

different satellite sensors. Chapter 5 discusses efforts to merge active SAR (ERS-1) and passive microwave (SSM/I, Special Sensor Microwave/Imager of the US Defense Meteorological Satellite Program) data using a 'hybrid fusion' approach. Passive microwave data (of a much lower resolution, 25 km) is mapped to the coordinates of the ERS-1, high resolution data; and, an estimate of multi-year ice concentration from the SAR data is used as a constraint in modifying the passive microwave algorithm (for ice-type concentration). The results of the fusion process are promising: initial first-year ice concentrations are significantly improved for the freeze-up season. Chapter 6 uses SAR for studies of ocean-ice interaction, particularly along marginal ice zones and within polynyas. A new method for remote sensing signal analysis, the wavelet transform, has been developed to track more effectively the ice edge, ice-floe motion, and mesoscale eddies in the ice margin.

Techniques for the automatic mapping of the seasonal transitions of sea ice using SAR are presented in Chapter 7. This chapter includes innovative maps showing the dates of melt onset and freeze-up of sea ice in the Beaufort Sea, all computed from ERS-1 data. The algorithms take advantage of a springtime drop in backscatter coinciding with rising local air temperatures; in the autumn freeze-up, the transition to a high, stable backscattering (from a period of erratic values of backscatter) is monitored during cooling. Chapter 8 is a comprehensive treatment of using SAR in the Antarctic for sea-ice studies. The Weddell Sea region is emphasised, since this is where ERS SAR missions were coordinated with field measurements. This chapter is particularly well-illustrated with clear satellite images and data plots; one highly useful plot (page 161) indicates the backscatter measurements for a broad range of ice types in the Weddell Sea. The discussions of the backscatter characteristics of sea-ice types and sections on Antarctic sea-ice dynamics will be invaluable to many investigators.

The second part of the book, in four chapters, focuses on SAR polar systems and facilities. The vision, mission, and capabilities of the Alaska SAR Facility in Fairbanks are fully documented in Chapter 9. Also included is a succinct review of the role of SAR in sea-ice research, covering the need for ice types and concentration, ice motion, and ice morphology, as well as the requirements for effective operational ice information systems. Chapter 10 includes an excellent review of the world's ice information services (US, Canada, the Baltic nations, Russia, and Japan). Key sections review manual analyses of SAR images and the combination of SAR data with other forms of information. The problems of automatic ice classification using ERS-1 data at the US National Ice Center are highlighted (examples being the over-estimation of first-year ice cover at high latitudes, and the misclassification of first-year ice in the marginal ice zone). Such practical experience from the ice centres is of critical value to remote sensing specialists developing SAR algorithms.

Chapter 11 describes the RADARSAT Geophysical Processor System in use at the Alaska SAR Facility. The system is designed to produce five key sea-ice parameters: ice motion, ice age/thickness distribution, melt onset/freeze-up, open water fraction, and backscatter histograms (for use in a variety of studies related to energy and mass fluxes in sea-ice surfaces). Each of the algorithms is discussed and the resulting products reviewed. The final chapter (12) reviews a SAR data analysis system (developed by a group in the UK led by GEC Marconi Research Centre) that has commercial applications, particularly for ice piloting of ships. The original work used ERS-1 SAR data that was analysed by algorithms for ice motion, ice type/concentration, ice edge, and iceberg recognition. The ice piloting system was tested off Greenland in 1994 and it can be adapted for RADARSAT and other future SAR sensors. The chapter also includes an informative section on iceberg detection using SAR, where three characteristics of an iceberg may be identified in imagery: the iceberg itself, an iceberg shadow (the lee of an iceberg for example), and an iceberg wake.

In summary, this volume is a valuable contribution to polar science. It is well-written, superbly illustrated, and contains a useful author citation index for most of the key literature in this field (referenced in the text). The editors are applauded for keeping to a minimum the advanced physics and sophisticated mathematics of this highly technical subject. Thus, the book is likely to become a ready reference for students as well as polar scientists of many disciplines. Since satellite SAR is such a significant tool for studying sea ice and the polar oceans, and will remain so well into the next century, the book is strongly recommended for all polar and remote sensing libraries. (Lawson Brigham, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER).

