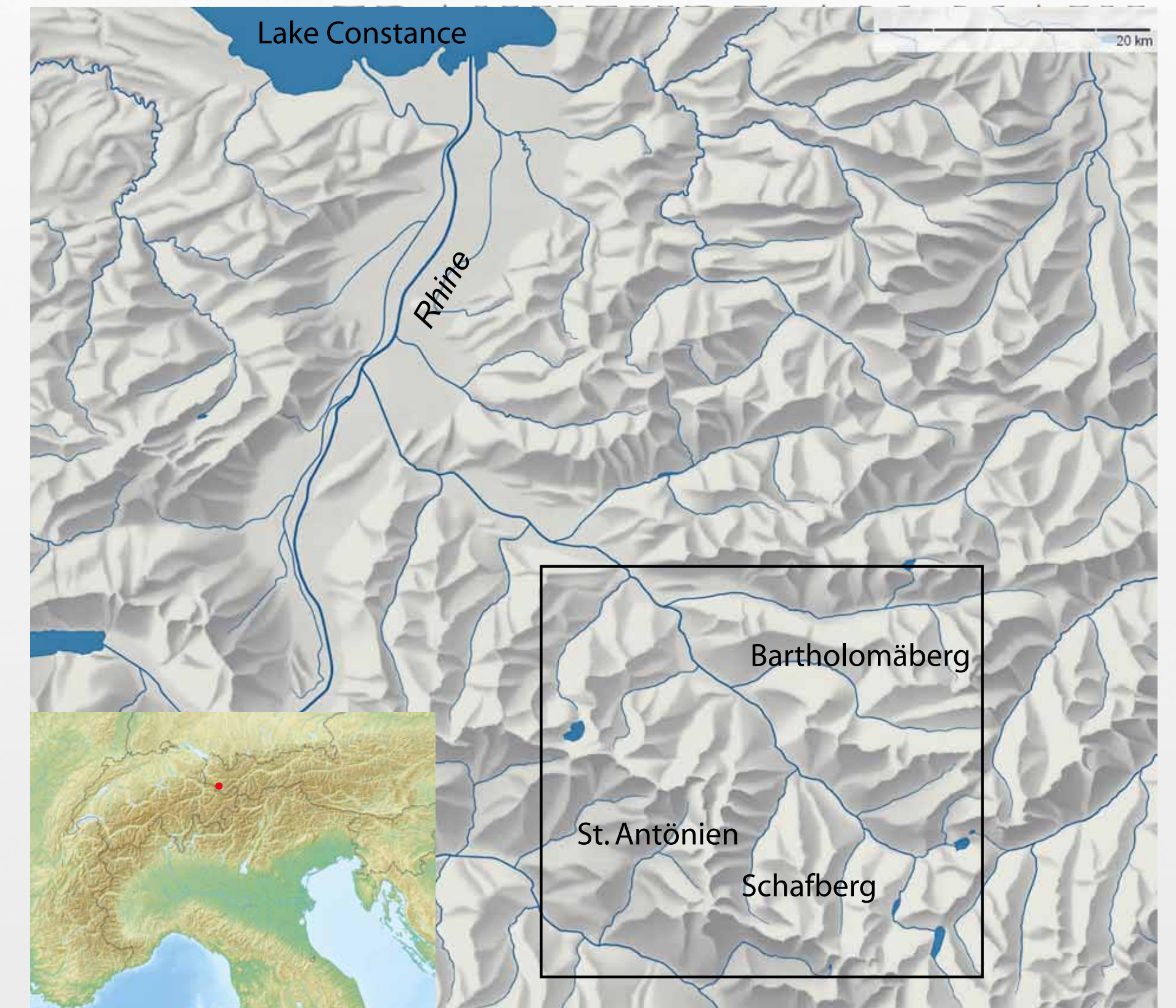


Fig. 2: Map of the study region in the Northern Alps.



Fig. 3: Coring at the Schafberg/Gargellen.

