

responsible for accumulating much of the information incorporated in the book. Only then does one arrive at the table of contents. That is immediately followed by Resolution 2 (2004) of Antarctic Treaty Consultative Meeting XXVII setting out 'Guidelines for the operation of aircraft near concentrations of birds in Antarctica.' However, some of the detailed maps have nothing under the heading 'Information Sources and Dates' and when there is a space at the end of a page we are sternly informed that this is left 'Intentionally blank.' One wonders if the average user would be brave enough to use these spaces for his or her own notes. A further oddity is that the same map is occasionally printed more than once, as in the case of Paradise Harbour, one copy of which appears above a photograph of Gabriel Gonzales Videla Station with another on the next, facing, page appearing above a photograph of Almirante Brown Station. The only difference between the two is that each has its own flight approach and departure directions. It seems odd that they could not appear on the same map. A yet more curious example is at the southwest corner of King George Island. Here, of course, the bases are almost on top of one another and the same map is used for the Marsh, Bellingshausen, Artigas, Great Wall, and the Vaclav Vojtech 'Eco' bases, again with the sole difference being the arrows indicating the flight directions.

There is at least one omission. The newly discovered emperor penguin colony on Snow Hill Island is not mentioned, but this might have been because it was discovered after the book was finished. It is to be hoped that this omission will be corrected in a future edition.

A further point is that some of the aircraft approach/departure directions seem a little inaccurate when compared with the arrows printed on the maps. However, in the introduction it is stated clearly that the guide is not intended to provide technical aeronautical information and that the indications given are simply to avoid any possibility of flying over concentrations of wildlife.

All dimensions are resolutely in Imperial measurements, no doubt arising from the book's purpose as a guide for aviation. And some of the notes are positively mysterious, at least to laypeople. For example, in the case of Seymour Island/Marambio Station, we are informed that the approach is in the sector between 'N and 090. BAH 230 (to pick up running rabbit).' Whatever that means!

To sum up, a very useful, well-presented, and interesting book. (Ian R. Stone, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

GEOLOGY OF SOUTHEAST ALASKA: ROCK AND ICE IN MOTION. Harold H. Stowell. 2006. Fairbanks: University of Alaska Press. 140 p, illustrated, soft cover. ISBN-13: 978-1-889963-81-5. \$US19.95. doi:10.1017/S0032247406275995

The part of Alaska described in this book is one of the few coastlines in the world where coastal mountains adjacent

to the ocean include glaciers, or exhibit recent glaciation, and can thus be compared with the scenic beauty of southern Chile, New Zealand's South Island, and Norway. The area is very popular with cruise lines, many of which charter ships every northern summer through the 'Inside Passage.' Continental glaciation in North America began to retreat from southeast Alaska some 14,000 years ago, leaving behind spectacular evidence of the erosive qualities of glacier ice on the mainland and offshore islands. Relatively small Alpine glaciers are all that remain of this last major glacial period in Earth's history, when the thickness of ice in Glacier Bay was as much as 3000 feet (900 m).

The book is divided into eight chapters, with the first seven discussing the basics of geology that apply to the area (pages 1–58) and providing the setting for the last chapter (Regional Geology, pages 59–109), in which specific areas are described in detail. The remainder of the book includes notes (three pages), brief mentions of publications that pertain to the area described; a glossary (13 pages) of 120 geological terms that are used throughout the text; a bibliography (seven pages) of 66 entries; and an index (seven pages). A scan of authors in the bibliography illustrates the long-term study of the area by US Geological Survey geologists and colleagues. The first chapter covers the geographic setting of southeast Alaska, with the relatively warm ocean currents providing a moderate maritime climate: warm and moist air creating considerable coastal precipitation, and less on the eastern side of the mountains. The geographic area included in this book is generally from Ketchikan in the south, to Juneau, Haines, and Skagway in the north, spanning latitudes 54–58°N.

Chapter 2 — 'Glaciers, ice ages, and global change' — includes a description of the various types of glaciers (continental, Alpine, tidewater, for example), icebergs, and the probable causes of ice ages, with Milankovitch cycles (variations in the Earth's orbit) proposed as the most likely cause of Pleistocene ice ages. Numerous examples of glacial features and landforms exist in the area, exhibiting fjords, U-shaped valleys, cirques, arêtes, and striations.

Chapter 3, on plate tectonics, is a vital part of the book because of the role played by crustal movement through geologic time, with the Pacific Plate moving mainly northward in strike-slip motion against the North American plate, with a present rate of about 2.3 in yr^{-1} (5.8 cm yr^{-1}). The result over millions of years is a mixture of several different terranes, some of which are parts of volcanic island arcs that formed south of their current locations and moved north along faults before colliding with North America between 165 and 100 million years ago. Although these terranes and the general complexity of metamorphic geology take some thought to put things into place, the author has done a remarkable job of putting the processes into language for the general public to understand.

Chapter 4, on rock types, includes a basic classification of Earth materials, describing the most common

rock types in nature. My suggestion here is that a diagram showing the relationship of granite/rhyolite – diorite/andesite – gabbro/basalt would have been useful for the reader to understand the chemistry and cooling comparisons of these common igneous rocks.

