fuller discussion of environmental problems in the foregoing chapters.

Apart from such shortcomings, the book successfully conveys polar scientists' fascination with the natural environment of the islands of the Arctic and introduces the reader to many of the past and ongoing processes that shape them.

Review of *Sea ice—an introduction to its physics, chemistry, biology and geology*, edited by David N. Thomas & Gerhard S. Dieckmann (2003). Oxford: Blackwell Publishing. Xiv + 402 pp. ISBN 0-632-05808-0.

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To my knowledge, there is (as yet) no university course producing "sea ice scientists" in the way that there are university programmes for young oceanographers, glaciologists and so on. In the community of scientists working on sea ice, researchers come from different disciplines, such as geophysics, meteorology, oceanography, biology, chemistry, environmental science, physics, engineering, mechanics and mineralogy. This variety of disciplines illuminates how complex and diverse sea ice is as a research subject.

Despite the crucial role sea ice plays in climate and the environment, there are few books solely concerning sea ice. This new textbook is one of them. Moreover, whereas most sea ice books are limited either thematically or geographically (e.g. concentrate on either physics or biology of sea ice, or dealing only with sea ice in the Antarctic region), Thomas & Dieckmann's new volume addresses both the physics of sea ice and (to a slightly greater extent) sea ice biology, as well as some chemical and geological aspects.

The subtitle of the book indicates the editors' ambitious aim—to cover quite a lot of the disciplines related to sea ice within one book. Consequently, the individual book chapters are less detailed than journal articles or specialized books dealing with specific sea ice related issues or problems. After a foreword and introductory chapter giving overviews of the importance of sea ice and the history of sea ice research, the book is composed of chapters on growth, microstructure and properties of sea ice, sea ice thickness distribution, large-scale characteristics and variability, primary production, microbiology, sea ice as a habitat for polar marine mammals and birds, biogeochemistry, particulate flux from sea ice and palaeo-distribution of sea ice. In addition to these chapters, the book contains a glossary, a detailed index and colour plates. The contributions are written by leading North American, European and Australian scientists in fields bearing on sea ice research. Several of the authors are affiliated with past or ongoing sea ice programmes at the Alfred Wegener Institute for Polar and Marine Research (Bremerhaven, Germany), which probably eased the integration of their individual contributions. This integration is visible in many helpful cross-references between chapters.

In general, the articles present important and up-to-date information—both basic and advanced—on the nature of sea ice, sea ice processes, changes in sea ice concentration, thickness and properties, mathematical descriptions of relevant processes, sea ice ecology and measurement techniques. The selection of figures and their technical quality is generally good. Extensive reference lists after each chapter ease the search for more detailed works relating to each topic. In this respect, the reference list for the palaeo sea ice distribution chapter (Chapter 11) stands out somewhat, being about twice as long as most other reference lists in the book. As manifested in the number of recent publications on the subject, the variability of sea ice thickness and its relation to climate change is one of the most discussed and worked-on topics in sea ice studies today. Accordingly, one chapter (Chapter 3) in the book is dedicated to this topic, including modern measurement and monitoring approaches such as electromagnetics, upward-looking sonar and existing and planned satellite missions.

The glossary, which defines key terms and concepts, and an index faciliate understanding and locating issues and cross-links between disciplines and articles. Some important terms missing in the glossary (e.g. nilas) can be found in the index. Regrettably, terms appearing in the captions to the places and figures are not listed in the

index. This and some other technical inconsistencies in the index and the reference lists may disturb the reader slightly, but they do not reduce the positive impression of the book's content and its scientific quality.

With the help of the index, readers interested in particular regions can locate information about their areas of concern (e.g. 14 entries for the Barents Sea). Discussions on issues which are relevant for both physics and biology, such as the marginal ice zone and polynyas are discussed in various chapters of the book, but do not have individual chapters devoted to them. Neither is there a chapter on sea ice models in general. Such a chapter could have discussed recent models and compared large-scale models dealing with the future development of ice concentration and thickness and their connection to oceanic and atmospheric processes. However, various models appear in several chapters, for example, those for ice growth (Chapter 2) and for palaeo sea ice conditions (Chapter 11).

As G. E. Fogg writes in the foreword, the different aspects of sea ice research are linked together into a coherent picture in this book. I would recommend this interesting and enjoyable textbook for both students and scientists working with sea ice and oceans in the polar regions.