## Results

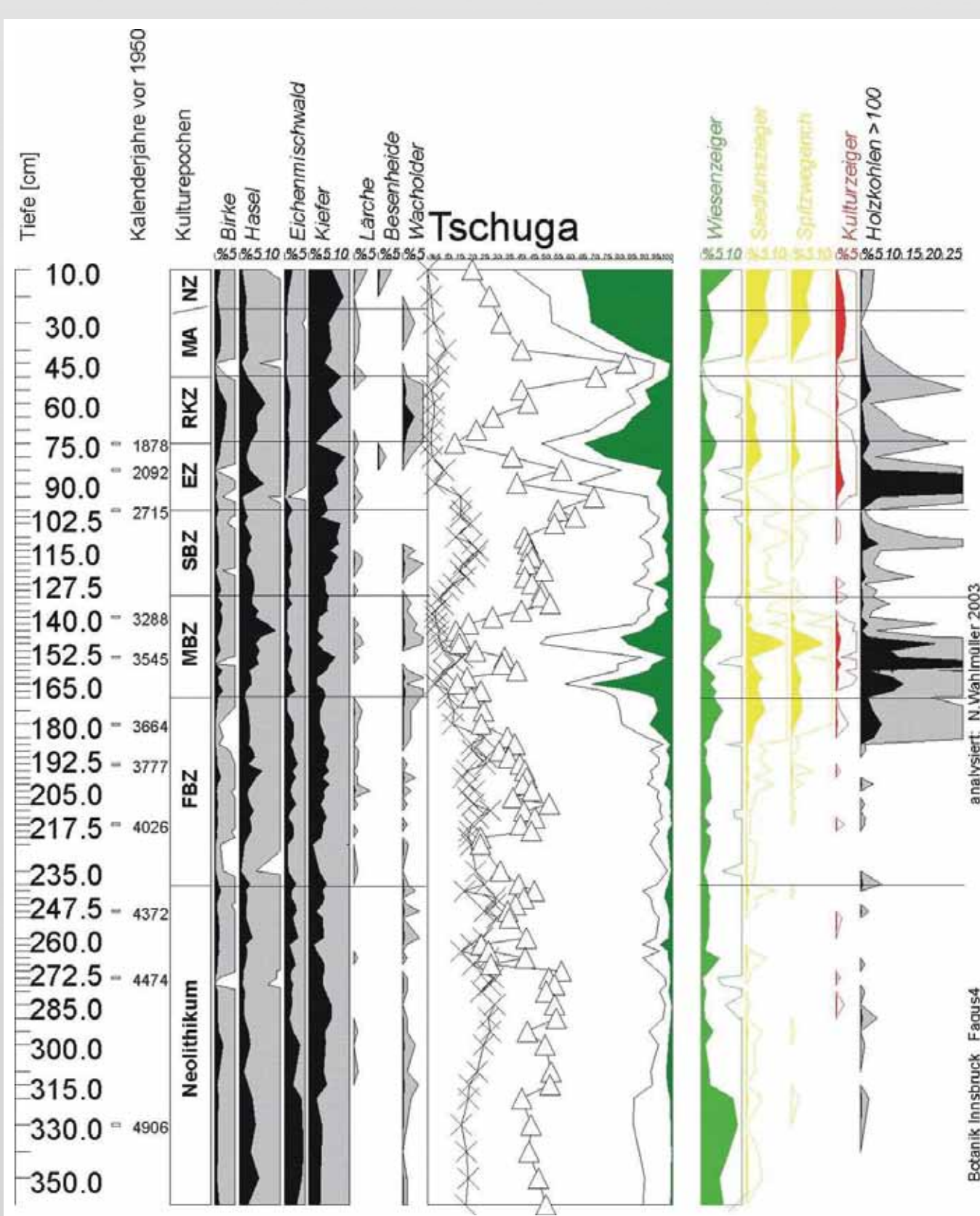


Fig. 4: Simplified pollen percentage diagram of peat bog Tschuga (Bartholomäberg, A).

Fig. 5 & 6: Pollen percentage and influx diagram of peat bog Gross Ried (St. Antönien, CH), Pollen percentage diagram of peat bog Madrisablick 2 (Schafberg/Gargellen, A).