Chapter 5 — ‘Faults, earthquakes, and mountain building’ — introduces the factors that have helped to shape southeast Alaska and bring its present terranes to where they are presently. Modern earthquake activity includes the landslide in Lituya Bay in 1958, in which 40 million cubic yards (30 million m³) of rock slid into the head of the bay as a result of an earthquake along the Queen Charlotte-Fairweather Fault, creating a tsunami in the narrow bay that stripped the walls of trees as much as 1800 feet (550 m) above sea level.

Chapters 6 (‘Alexander Archipelago’) and 7 (‘Coast mountains – exhumed lower crust’) discuss the various means of terrane movement and placement of the major components of the coast, including the Coast Plutonic Complex, which is subdivided into three parallel belts of similar rocks that extend the length of southeast Alaska — western metamorphic belt, central pluton-gneiss belt, and the eastern metamorphic belt. Rapid glacial erosion of mountain belts likely keeps pace with tectonic uplift, thus limiting the height of mountain belts. As an example, the landscape in Glacier Bay is currently rebounding at 1 in yr⁻¹ (3 cm yr⁻¹), possibly due to a combination of the weight of glacial removal and tectonic uplift. Chapter 8 — ‘Regional geology’ — provides details of some of the major areas in southeast Alaska, including Glacier Bay, where glaciers have retreated more than 60 miles (100 km) in the last 200 years, a reasonably well documented area of historic accounts (John Muir visited here in about 1900). Further areas discussed in respective subheadings include Haines and Skagway, at the northern end of Lynn Canal, which offers spectacular glaciated scenery; Klondike Gold Rush, where the discovery of gold in 1896 initiated a major gold rush starting in 1898; and Sitka, the oldest non-native settlement in southeast Alaska, which became the capital of Russian Alaska in 1804 and remained so until the United States purchased Alaska in 1867. Remaining subheadings include discussions of Chatham Strait; Juneau; Gold mining and the westernization of southeast Alaska; Tracy Arm, Endicott Arm, and Holkham Bay; Frederick Sound; Petersburg and Wrangell; Clarence Strait and Prince of Wales Island; and Ketchikan and Misty Fiords. It was noted that LeConte Glacier, near Petersburg, is the southernmost tidewater glacier in North America. It retreated one-half mile since 1994, with flow rates ranging between 25 and 95 feet (8–29 m) per day, contributing considerable icebergs as a result.

One-page additions within the chapters include helpful summaries of measuring glaciers, Earth magnetism as a tool for determining ancient positions of the Earth’s crust, and radioactive isotopes as a tool in radiometric dating of rocks. On the whole, the writing style and level of writing, along with the excellent diagrams, provide an

excellent reference book for passengers on cruise vessels traveling along the Inside Passage, the most-used ship and Alaska Marine Highway route from Ketchikan to Petersburg, Juneau, and Haines. The 28 color photographs add to the explanations in the text, and the numerous diagrams and geologic maps, all in colour, deserve much attention. The photographs are especially a treat for those who have been in this area and experienced considerable overcast skies, rain, and fog, obliterating the spectacular scenery. I expect that the book will be made available in the shops of all the ships transiting this area, and shops in the settlements visited. The book is basically error-free, with a single typo noted, and the alternating use of the terms ‘comprised of’ and ‘composed of’ in several instances (see amphibole and andalusite in the glossary, page 113, for example). (John Splettstoesser, PO Box 515, Waconia, Minnesota 55387, USA.)

LIFE IN ANCIENT ICE. John D. Castello and Scott O. Rogers (Editors). 2005. Princeton, NJ: Princeton University Press. xxii + 307 p, illustrated, hard cover. ISBN 0-691-07475-5. \$US45.00. doi:10.1017/S0032247406285991

Life in ancient ice results from a 2001 workshop of the same title organised by the editors and sponsored by the National Science Foundation. The book has 20 chapters, comprising an introductory and concluding chapter by the editors with 18 chapters in between that are research articles. The articles are primarily by US and Russian researchers, since these were the main workshop participants. Cryobiology is an emerging field and the research presented at the symposium and in the book was conducted largely prior to 2000. Thus, as the first compendium of cryobiological research in terrestrial systems, it provides a good starting point for those interested in the field.

An attractive aspect of the book is the diverse range of topics that are covered by the research articles. ‘Life’ is broadly defined in this volume, encompassing viruses, prokaryotes, and eukaryotes (algae, fungi, and diatoms). Similarly a broad range of icy environments are featured, including lake ice, permafrost, and ice cores from ice caps and ice sheets. The approaches and methods used in the research articles vary widely, too, including culture-based work, molecular techniques, and fluorescent sensing tools (biologgers). Given the diversity and complexity of the techniques, environments, and approaches in the book, it will probably appeal most to graduate students and researchers. However, it is also a useful resource for senior undergraduates contemplating graduate research in cryobiology, since it provides stimulus for the many different aspects of cryobiology in which one can conduct research.

The editors note and address the significant challenges that face researchers in cryobiology, especially those working with ice cores. The primary challenge is contamination of the samples with organisms external to the environment of interest. Chapter 2 provides a