defence measures. On the same lines, but possibly with less vision, Bering had made proposals to the Russian Senate 16 years earlier, when arriving back from his first expedition. In his document, presented to the Admiralty College and dated June 1746, Chirikov emphasized the need to use the Amur River, then in Chinese territory. He recommended developing farm land in the Ilimsk region and in Kamchatka, where he also wanted to protect the rights of native inhabitants against merchants and even servicemen; in his opinion this measure would strengthen the Russian presence. He also recognized the economic value of fur-bearing animals and different minerals, not only in Siberia but in the newly discovered American land. Finally, he wanted to develop the Russian naval presence in the North Pacific waters as a sign of sovereignty and to contain possible foreign interferences. In other words, Chirikov was truly a visionary, as everything he proposed materialized in the region, at least until Alaska was sold to the United States in 1867. (Bertrand C. Imbert, 116 Boulevard Raspail, Paris 75006, France).

FLUCTUATIONS OF GLACIERS 1985–90 (Vol. VI). Compiled by W. Haeberli and M. Hoelzle. 1993. Zurich: World Glacier Monitoring Service. xii + 322 p, maps, hard cover. ISBN 92807-1370-1. US$50.00.

This volume, number six in a series sponsored by several international scientific organizations, deals with observations of glacier fluctuations and mass balance during the period 1985 to 1990. The previous five volumes follow a largely similar, although not identical, format and cover five-year periods back to 1959. The publication, like those that preceded it, is a repository for glaciological field data from glaciers worldwide, where systematic observations on mass balance, glacier terminus position, and other ancilliary evidence have been collected on a regular basis.

If the data presented in a volume such as this are to be of use to, for example, the glaciological community modelling glacier–climate interactions, the material contained in the numerous tables must be presented clearly and the methods by which data are obtained documented. The compilers are at pains to achieve this goal, and have sent out both data sheets and instructions to the many national correspondents who make returns to them. I looked up several glaciers with which I am familiar in the field in order to provide a brief check on the compilation, and found reference to these ice masses to be dealt with clearly and precisely.

Data on the position of glacier fronts are presented for 624 glaciers in 23 countries. Mass balance observations, a more complex field task, come from 78 glaciers in 11 countries. Other suites of glaciological observations, for example on the changing volume, area, and thickness of ice masses, are available for smaller numbers of glaciers. Fourteen maps are also included in a large pocket at the rear of the volume. These are largely a result of donations by individual countries or institutions. Clearly any attempt to produce large numbers of such maps centrally would be prohibitively costly.

This is not a book for the generalist, but for the practising glaciologist. It is also a volume for reference libraries rather than individuals. The compilers and their national correspondents are performing a considerable service to the glaciological community and should be congratulated for doing so. (Julian A. Dowdeswell, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

ADVANCES IN ICE TECHNOLOGY. T.K.S. Murthy, W.M. Sackinger, and P. Wadhams (Editors). 1992. Southampton: Computational Mechanics Publications. 365 p, illustrated, hard cover. ISBN 1-85312-175-4.

This book is a compilation of 28 papers presented at the Third International Conference on Ice Technology, held at the campus of Massachusetts Institute of Technology, Cambridge, Massachusetts, in 1992. Though there are a few papers that describe experiences related to operating an icebreaker in the Arctic, the majority of papers deal with some technical problem related to ice technology or ice mechanics. Because the papers contained in the book were either invited by the organizers or contributed by the authors, the subjects discussed in the technical papers are quite diverse. The editors have compiled the book in five sections, but this reviewer would like to list the technical subjects discussed in the book.

There are seven papers associated with various aspects of creep deformation in ice. In four of these papers, the authors have presented their constitutive model and obtained values of some parameters from experimental results. One paper discusses safe landing and parking of large aircraft on a floating ice sheet near McMurdo Station, Antarctica. The remaining two discuss the closure of a borehole and the bending of ice sheets.

Next there are two papers on the propagation of waves in an ice–water system. One of these presents a comparison between theoretical and experimental results, whereas the other presents a solution of nonlinear equations associated with large amplitude waves. There are two papers on the subject of indentation tests. One paper presents the results of tests conducted on lake ice, and the other discusses the propagation of a macro crack during a test conducted in a large test basin.

The other subjects discussed in the book are: dynamics of river ice, topside icing of ships due to sea spray, freezing of sea water in harbors, full-scale trials of a Finnish icebreaker, field determination of strength properties of ice via sonic tests, model tests of hovercraft to break floating ice sheets, and ship operations and ice conditions in the Arctic.

With few exceptions, there is no common theme among the papers. However, all papers are related to ice technology or ice mechanics. Some of the papers present real advances in current knowledge, while some other papers discuss the current state of marine transportation in ice-covered waters. (Devinder S. Sodhi, Ice Engineering Research Branch, Cold Regions Research and Engineering Laboratory, US Army Corps of Engineers, Hanover, NH 03755-1290, USA.)