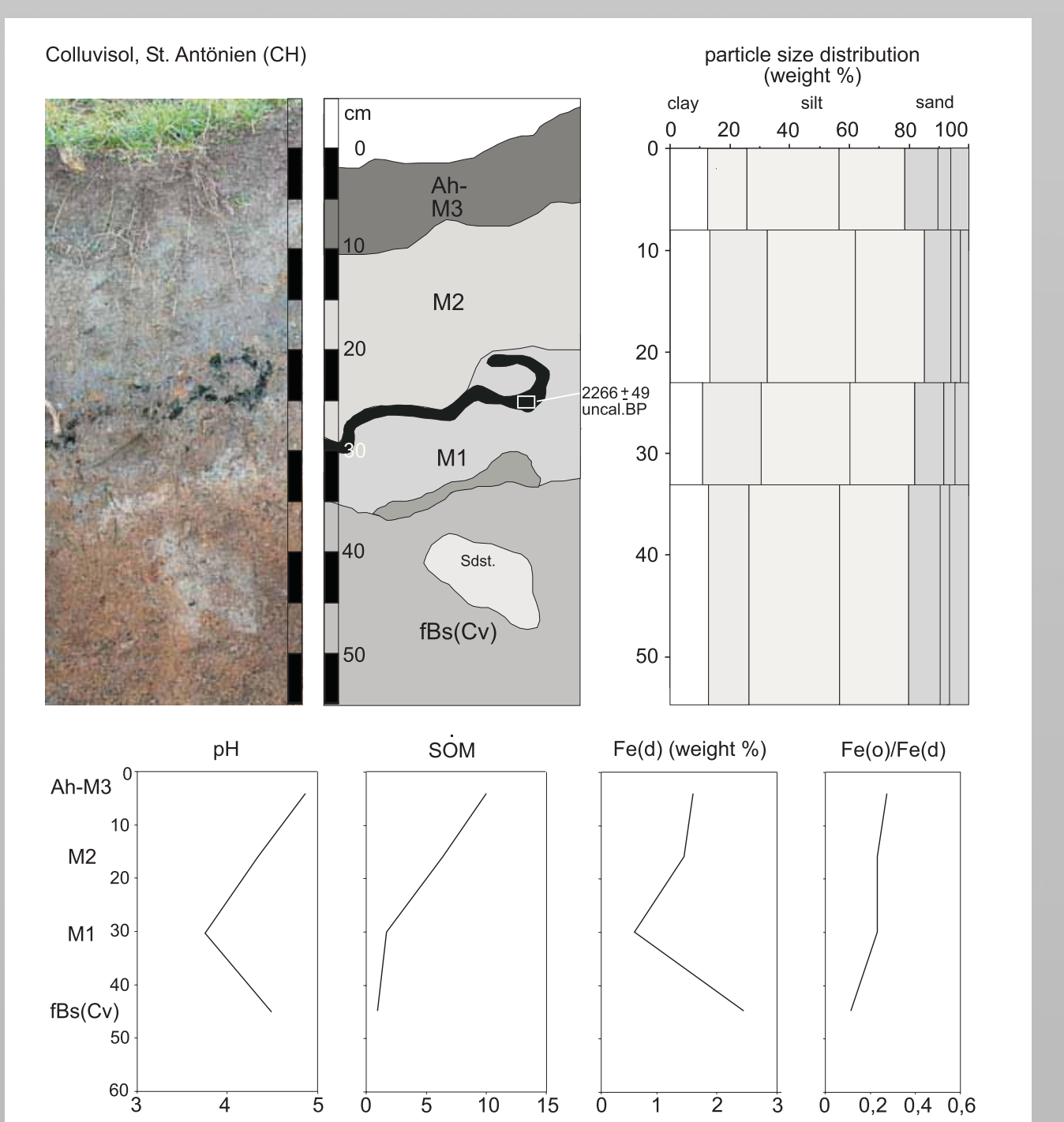
