

wealth Trans-Antarctic Expedition (1955–58), and was sustained during his directorship of British Antarctic Survey (as FIDS was renamed) from 1962 to retirement in 1973. Sir Vivian's earlier Antarctic books, *The crossing of Antarctica* (with Sir Edmund Hillary, 1958) and *Of ice and men* (1982) cover the Antarctic period very well. This account of the remainder of his life is no less fascinating.

Born in 1908, Sir Vivian's early years included adversities, in particular during World War I when his German father was interned. In happier times, as a Cambridge undergraduate reading geology, he was introduced to polar work on a summer expedition to Greenland led by James Wordie, formerly a member of Shackleton's second expedition. Between 1931 and 1938 he was involved in expedition work in East Africa, gaining a wide experience of travel and self-sufficiency which was to serve him well in World War II. He entered the war as a territorial subaltern and served in West Africa and Europe, latterly as a Staff Officer with Civil Affairs in a ravaged and conquered Germany. Sir Vivian's work with the Falkland Islands Dependencies Survey (in which he served for 33 years) and with the three-year Commonwealth Trans-Antarctic Expedition is covered in more detail in his earlier books, but very adequately dealt with here. A concise introduction by geologist Ray Adie, long-time colleague and former sledging companion, emphasises the scientific as well as the exploratory aspects of this work.

The narrative style is interesting, illustrations and maps are well selected, and there is an efficient index. The work is dedicated 'For my family'. Themes of travel, natural history and expeditionary work are blended into a most interesting autobiography. After so much of an eventful life, the title is particularly apt. (R. K. Headland, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

FUTURE OF ANTARCTICA

ANTARCTICA'S FUTURE: CONTINUITY OR CHANGE? Herr, Richard A., Hall, H. Robert and Howard, Marcus G. (editors). 1990. Hobart, Australian Institute of International Affairs. 338 p, soft cover. ISBN 0-7246-2528-3. AUS\$30.00.

Launched by the Minister for Foreign Affairs, Senator Gareth Evans, in August 1990, this book reproduces the proceedings of 16th National Conference of the Australian Institute of International Affairs, held in Hobart in November 1989. The authors of the 15 chapters represent a cross-section of some of the major thinkers in current Antarctic policy.

Central is the debate over the Convention on the Regulation of Antarctic Minerals Resource Activities (CRAMRA), commonly referred to as the Minerals Convention. This has split the Antarctic community into nations supporting the Convention as the best means of controlling mining and providing environmental protection in Antarctica, and those opposing it outright. Defence of the Convention is strong: Chris Beeby, the New Zealand Deputy Secretary, Ministry of External Relations, John

Heap, head of Polar Regions Section, Foreign and Commonwealth Office, UK, and Tucker Scully, Director, Office of Oceans and Polar Affairs, Department of State, USA argue in favour of the Convention's ratification. They, and others, argue that the Convention fills a potential gap in the Antarctic Treaty by providing a comprehensive framework for controlling mining, while ensuring long-term environmental protection. In contrast the Australian/French initiative supporting a comprehensive environmental protection convention which will establish Antarctica as a 'nature reserve — land of science' is outlined by Prime Minister Bob Hawke and supported by Jacques Cousteau. Hawke maintains that the initiative is not challenging the Treaty system or the operation of the consensus principle, but challenging the changing perspective of environmental responsibility. It is Gillian Triggs, Reader in Law, University of Melbourne, Australia, who then lays the groundwork for a comprehensive environmental regime. Support for a World Park is provided by Lyn Goldsworth, Greenpeace Australia and Coordinator of the Antarctic and Southern Oceans Coalition.

Bill Bush's paper is a major contribution to the debate. His analysis concludes that a strong comprehensive environmental protection regime is a viable goal at this stage and that many solutions to the contentious issues involved can be pirated from the existing elements of the Antarctic Treaty System. The Australian/French initiative has raised the profile of Antarctic conservation, possibly championing the rise of a new environmental regime. The initiative is being taken very seriously by Antarctic Treaty Consultative Parties, whose Special Consultative Meeting was convened in November 1990 to discuss the negotiation of a comprehensive system for protection of the Antarctic environment. While the book will be most useful for the academic or student, interested lay readers will find chapters surveying major issues on the Antarctic agenda including the role of science in Antarctica, sovereignty, and issues surrounding security and demilitarization. At AUS\$30 the 338 pages, including four appendices of the most important Antarctic treaties regulating Antarctic affairs, are a most important addition to the literature. In Antarctic policy issues, that seem to change weekly, the authors, editors and publishers are to be congratulated for the quick time from conference papers to book release. (Lorne K. Kriwoken, Centre for Environmental Studies, University of Tasmania, GPO Box 252C, Hobart, Australia 7005.)

