of important historic documents and short biographies of *Terra Nova*'s 19 captains. Many of these were colourful characters with lives determined by the vicissitudes of the ice. By focusing on the activities of the ship, rather than on Scott, this book even manages to uncover a side to the famous British Antarctic Expedition that is rarely appreciated today. However, it is in the least famous parts of *Terra Nova*'s story that the fruits of many years labour are revealed. In particular, there are the vivid accounts, in 'Newfie' dialect, of her days on the sealing grounds, often under the command of Captain Abram Kean. Captain Kean worked the sealing grounds from 1889 to 1936, commanding a number of sealers, including, for 10 seasons, *Terra Nova*. He became known as the 'Admiral of the Fleet,' such was his success and longevity as a captain, and despite being caught up in several Arctic disasters, with large losses of life, his commercial success gained him immense respect. He was awarded an OBE in 1934 and presented with a model of *Terra Nova* in a glass case.

Tarver has also penetrated numerous rumours to provide a comprehensive account of *Terra Nova*'s dramatic sinking, whilst under charter to ship supplies for the war effort. Previously published accounts suggested that she was sunk by enemy action or caught fire. However, these rumours have always been difficult to substantiate since any papers were thought to have been lost when the offices of Bowring Brothers were bombed during the Second World War — although this action actually predates the loss of the ship. However, published accounts by the captain and the radio operator have been traced, along with still-living eye witnesses who have given accounts of the dramatic events of 13 September 1943, when the last-but-one of the 'wooden walls' went down off Greenland.

Given this rich material, it is a pity that the writing is occasionally laborious and somewhat repetitive; however, the remarkable content of the book overcomes this. Sailor's yarns intersperse with ship logs and shipwrights' lists to form a vibrant account of a long-lost polar world of sail, steam, seal blubber, and mariner-heroes. In particular, the collection of historic photographs is superb, from those of famous days with Scott by Herbert Ponting, to an equally familiar ward-room, yet photographed with an anonymous sealing captain and his mates. Many polar books have been let down in recent years by publishers printing poor quality images, an act of laziness for which there is no excuse in our digital age. This book joins those few with high quality picture reproduction. It is richly illustrated, beautifully crafted and the sort of book that is simply a pleasure to own.

It is much to be hoped that similar histories may now appear for other famous vessels of polar exploration, for despite the difficulties of the research, Tarver has shown that it can be done. Their characters and adventures are no less riveting that those of their seafaring occupants and are often more revealing of a vanished polar age. (David M. Wilson, 71 Myddelton Avenue, Enfield, Middlesex EN1 4AQ.)

REMOTE SENSING OF SNOW AND ICE. W. Gareth Rees. 2005. Boca Raton, FL: CRC Press. xx + 285 p, illustrated, hard cover. ISBN 0-415-29831-8. £56.99; US$99.50.
doi:10.1017/S0032247406255992

This book is an excellent summary of the remote sensing techniques appropriate to snow- and ice-covered regions, image-processing techniques useful for handling these data, and physical properties of snow and ice relevant to remote sensing. It is aimed at a post-graduate level, but could be used in an undergraduate course. Indeed, although the book is specifically aimed at remote sensing of the cryosphere, it provides a good summary of the basic principles that are appropriate for all remote sensing. It is a book that would be a useful addition to the bookshelf of anyone working on the cryosphere, providing as it does an introduction to most remote sensing techniques currently in use. Because it is strongly physics based, it is likely to provide at least a roadmap for understanding future methods.

The content of the book provides good coverage of techniques in use for studying snow and ice. It covers both satellite and airborne remote sensing and active and passive sensors across the electromagnetic spectrum from visible to microwave wavelengths. There are omissions: neither satellite observations of the gravitational field (for example, the Gravity Recovery and Climate Experiment (GRACE)) nor seismic sounding are covered, although the former is hinted at on page 152. Both omissions are understandable, as the former is a new technique not primarily aimed at understanding the cryosphere, and the latter is well covered by other geophysical textbooks. Seismic sounding of glaciers is not different in principle from seismic methods used in geological settings, and has several simplifying aspects — notably that glacier ice is a remarkably pure and homogenous medium, unlike the rocks usually sounded by this technique. However, the book is focussed on remote sensing using electromagnetic radiation. As noted above, in most cases, the book provides an excellent general background to the remote sensing techniques described, equipping the reader to understand new sensors as they become available.

The book is particularly strong in the area of passive sensors of electromagnetic radiation, from microwave to optical wavelengths. The author covers the physics and practical use of such sensors in considerable detail, explaining the benefits and limitations of each technique in turn. This is especially valuable where he explains the limits on spatial and spectral resolution for each broad region of the electromagnetic spectrum.