THE ROMANCE OF NIKOLAI REZANOV AND CONCEPCION ARGÜELLO: A LITERARY LEGEND AND ITS EFFECT ON CALIFORNIA HISTORY. Eve Iversen. 1998. Kingston, Ontario, and Fairbanks: The Limestone Press. vii + 176 p, illustrated, soft cover. ISBN 1-895901-22-7. \$US20.00.

The story of Nikolai Rezanov and his brief liaison with Concepcion Argüello is well-known in California, but is less familiar in other parts of the world. It has some peripheral interest for readers of *Polar Record*. In brief, Rezanov, born in 1764, was a Tsarist official who was instrumental in the formation of the Russian-American Company, which controlled Alaska until its sale to the United States in 1867. He had married the 14-year-old Anna Shevlikova during a mission to Irkutsk, but she died in 1802 after bearing two children. In 1803 Rezanov sailed in Krusenstern's ship *Nadezhda* on its voyage to the Pacific. His formal appointment was as ambassador to Japan, but on arrival there he was placed under house arrest and then expelled in April 1805. Rezanov then sailed to Petropavlovsk, from whence he proceeded to Novo-Archangelsk (Sitka). This settlement was in severe straits

due to lack of food, and Rezanov undertook to sail to the Spanish settlement at San Francisco Bay in order to obtain supplies and to do a little surreptitious spying. He arrived on 8 April 1806 and stayed for a total of six weeks. During that time he became attracted to the commandant's daughter, Concepcion, then aged 15, and asked for her hand in marriage. The problem was not age — Rezanov was 42 — but the difference in religion. However, the local priests decided to permit a betrothal and marriage contract while the matter was referred to the Pope and the King of Spain. This arrangement lubricated the wheels of diplomacy, and Rezanov sailed away with food and a proposed trade treaty. He promised to return for the marriage but died while passing through Siberia on the way to St Petersburg. Concepcion seems to have heard of his death fairly soon after the event, but, despite pressure from her family to marry, she never did, devoting her life to pious works, and eventually becoming a nun in 1850. She died in 1857.

This work is divided into three parts. The first section, by Eve Iversen, is an analysis of the use that has been made of the story by writers of fiction and poetry, such as Gertrude Atherton and Bret Harte. It also addresses the way in which subsequent writers have regarded the versions of events so portrayed as fact and have reported it as such. The fundamental point is that the writers delayed the date on which Concepcion heard about Rezanov's death and had her spending much time gazing out to sea waiting for him. For an historian, this is an interesting case study and a warning to be on guard in the use of sources or of what appear to be such. Iversen not only comments on the use made of the story by American writers, but also mentions that Russian poets, essayists, and novelists have also employed it. Here she is very slightly weaker especially with regard to the Soviet rock opera *Junon and Avos*

— *the hope*, which is loosely based upon the story. One wonders if this is the first time this particular genre has been mentioned in the review columns of *Polar Record!* She mentions that the libretto is by Andrei Voznesenskii but does not give the name of the composer (Juri Rubnikov), nor does she mention that it retains an enduring popularity in the former Soviet Union and is frequently performed. So detailed is the work Iversen has done that the bibliography for this section of the book runs to 33 pages.

The second section, entitled *The Concha Argüello story; memory visits with Old Vinnie* and written by Maurice M. O'Moore, records conversations between the author (a Roman Catholic priest) and a lady called Vincentia Salgado who knew Concepcion during her religious life. It adds little to the story but is entertaining to read.

The third section, by Richard A. Pierce, gives an outline of the life of Rezanov and of the romance, including extracts from correspondence by Rezanov himself and other witnesses of events. In the opinion of this reviewer, it would have been more useful if this section had appeared at the start of the book.

This book sets out full information on what appears to be merely a small footnote of history, and has left little more to be said on the subject. It is attractively presented and there are a number of illustrations, many of which are from works of fiction based upon the story. For those readers with interests in Alaska under the Russians, the book will be of interest, while, for the rest, its main virtue is as a cautionary tale of the way in which historical facts can be distorted and embroidered by writers of fiction, whose works then become sources for, and whose statements are reported as facts by, a new generation of writers. (Ian R. Stone, Laggan Juys, Larivane Close, Andreas, Isle of Man IM7 4HD.)