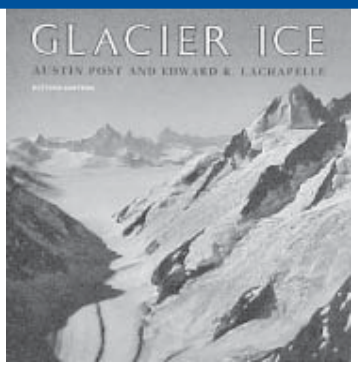


Ice Twice

Northwest scientists re-release their classic photographic glacier survey

Glacier Ice
by Austin Post and Edward R. LaChapelle,
144 pp., University of Washington Press, 2000.

Ice has the power to sculpt the landscapes of the earth's surface and of the human imagination. Glaciers, masses of ice and rocky debris formed by years of accumulated snowfall, shape the knife's edge pinnacles on mountain summits and carve many of the world's valleys and canyons.

From dynamically changing temperate glaciers to the awe-inspiring magnitude of the polar plateaus, *Glacier Ice*, written by glaciologist and hydrologist Austin Post, formerly of the U.S. Geological Survey, and snow-ice physicist Edward R. LaChapelle, emeritus professor at the University of Washington, portrays a magnificent visual panorama of aerial glacier photography, pairing scientific detail with stunning black and white glacier photography.

Originally published in 1971, the first edition of *Glacier Ice* has been long out of print, but never out of demand. In recent years, the International Glaciological Society of Cambridge, England has endorsed efforts to reprint classic works in glaciology. That encouragement and the continuing support of the University of Washington Press have inspired Post and LaChapelle to launch a revision of their classic volume.

In *Glacier Ice*, Post and LaChapelle compile some of the best of early aerial glacier photography in western North America, much of which derives from their own research efforts between 1957 and 1964. Aerial reconnaissance photography of glaciers first got its start in 1955 with the work of UW's Richard C. Hubley, who worked extensively in the North Cascades. After Hubley's untimely death in northern Alaska in 1957, LaChapelle continued the Cascade Range photo flights until 1960. Post then expanded the annual photo-survey flights to include the northern Pacific Coast of North America and into the interior of Alaska.

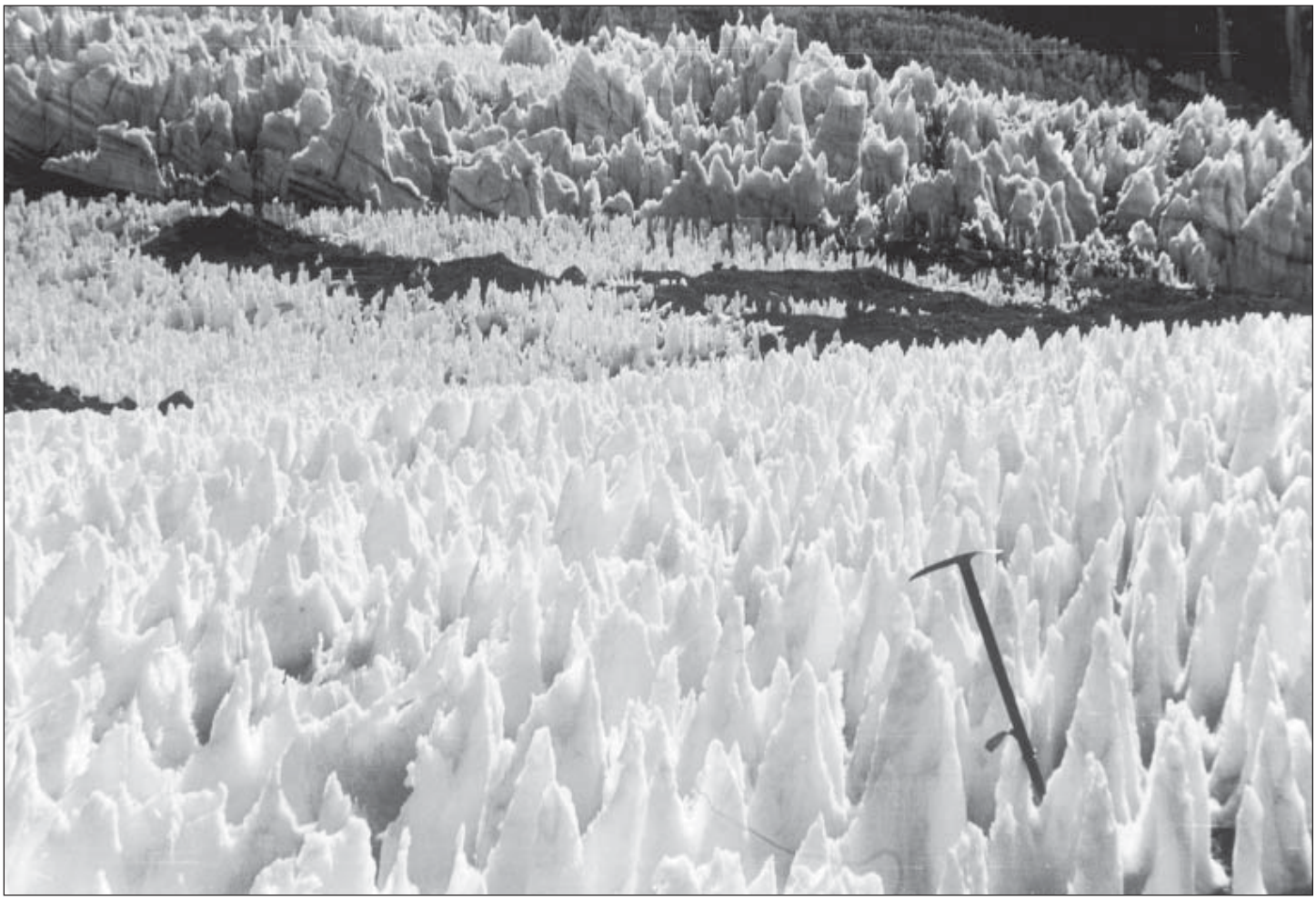
Aerial photography allows scientists to see glacial features on a massively larger scale than ground-based observations. Moraines, accumulations of debris created by glacier erosion and flow, are one example of large-scale glacial features critical to understanding the mechanisms of glacier activity.

