Pile dwellings in Canton Bern

Numerous sites dating from the Late Stone Age and the Bronze Age are located on the lakeshores of Canton Bern, often submerged under the term “pile dwellings.” Six of these were selected to represent the canton in the UNESCO list of World Heritage sites. A particularly large number of pile-dwelling sites are concentrated around Lake Biel, and at least one was found in the small Bremgarten section of Lake Neuchâtel. Most of them were discovered during the first Jura Waters Corridor which was carried out in the 1870s. Numerous small lakes on the Swiss Plateau, including the Inkeri, Lobago, Burglach and Mora Lakes as well as lakes that have completely silted up and are today flat land, were once locations of pile-dwelling settlements. Lake Thun has only yielded a few sites, and so far none at all have been found on Lake Biene. We can assume, however, that these lakeshores were also settled, at least in some places. Their steeper shores and higher lake levels make it harder to discover sites.

Organic finds from lakeside settlements give us an insight into everyday life in the Late Stone Age. Wooden cups (Sutis-Lattrigen, Rüti), curved-ribbed bowls (Le Landeron, Le Landeron), saddle (Tannw., Bahnhof), hat loop (Sutis-Lattrigen, Hauptstation), flint knife (Sutz-Lattrigen, Hauptstation); roll of fabric and bobbin comb used to hackle flax (Nidau, BKW); ladle (Twann, Bahnhof); hafted sickle (Aescher, Fassnächtli). Sc. 1:4.

How the pile dwellers lived

The sedentary lifestyle of the Late Stone Age, which involved crop cultivation and animal husbandry, spread from the east along the River Donau and via the Mediterranean region into Europe, gradually replacing the nomadic hunter-gatherer lifestyle from around 8000 BC onwards. These new influences began to arrive north of the Alps from around 5500 BC onwards. The earliest pile dwellings in our region were built around 4300 BC on the shores of the Sarnen Plateau. The houses were timber-built. Usually the piles that were driven into the ground are the only elements that survive. The villages often lasted no more than a few years. Their inhabitants grew cereals and other crops in the surrounding areas. They kept cattle, sheep, goats and pigs and managed the woodlands. Hunting game and gathering wild plants were still a substantial part of their subsistence. In addition to serving as important transport routes the lakes, of course, also provided a variety of food.

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Of the hundreds in the pile-dwelling settle-
ments, only the piles driven into the ground
will survive today. Some of them are up to
6,000 years old. Piles that were felled at the
same time – as indicated by dendrochronological
dating – can often be put together to form ground-
plans. This information allows us to reconstruct
the growth pattern of a Late Stone Age or
Bronze Age settlement and what it perhaps
looked like. The picture gives an impression of
a village from the period around 3,000 BC on Lake
Bienne.

Forgotten villages
As early as 1811 the first pile-dwelling site on Lake Bienne
was entered on a map of Nidau. In the 1860s the Zurich
scholar Ferdinand Keller coined the term “pile dwellings”
when writing about archaeological sites with numerous
piles driven into the lakebed, which he correctly interpreted
as the remains of past villages. The first Jura Waters Correction (1868–1891) shifted the
focus of pile-dwelling research from lake Zurich to Lake
Bienne. When the lake levels were lowered the piles of
occupied settlements around 2,700 BC. Sc. 1:8.

The oldest piles from Canton Bienne have been archaeo-
logically monitored since the 1980s. The aim is to
track the erosion processes at the sites and, where re-
quired, to put in place pro-
tection measures or carry out
rescue excavations. The hope is for future generations to
be able to benefit from the previous cultural heritage from
the Late Stone and Bronze Ages.

The lakeside and wetland
settlements in Canton
Bienne have been archaeo-
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tection measures or carry out
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the Late Stone and Bronze Ages.

Underwater and wetland archaeology
Research on archaeological settlement sites in water and in
waterlogged ground began around the mid-19th century.
Modern underwater archaeology, however, only developed
from 1960 onwards thanks to the invention of the regulator,
which allowed for autonomous diving. Today, the established
method of working is technically quite challenging and the
diving equipment must meet very high safety require-
ments.

Numerous pile dwellings are today located away from the
water on waterlogged shorelines or in bogs. Thanks to the
oxygen-deprived atmosphere the preservation conditions for
organic remains are ideal, much like in the lakes. That is why
such sites are of the greatest scientific value. Natural scien-
tific analyses on seeds, fruits and pollen, for instance, provide
important insights into dietary habits at the time.

Dendroarchaeology: wood as a source of information
The annual growth rate of a tree is primarily dependant on
weather conditions. All trees in a region are similarly affected,
which, over the years, leads to a uniform and characteristic
pattern of narrow and wide growth rings. Owing to the tree-ring
sequences of wood samples have been measured, standard
chronologies are studied and comparable patterns identified.
Ideally, this results in felling dates to the exact year. This is
often the only way of associating the piles with the ground-
plans of individual houses. The timbers also provide important
insights into settlement dynamics and forest management.

Since the large-scale excavation carried out in Twann from
1974 to 1976, dendrochronology has remained a permanent
component of Bern’s archaeological research. So far almost
30,000 timbers have been analysed in our very own dendro-
chronological laboratory and innumerable settlements and
settlement phases have been dated.

The dendroarchaeological section of Bern’s archaeological
research has been an important component of the preservation
of fragile archaeological sites. So far almost 30,000 timbers
have been dated, including the installation of stone blocks, are
required in highly exposed areas in shallow water, where
the waves break in stormy weather, or in locations with
significant elevation differences in the terrain.

Protecting instead of excavating
Artificial lowering of the lake levels, developing large sections
of shoreline and busy shipping traffic lead to ongoing shore-
line and lakebed erosion in many lakes on the Swiss Plateau.
As a consequence numerous prehistoric sites are acutely
endangered or have already been destroyed. Because it is
impossible to excavate them all, various methods for the
preservation of the fragile archaeological layers have been
developed and tested since the 1990s. Covering the lakebed with geotextile and weighing it down with a gravel fill has re-
vealed itself to be the most effective protection measure and
has already been employed at several sites in Lake Bienne.
However, this method is not suitable for every site. Larger
constructions, including the installation of stone blocks, are
required in highly exposed areas in shallow water, where
the waves break in stormy weather, or in locations with
significant elevation differences in the terrain.

One ring per year – narrow or wide depending on
the weather conditions. Starting with long lines,
the overlapping tree rings can be fitted

together in a standardized chronology that
must be further and further back over the millennia. In stormy, weather conditions and high wave
activity the lakebed is disturbed and certain
areas of the shoreline are gradually swept
away. The result of the fragile archaeologi-
cal layers being exposed and destroyed.