

($\rho g d + p_0$) producing the "Orowan spreading" of the material just above the depth d exceeds the horizontal compressive stress (p_0) by $\rho g d$. The rate of vertical compression so produced must equal the rate of longitudinal spreading (constancy of volume and plane strain), and we have seen that such a stress difference $\rho g d$ produces a strain-rate $\dot{\epsilon}$. Thus, the "Orowan spreading" at the bottoms of the crevasses is exactly sufficient to ensure continuity with the longitudinal extension rate of the underlying layers of the glacier. Higher up the crevasse walls the Orowan spreading is smaller, by reason of the smaller depth, and so the ice here does not extend longitudinally as fast as the underlying ice of the glacier. This is why the crevasses open up. The argument is strictly correct for very closely spaced crevasses. For a wider spacing, further analysis is necessary.

REFERENCES

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COMMENTS ON CREVASSE DEPTHS

By G. SELIGMAN

I BELIEVE that I was originally responsible for the statement that crevasses in temperate glaciers did not in general exceed 30 m. in depth, although Dr. Orowan, with whom I often discussed the point, no doubt based his views not on my experience but on theoretical grounds. In my paper "The structure of a temperate glacier," *Geographical Journal*, Vol. 97, No. 5, 1941, p. 301, I wrote: "I believe the great depths attributed to crevasses in the Alps are mythical. We explored many, and the greatest depth we reached was 30 m.; a crevasse said to be at least 60 m. deep proved to be no more than 25."

My subsequent observations in the Alps confirmed this assessment, but no doubt there can be exceptions, one of which Dr. Loewe has encountered.

It would be interesting to hear of actual measurements from colder regions than the Alps which could throw further light on Dr. Loewe's statement that many high ice walls in those regions must be at 0° C.

The Editor,

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SIR,

"*Jökla mýs*"

Small spheroidal, silt-packed, moss cushions, or polsters, are abundant on the terminus of Matanuska Glacier (lat. 61° N., long. 147° 41' W.) in the Chugach Mountains of south central Alaska. In outward appearance, these resemble "jökla mýs" (glacier mice), described and named from observations and collections on Hrutárjökull, Iceland, by Dr. Jón Eythórsson (*Journal of Glaciology*, Vol. 1, No. 9, p. 503, 1951). The jökla mýs described were moss-covered stortes, whereas specimens from Matanuska Glacier are concentric moss layers in which sandy silt and a few small pebbles have been incorporated during growth.

On 10 September 1950, L. L. Ray, F. C. Whitmore, Jr., A. C. Orvedal and I made a reconnaissance of the broad terminus of Matanuska Glacier. The terminus, at an altitude of approximately 1700 ft., is a gently sloping surface mantled, in places, by mounds and ridges of cobbly ablation moraine with relief as much as 50 ft. The polsters were called to my attention by Dr. Ray, who first noticed them; others of the party aided in determining their widespread occurrence.

Polsters occur on gentle slopes of bare melting ice in about the same abundance as in waters of supraglacial streams; a few were collected on patches of ablation moraine. Where they rested on exposed ice surfaces, they sometimes lay in shallow wells thawed by their insolation. There was no apparent preferred orientation of the polsters in the thaw wells.

The dominant shape is a distinctly oblate spheroid*; the shortest axis does not exceed one-half the longest, which ranges from 1 to 6 in. (2.5 to 15.3 cm.). Irregular shapes are less common and of similar size. Surfaces are firmly bound with living moss, although on spheroidal types one of the two flatter sides, usually that on which it has rested most recently, has a somewhat less luxuriant

* A photograph submitted by Dr. Benninghoff showed forms practically identical with those in the photograph which illustrated Dr. Eythórsson's letter mentioned above.—Ed.