

## Reviews

POST, A. and E. R. LACHAPPELLE. 1999. *Glacier ice. Revised edition*. Seattle, WA, University of Washington Press, in association with International Glaciological Society, Cambridge, England. 144 pp. ISBN 0-295-97910-0, paperback. \$27.95.

YEARS ago, when as a student I became interested in glaciology, my friend Michael Hambrey had this wonderful large book *Glacier ice*, which I envied him. I would leaf through the pages, marvelling at those wonderful ice-scapes, and wonder if I would ever see any those incredible glacial phenomena myself. Unfortunately, by the time I decided to buy my own copy, the book was out of print.

Many of us who are involved in glaciological research are delighted that the IGS has, in collaboration with the authors, Austin Post and Edward R. LaChapelle, and the University of Washington Press, undertaken to publish a revised edition of this classic in glaciological literature.

*Glacier ice* aims to illustrate the fascinating and large variety of glaciological phenomena for the benefit of both scientists and laypersons. It was conceived after many photo-graphic reconnaissance flights during the 1960s along the north Pacific Coast of North America and the interior ranges of Alaska. As a result, the book lavishly shows almost all phenomena on and around glaciers, with a strong emphasis on North America. It does not attempt a global coverage, although it concludes with a chapter on "Temperate, subpolar and polar glaciers" which involves Greenland and Antarctica. Very few—but interesting—examples are from the Alps, the Himalaya and central Chile.

The stunningly beautiful aerial photographs which Post took with a large-format camera form the book's backbone. All the illustrations are in black and white, which, together with the excellent definition maintained in even the darkest of shadows and brightest of snowfields, lends the book an artistic flavor that has always reminded me of Ansel Adams' work. Terrestrial photos are added where necessary to complement the aerial views; they give a new scale to the pictures taken "from above". Some of the photo sequences are arranged like stories. In particular I like the series showing the gradual development of localized cirque formation via more and more extensive glacial erosion right up to the development of isolated, steep mountain peaks (figs 107–111).

All the pictures are described in brief but highly informative texts which take the reader on a guided tour of glacier formation and mass balance, flow, fluctuations, surges, a multitude of surface features and landforms created by glaciers. The prose is straight to the point and very clear. Despite being familiar with many aspects of glaciology, I was particularly impressed with such diverse sections as the formation of ice cups in firn and the repeated slow advance and fast retreat of actively calving tidewater glaciers.

Having first been published in 1971, has the book dated? Although few changes have been made to the text, several new pictures have been added in this edition to show recent events such as the eruption of glacierized Mount St Helens, Washington, in the chapter "Glaciers, volcanoes, and jökulhlaups", and the dramatic retreat of Columbia Glacier, Alaska, with "before and after" views. Re-reading the text, I was surprised to see how up-to-date it still is. A brief but thoroughly revised bibliography, including some Internet

addresses, leads readers to modern sources of glaciological information.

Most probably it was the authors' intent to retain the limited geographic coverage of the original edition. As a European reader I naturally would have liked to see some more Alpine, Scandinavian or even truly tropical glaciers included, but that would perhaps have entailed too much of a change in the style of the book. While I agree with the smaller format than the original, which makes the book more bookshelf-friendly, I miss the original hard cover, which, alas, might have made it too expensive. Modern image-processing techniques could have removed the scratches on some photos from Chile and Antarctica, which clearly were handled by people less expert than Post. Also, I never managed to find the arrow referred to in figure 102.

I find little wrong with the text, and the following minor points do not detract from its overall quality. On page 106, readers might get the impression that water-pocket ruptures are confined to glaciers on volcanoes. Tragic accidents in the Alps have shown that this is not the case. On page 111 is a reference to the no longer generally accepted idea of air cushioning of large landslides. Strangely absent from the chapter "Effects on the landscape" are the many beautiful lakes dammed by terminal moraines, which are such an integral part of beautiful mountain scenery such as that of the Alps or the Rocky Mountains.

Students of glaciology, naturalists and mountain-climbers will find the glossary of glacier terms very useful. Glaciological "novices" will gain immensely from reading *Glacier ice*, and "old hands" will be glad that the book has been resurrected, so we can once more dream about flying over those vast icefields and towering mountain ranges of Alaska and British Columbia.

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JÜRIG ALEAN

VAN DER VEEN, C. J. 1999. *Fundamentals of glacier dynamics*. Rotterdam, A. A. Balkema, x + 462 pp. Hardback edition: ISBN 90-5410-470-8, EUR 74.50/\$88.00/£52.00. Student paperback edition: ISBN 90-5410-471-6 EUR 36.00/\$42.00/£25.00.

If Paterson's classic text *The physics of glaciers* may be considered a bible of modern glaciology, then this recent book by Kees van der Veen is probably one of the newly unearthed gospels. *Fundamentals of glacier dynamics* preaches the basic mathematical techniques used by scientists in the analysis and understanding of glacier flow. Rather than provide an overview of current research interests, it gives a dedicated account of the nuts and bolts of better-established models and theories, and the rationale behind their interpretation and validation. Accompanying the wealth of mathematical detail is a concise explanation of the underlying assumptions and derivations. Both analytical and numerical solutions are discussed, as well as comparison of results with field data. A textbook with such emphasis on modelling has been long overdue in the glaciology world.

But the book is not just a compendium of models. Van der