The book is subject to one main criticism, and that is that the coverage of techniques is uneven. While the

coverage of data collection, processing, and correction for image-forming sensors is very strong, there is far less coverage of the geometric corrections required for active sensors. Although there is considerable mathematical detail for the radiometric correction of sensors, there is little mathematical coverage and only a brief description — less than a page — of the equally necessary geometric correction of satellite radar altimetry and airborne or ground based radio echo sounding. Furthermore, the book does not cover the range of techniques used to carry out these corrections, but only refers to a technique that although widely used is not necessarily the best.

The book is well organised, with chapters on the various techniques available, image processing, physical properties of various aspects of the cryosphere, and then separate chapters for sea ice, freshwater ice, glaciers, and icebergs. Examples are indexed by place-name and by general region, enhancing their utility for workers in particular areas, and giving the general glaciological setting of the example.

Critically, there is both a comprehensive index and a wide-ranging bibliography. Both are essential to its use as a reference volume, and both are comprehensive in their coverage. The bibliography will certainly provide ample material for the reader who wishes to expand his or her understanding of any particular area.

Rees has provided a useful addition to the bookshelf of any glaciologist, and it will easily take its place alongside standards such as Paterson's *The physics of glaciers*. While there are some deficiencies in the range of topics covered, these do not detract from the utility of the book, and I anticipate that these omissions will eventually be covered in a second edition. (A.P.R. Cooper, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB1 0ET.)

WILDLIFE AWARENESS MANUAL: ANTARCTIC PENINSULA, SOUTH SHETLAND ISLANDS, SOUTH ORKNEY ISLANDS. C.M. Harris (Editor). 2006. Cambridge: Environmental Research and Assessment. 136 p, illustrated, soft cover. ISBN 0-9552205-0-5. Free to qualifying polar libraries. Otherwise £15.00.
doi:10.1017/S0032247406265999

This interesting little book is the first Wildlife Information Publication to appear under the auspices of the Polar Regions Unit of the United Kingdom Foreign and Commonwealth Office. The aim is to provide 'practical information on breeding wildlife (penguins, petrels, shags, fulmars, fur seals) colony locations. . .in the Antarctic Peninsula/South Shetland Islands/South Orkney Islands region. Information on scientific stations, protected areas and historic sites is also included. The manual is designed primarily to meet the needs of helicopter pilots, with orientation maps, photographs and summary information highlighting key wildlife and landing site information.'

The information presented is remarkably comprehensive. Some 130 locations are included and for each there is a clear coloured map, at a reasonable scale, with contours, the location and type of the wildlife colonies, areas covered and uncovered by ice, the locations of any bases, areas where overflight/landing restrictions apply, Specially Managed and Specially Protected Areas, and helicopter approach and departure routes. In cases where there is a base in the area, there is an oblique aerial photograph with orientation, locations of any hazards (for example, aerials or lattice masts), and the location of any helicopter pads with an indication of their size. Radio contact information is also provided where applicable. Each region, for example, Elephant and Clarence islands, has its own overall map with the individual locations marked on it. In the case cited, these are, Seal Islands, Elephant Island west, Elephant Island central, Elephant Island east/Cornwallis Island, Clarence Island, Aspland Island, and Gibbs Island. Continuing the example, for Gibbs Island we are informed that there are some 40,000 breeding pairs of Adélie penguins at 'several colonies mostly along the southern coast,' as well as some 10,000 southern fulmars breeding on Furse Peninsula, with 7000 east of The Spit and 2000 at the west of the island.

Sufficient has already been written in this review to make it apparent that this book is useful to a much wider constituency than the somewhat narrow one for which it is ostensibly intended. For example, it should be in the library of every expedition leader on board tourist vessels, of which there seems to be an exponentially increasing number in the region under consideration. The maps are excellent and are in a much more convenient format for instant use than the usual foldout versions. A good example is that of Antarctic Sound with all the associated, and very complex, islands, an area very frequently visited by such ships. Indeed, one might go further and suggest that passengers themselves could benefit from these maps as providing a convenient medium on which to mark the progress of their voyage. The maps of individual sites would be particularly helpful for briefing passengers before landing concerning what they might expect to find when they are ashore in particular locations and for indicating those areas to which access might be prohibited, and this reviewer intends to use the book for precisely that duty the next time he is in the Peninsula area. Indeed the book is much more appropriate for this purpose than some of the commercial publications that have appeared with the aim of satisfying that market.

The book has its idiosyncrasies, some of which might result from its Civil Service origin. The format is unusual in being that of a secretarial notebook. This is, however, convenient for a book that is intended for use in the field. There is no title page as such, the first text being the usual 'waiver' of responsibility statement with which everyone is so familiar in this litigious age. And one has to conduct fairly deep investigations before one discovers the name of the Editor. This only appears, in a minute font size, at the bottom of page 3 after the introduction, references, and acknowledgements. Many of the latter are directed to the helicopter crews of HMS *Endurance* who were