

MAPS OF GEPATSCHFERNER, Austria

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1. Reprinted map "Die Zunge des Gepatsch-Ferners 1886/87"

Systematic modern glacier mapping in the Alps began in the year 1879, when a meeting called "Alpine Tagung" took place in Geneva, Switzerland. On this occasion, it was requested that the then-presumed "minimum position" of as many Alpine glaciers as possible be documented by producing accurate, large-scale contour maps for purposes of glacier research. By the end of the 19th century, more than a dozen glaciers had been surveyed and mapped, mostly at a scale of 1:10,000. These maps are geometrically comparable with modern maps and mainly depict glacier tongues, but in a few cases also entire glaciers (Brunner 1987, in press).

The reprinted map of the Gepatschferner tongue in the Oetztal Alps is one example of that early, systematic glacier cartography. The field work was done in the summers of 1886 and 1887 by Sebastian Finsterwalder with A. Blümcke and K. Schunck as collaborators using a tacheometric survey - a very modern technique at that time (Finsterwalder and Schunck, 1888). Finsterwalder and his collaborators and disciples decisively influenced the beginning and continuation of Alpine glacier surveys. The original map of the Gepatschferner tongue is a monochrome copperplate print. The reprint cannot achieve the quality of the original print, but it is certainly an interesting document. Note that orientation is not to the north and that the tributary glacier (the "secondary tongue") still joins the main tongue.

2. Maps depicting changes in geometry of the Gepatschferner tongue

In addition to the map of 1886/87, maps of the entire glacier were prepared in 1922 (Finsterwalder 1928) and 1971 (Brunner 1978, 1985). Some unpublished manuscript maps exist, too. This material has enabled maps to be elaborated which show changes in area and thickness of Gepatschferner.

The first sheet, "Veränderungen der Zungenlagen des Gepatschfernens seit 1886/87" = changes in position of the Gepatschferner tongue since

1886/87, is a set of five trichromatic maps at a scale of 1:20,000 depicting tongue positions in 1886/87, 1922, 1940, 1953, and 1971. The glacier margins of the directly foregoing tongue position have been added in red for comparison. The map grid has been drawn fully in order to facilitate comparison between the various glacier stages.

The second sheet shows, at a scale of 1:20,000, the reconstructed Little Ice Age maximum of the glacier tongue around 1850 as well as more recently surveyed tongue positions. Note that the large area of presumably vanished ice at Hinterer Oelgrubenferner is, in reality, a rock glacier which probably contains important amounts of perennially frozen ground. Interpretation of glacier retreat may be questionable in this case. Three thematic maps representing changes in tongue geometry between two consecutive surveys are also given. Changes in area and thickness of the ice are recognizable through displacements of contour lines and colour shading; zones of increasing surface area or ice thickness are marked in red and zones of decreasing surface area or ice thickness in yellow. In addition, a diagram summarises the annual thickness changes up to 1971.

3. Glossary

The following glossary helps to translate the German terms of the map legend:

Zungenstand	tongue position
Fels/Schutt	bedrock/scree
Alpiner Pflanzenboden	Alpine vegetation-covered soil
Flächenabnahme	decrease in surface area
Flächenzunahme	increase in surface area
Höhenabnahme	decrease in surface altitude
Höhenzunahme	increase in surface altitude