

glacier waves seem to be of real importance in connection with Nye's new theoretical investigations on glacier flow.

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REFERENCE

1. Finsterwalder, R. Neue Ergebnisse der Eishaushaltmessung an Gletschern. *Mitteilungen der Geographischen Gesellschaft in München*, Bd. 45, 1960, p. 147-51.

ALETSCHGLETSCHER. 1:10,000. Sheet 3, 1957.

THIS new map, compiled by the Eidgenössische Landestopographie, Wabern-Bern, and the Abteilung für Hydrologie der Versuchsanstalt für Wasser- und Erdbau at the Technical High School at Zürich, covers the lower reaches of the Aletsch Glacier from the Märjelen See on its left bank and the Mittelaletschgletscher on the right, to its present terminus. Incidentally the Märjelen See with its grand and famed scenery had shrunk from 600 m. in 1938 to 110 m. in length in 1957.

Three more sheets will eventually cover the whole glacier to its source. The map shows not only the present extent of the ice, but also by means of red and violet lines, its margins around the *Hochstand* of 1860, and during the Würm stage, respectively. During the Daun substage, the snout may have lain some 8 km. or so lower than at present—that is to say right into what is now the Rhône Valley. During the maxima in the Ice Age the Alpine glaciers covered most of Switzerland, but the present ice cover cannot be regarded as just a recession from that glacierization. There have been warm periods when the ice cover was less than today. On the other hand, early in A.D. 1600 the glacier snout lay some 2 km. further down than it does now, and it again reached this point in the middle of last century when the ice was about 300 m. thick where the snout now lies; even in 1927 it was still very thick at this point.

A note from the producer of the map rightly suggests that this survey will provide a comparison with the earlier states of the glacier and serve as a basis for co-ordinating numerous individual observations, particularly those of the last 20 years. It will also provide the basis for future investigations of the glacier. For years the accumulation along the main glacier has been recorded by means of snow and precipitation measurements, and the wastage determined by ablation measurements (highest values about 16 m. per annum), by measurements of the absolute change in elevation of the surface along control profiles and by stream-gauging measurements. The surface velocity (maximum about 200 m. per year) has also been extensively measured. In addition, the ice thickness (maximum about 800 m. at the Konkordiaplatz) is known from seismic measurements at a number of places.

This new map of the longest and best-known ice stream in the Alps thus offers many possibilities for research, both in regard to its past fluctuations and for comparison with other glaciers. This, of course, is facilitated by the convenience afforded by the Research Station at the Jungfrauoch.

G. SELIGMAN

NINE GLACIER MAPS: NORTHWESTERN NORTH AMERICA. [With pamphlet of same title. [v, 37] pp.] *American Geographical Society, Special Publication No. 34*. New York, American Geographical Society, 1960. \$3.00.

The nine glaciers are:

The Lemon Creek Glacier
The Blue Glacier

The Polychrome Glacier
The West Gulkana Glacier
The Worthington Glacier
The Little Jarvis Glacier
The Bear Lake Glacier
The Chikuminuk Glacier
The McCall Glacier

All these glaciers are situated in various parts of Alaska, except the Blue Glacier which is in Washington State.

The maps were made, mainly in 1957-58, by vertical air photography with ground control but some of them have not been finally "field-checked."

The reproduction is very good indeed and gives much detail—moraines, snow, firn, ice, crevasses, etc. The contour interval on the glaciers is 5 metres and in the surrounding terrain 25 metres. The scale in each case is 1:10,000. On each map there is a small-scale plan showing the exact position of the glacier.

Accompanying the maps there is a pamphlet, reference as above, which sets out in satisfactory detail the conditions under which the project was carried out, with the mapping and organizational problems and much other information. There are also three appendices giving full particulars of the location of, and access to, the glaciers, glaciological notes and a list of the reports on which the map-making was based. It also contains very fine illustrations of particular features on some of the glaciers.

These maps and the pamphlet constitute a valuable addition to our knowledge of North American glaciers and should prove of great value for future research, particularly in connection with the fluctuation trends over this vast area.

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