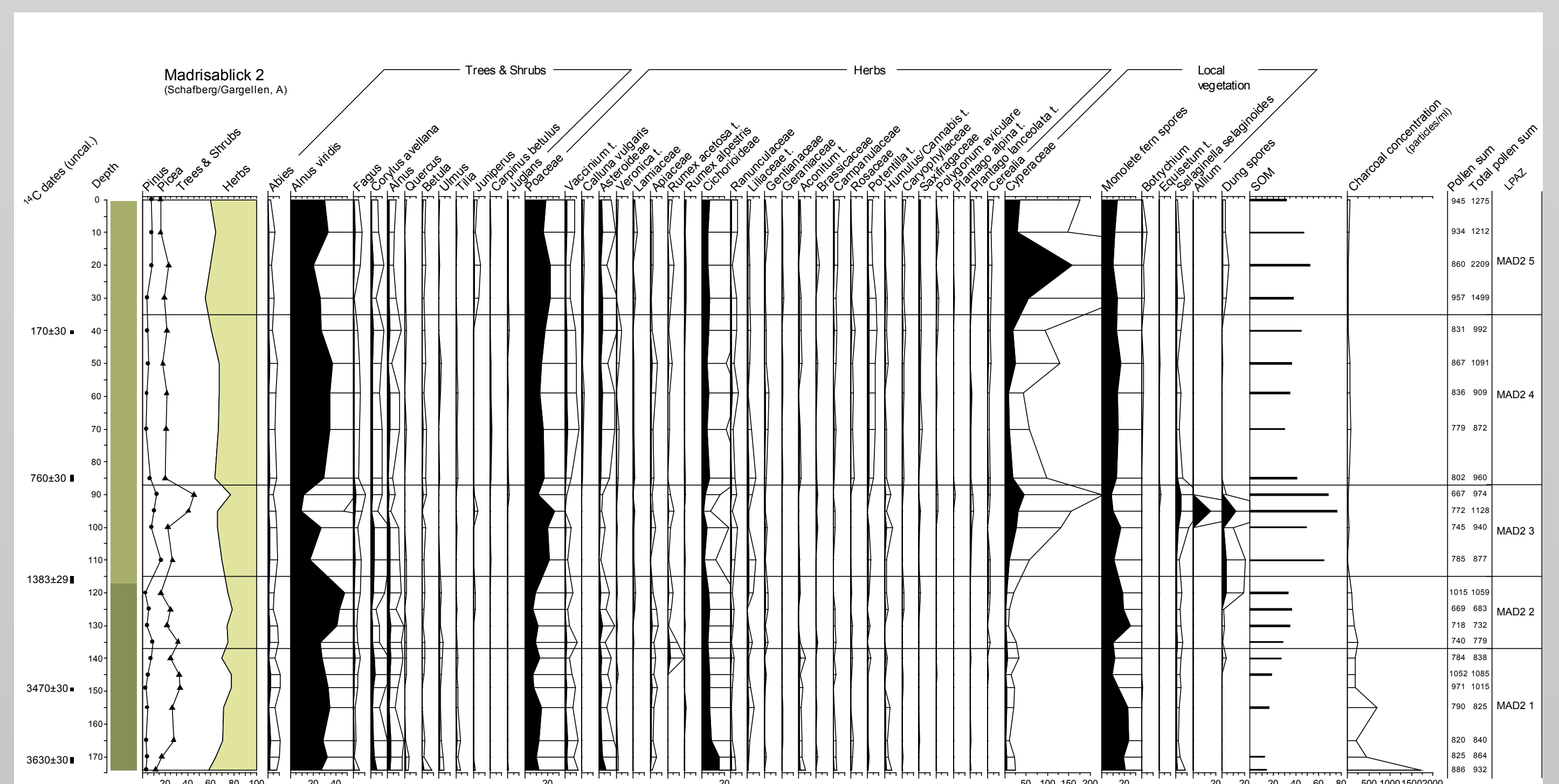