Medial moraines are narrow ribbons of rock that originate where two ice streams join together. Viewed from the air, most of these moraines look like orderly two-lane highways that curve and wend through icy S-curves. Other medial moraines are

Nunataks *are areas of exposed bedrock in ice fields—islands in a sea of ice. Bagley Ice Field, south central Alaska. Photo courtesy of University of Washington Press.*

Review by Erica B. Goldman

(Top left and opposite page) Pinnacles form as the result of uneven melting on glacial surfaces. Large pinnacles droop to form *nieve penitentes* or "penitent snow." (Top right) Medial moraines transect glaciers in patterns that reveal the time scale of glacial flow. Marble cake appearance (Bottom right) reflects periods of rapid surging. All photos courtesy of University of Washington Press.



anything but orderly, twisting and swirling like chocolate marble cake. These are the products of glacier surges, or waves of intense and rapid glacial flow. So, aerial views of moraines provide the critical clues about the varying rates of glacier flow over extended periods of time.

While *Glacier Ice*'s outstanding photography spoke deeply to my sense of wonder, the accompanying text left me wondering. In spite of Post and LaChapelle's clear and concise writing style, which is geared toward readers with a fairly high level of scientific understanding, I had difficulty determining which facts about glaciers were the most salient. I learned a lot about kinds of ice, features of glaciers, the forces that affect glacial dynamics, and how glaciers transform landscapes, but I had to struggle to put together the big picture. As a text, *Glacier Ice* lacks internal cohesion, following from the photographs rather than telling a unified story about glaciers and how they work.

Ice and the imagination

To a lay person, much of the appeal of glaciers derives from how people perceive and label them. Ice has inspired the human imagination in all parts of the world. Post and LaChapelle describe the *nieve penitentes*, Spanish for "penitent snow," that occur frequently in the high Andes of South America. Like ranks of hooded monks with their heads bowed in prayer, these standing rows of ice pinnacles are the result of uneven melting on the rough surface of the glacier. When the air is cold but the sun is strong, snow evaporates from the high points but melts in the hollows in between. This process forms pinnacles, which can grow large and droop over, creating "penitent snow."

The scientific jargon of glaciology is riddled with similar interesting words, many of which originate from other languages and reflect the international flavor of glaciology as a science. For example, *jökulhlaups* is an Icelandic word describing catastrophic glacial floods, while *nunataks* is a word of Greenlandic Eskimo origin that describes a phenomenon seen in ice fields, where exposed mountain peaks poke through a sea of ice. While Post and LaChapelle do highlight examples of the cultural heritage behind the study of glaciers, they could have capitalized on it even further to make their text more broadly interesting.

In spite of the coffee-tablesque quality of its presentation, *Glacier Ice* is not coffee table reading. Still, this work is an incredible visual tableau, beautifully portraying large-scale features of glacial landscapes. It gave me a real feeling, if not a thorough technical understanding, for how glaciers work. *Glacier Ice*'s powerful photographs also gave me a severe case of wanderlust—an important measure of success in my book—and reawakened my not-so-latent desire to climb mountains and explore icy landscapes. ■

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