Overview of the rear of Lauterbrunnen Valley

1 Former smelting plant Sichellauenen

- 2 Ruins of the smelting facilities at Trachsellauenen
- 3 "Good Hope" gallery
- 4 "Sun of Mercy" gallery
- 5 "Luck bestowed" gallery
- 6 "Increased Blessings" gallery



Ground plan of the smelting works and miners' living quarters



A.2 Small smelting furnace (silver smelting?)

Smelting furnace walls destroyed by an avalanche in 1931

A.3 Forge

B Bellows room

Repairs and alterations

Cellars beneath the kitchen

D Miners' common room

C Kitchen

E Stairwell

TRÖMMELBACHFÄLLE



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Useful information: Getting here by postbus 141 from Lauterbrunnen to the stop "Stechelberg Hotel" (timetable www.stechelberg.ch). From there it is an hour's walk via the Mountain Restaurant Trachsellauenen to the ruins of the smelting furnace and the miners' living quarters (information panels on site). The galleries may only be entered with an expert guide.

Stechelberg Tourism provides guided tours and further information: Tel 033 855 10 32, info@stechelberg.ch, www.stechelberg.ch

References: Adriano Boschetti, Daniel Gutscher, Die Ausgrabungen in den Verhüttungsanlagen bei Trachsellauenen 1992. In: Archäologie im Kanton Bern 5, 2004, 543–576; Walter Thut, Kristalle, Metalle, Steinkohlen – der Bergbau. In: André Holenstein (Hrsg.), Berns goldene Zeit – Das 18. Jahrhundert neu entdeckt, Bern 2008, 115–118; Jean-Pierre Saheurs, Die Blei-Zink-Baryt-Lagerstätten bei Trachsellauenen (Berner Oberland / Schweiz). Diss. Bern 1974.

Frontispiece: The conserved remains of the smelting works and miners' living quarters as seen from the northwest.

Picture credits: Historical view: Bernisches Historisches Museum; Overall map: Swisstopo JA100012; all others: Archaeological Service of Berne.

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LAUTERBRUNNEN Ore smelting facilities at Trachsellauenen

Archäologischer Dienst des Kantons Bern Service archéologique du canton de Berne



The ore smelting site in Trachsellauenen once comprised 18 gallery roofs. The depiction from 1790 shows the entire site within its largely deforested surroundings with the mining galleries in the background. From 1990 to 1992 the Archaeological Service of Canton Bern carried out an investigation. The foundations of the smelting works were conserved in 1994 with support from the lottery fund, the municipality and private individuals.

Plan of the site with the smelting works and miners' living quarters (1), "residence" (2), stamp mill (3) and Freudenstein (4).



The mining industry – Boom and decline

Besides lime and charcoal burning, the extraction of silver, lead and iron has been an important source of income in the Lauterbrunnen Valley since the Middle Ages. Once almost completely deforested for firewood, the valley is now part of the UNESCO World Heritage site Swiss Alps Jungfrau-Aletsch and promotes its natural beauty.

The economic crisis prompted by the Thirty Years' War motivated Bern to reactivate the area, and in 1638 a department was created for that purpose. The focus was on lead, zinc and barite deposits in the crystalline rock. The effort actually outweighed the returns, however, and hardly any revenue ever reached the treasury. The mine quickly became a popular tourist destination, and one of its visitors was Johann Wolfgang von Goethe, who came to the valley to walk on the Tschingel Glacier in 1779.

In 1805 Hans Conrad Escher, a civil engineer and geologist from Zurich (builder of the Linth Canal) was tasked by the Bernese government with evaluating the productivity of the plant. Based on his assessment, mining was officially suspended, although the mine continued to be operated on a smaller scale by locals until around 1860.

Rock sample with a vein of silver-rich lead ore, or more precisely galena or galenite (PbS). The veins are 10-50 cm, in exceptional cases up to 1 m thick.



Smelting

From the stamp mill the crushed ore was brought to the smelting works where the silver was extracted. The process consisted of four steps: by roasting the clean ore in a hearth, the so-called litharge, or lead oxide formed. Subsequently, it was smelted into crude lead in a shaft furnace. The shaft of that furnace was still upstanding to a height of some 7 m until it was destroyed by an avalanche in 1931. Massive masonry blocks can be seen to the west of the shaft furnace.

In order to extract the small amount of silver contained in the crude lead, it had to be oxidised and melted in a so-called cupel, which separated the silver from the lead oxide. The fourth step involved reintroducing the lead oxide into the shaft furnace, where it was reduced to pure lead. The huge bellows inside the smelting works were driven by a waterwheel and helped heat the fire to the necessary temperature of between 800 and 960°C to melt the ore.

Gallery no. 2 (No II) in Baroque lettering beside the entrance.

Mouth of the "Sun of Mercy" gallery (1785-1805).





The different mines

Ore extraction took place underground in mining galleries, allowing year round operation. The poetic names of the galleries suggest expectation was greater than return: sun of mercy, luck bestowed, increased blessings and good hope. The surviving maps show an ingenious system of galleries which followed the veins of galena and zinc-blende down to a depth of 300 m. The silver content was around 30-120 ppm - hardly more than 2.3 kg of silver would have been extracted over the mine's entire lifespan. The yield of lead was not significant either; even during the heyday of the smelting works it would not have exceeded 1500 kg per year. The rock containing ore was separated from the barren rock outside the galleries. This is still attested to by massive rock dumps in front of the gallery mouths. The ore was dragged on sleighs to the stamp mill and washing plant, sometimes overcoming differences in altitude of 800 m.