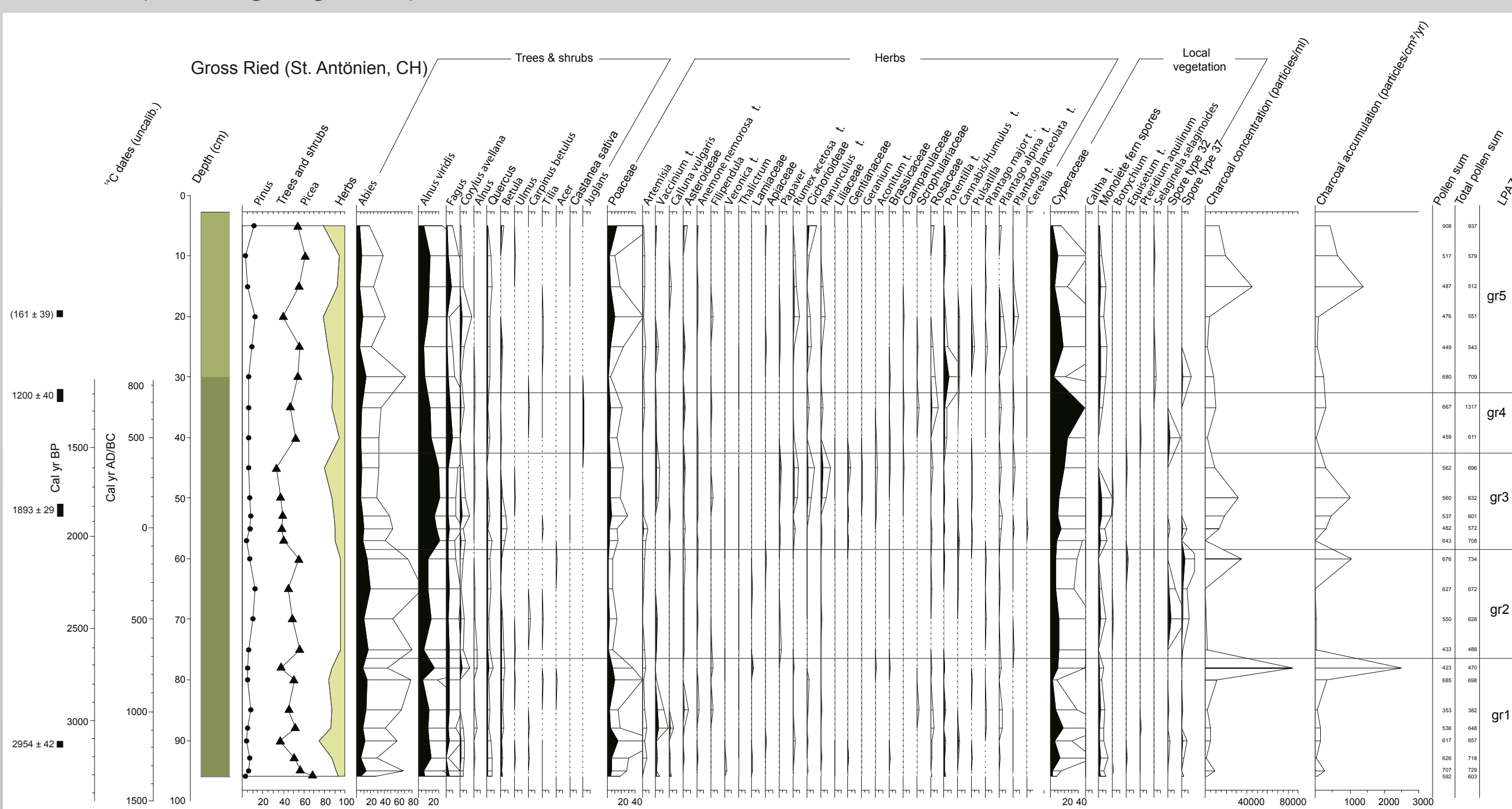


Fig. 7: Colluviosol with embedded charcoal layer (St. Antönien, CH).

## Palaeoecology and Geoarchaeology

### Bartholomäberg

First human impact is well documented since the Early Bronze Age. The forest was cleared with fire to create open land for settlements and pastures. Human activity increased again during Iron Age and the Middle Ages. Combining pollen and soils it was possible to reconstruct fire and land-use history at different scale.

### St. Antönien

The first distinct phase of human impact can be detected in the Middle Bronze Age, with maximum influence during the Late Bronze Age. The spruce forest was cleared to gain pasture land. In this case rising fire activity can be merely recognized during the Iron Age. This is in good accordance with occurrence of Iron Age charcoal layers in the soils.

### Schafberg/Gargellen

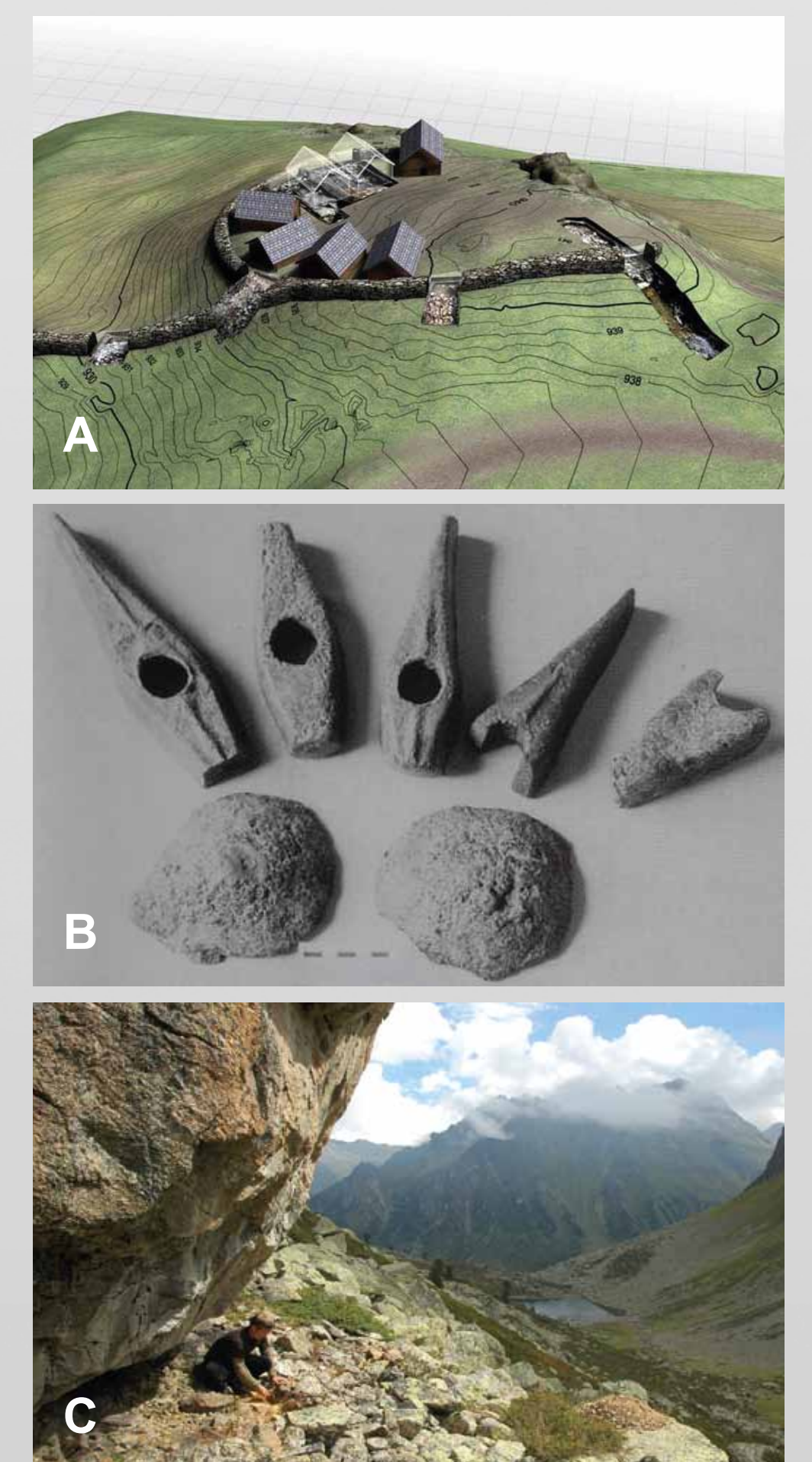
The subalpine spruce forest was already cleared during the Early Bronze Age in order to gain pastures. The fire induced deforestation is associated with the spreading of *Alnus viridis*. The High- and Late Middle Ages are characterized by maximum grazing indicators percentages and increasing biodiversity.

## Archaeology

Settlement activity in the Friaga Wald (A) started in the Early Bronze Age, its fortification dates back to the Middle Bronze Age (Krause 2007). In the vicinity a number of small sites evidence phases of occupation dating to Late Bronze and Iron Age. So far the first hints of mining activity are from the Iron Age (Röpke & Krause 2013).

In the entrance of the high valley a Late Bronze Age hoard (B) (ingots of bronze) was found in Montagna (Schiers). This is also where the first Late Iron Age settlement appeared, followed by one in the Roman Period and Middle Ages. In St Antönien, the oldest archaeological find, a lance, belongs to the Late Iron Age (Rageth 2000).

The abris (C) and „Alpwüstungen“ do not provide artifacts except some microliths. Radiocarbon dates from fire places suggest seasonal occupation since the Early Bronze Age. „Alpwüstungen“ document human activities during the Late Iron Age, the Roman Period and the Middle Ages. Additionally a lance of the Late Iron Age was found.



## Synthesis

- During the Bronze Age the climatically unfavourable Northern Alps were already settled.
- Vast clearances to create pastures in the subalpine region indicate the development of an agro-pastoral economy.
- So far there is no evidence for Bronze Age mining activity.
- Expansion of pasture land in prehistoric times can be regarded as an active process. The deforested subalpine zone offered good conditions for pasturing.
- Permanent occupation in Bartholomäberg, seasonal occupation in the upper regions Gargellen and St. Antönien.
- Diverse land-use patterns and archaeological evidence in Bartholomäberg/Gargellen and St. Antönien throughout the Bronze Age raise the question of colonization by different cultures.

## Acknowledgements

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