AN ISLAND REVEALED

SUBANTARCTIC MACQUARIE ISLAND: ENVIRONMENT AND BIOLOGY. Selkirk, P. M., Seppelt, R. D. and Selkirk, D. R. 1990. Cambridge, Cambridge University Press (Studies in Polar Research). 285 p, illustrated, hard cover. ISBN 0 521 26633 5. £40.00, US\$65.00.

A narrow, isolated volcanic massif some 34 km long and 5 km wide, Macquarie lies across the West Wind Drift just

north of the Antarctic Convergence. Almost midway between Tasmania and Antarctica, it was discovered by sealers in the early years of the 19th century. For well over a century it was a source of fur seal pelts and the oil of elephant seals and penguins. Mawson's Australasian Antarctic Expedition 1911–14 established a radio station on the northern end of the island, and since 1948 the same area has been continuously occupied as the site of an ANARE scientific station. Macquarie is of particular interest to ecologists, whom this book will please immensely. Written by three biologists who clearly know the island well, *Subantarctic Macquarie Island* has chapters on Macquarie's discovery and human occupation, physiography and climate, origins and geology, geomorphology and quaternary history, vegetation, lakes, birds, mammals, microbiology, nearshore environment and human management. There are appendices on vascular plants, bryophytes, lichens, fungi, freshwater and terrestrial algae, marine algae, land, littoral and marine invertebrates, nearshore fishes, introduced land mammals, and the masses of sea birds and seals that make up the bulk of the island's biomass. There are black and white photographs, maps and diagrams aplenty, and the style is clear and reasonably concise.

The book raises an important point relevant to many similar islands in both polar regions. Macquarie is by any standards well-known ecologically and well protected by conservation measures. Under Tasmanian State legislation since 1933, in 1970 it was designated a State Reserve, in 1977 an IUCN Biosphere and Strict Nature Reserve and in 1978 a Nature Reserve under the Tasmanian Parks and Wildlife Act. Access is by permit only, and Tasmania seems to take seriously its responsibilities toward the island. However, the surrounding sea, on the produce of which so much of Macquarie's more spectacular wildlife depends, remains relatively unstudied, its plankton and fish vulnerable to exploitation. Perhaps the relative difficulty of drawing up protective legislation for a patch of ocean has discouraged effort. Whatever the reason, the bulk of Macquarie Island's wildlife, however well protected ashore, remains at risk while the produce of the surrounding ocean is open for grabs. (Bernard Stonehouse, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

BLUE ICE AIRFIELDS

AIRFIELDS ON ANTARCTIC GLACIER ICE. Mellor, M. and Swithinbank, C. 1989. Springfield Va., US Army Cold Regions Research and Engineering Laboratory (CRREL Report 89-21). 105 p, illustrated, soft cover.

Landing and take-off poses problems for transport aircraft in polar regions. Those with retractable wheeled undercarriages are conventionally restricted to landing either on hard-ground airstrips or on specially-consolidated ice runways. The former are possible only in ice-free areas, the latter only in the coldest regions, and both are costly to lay out and maintain to high safety standards. Ski-wheels and skis increase the range of possible landing sites, but

only within narrow limits: not every inviting-looking snowfield is safe for landing. Usually skis cannot be retracted, and their drag severely reduces cruising speed and range. Switching from wheels to skis can be done only on the ground, requiring special equipment and taking up valuable time.

The authors of this report have examined another kind of landing site in Antarctica — ablation or 'blue-ice' areas, which are smooth, extensive ice fields at all elevations, swept free of snow by persistent winds. Detectable from satellite imagery, some that are extensive and free from obstructions make splendid air strips, requiring little preparation or maintenance, and capable of taking the heaviest aircraft. Blue ice runways make it possible to fly heavy transport aircraft direct from South America, Australia or New Zealand, and land with substantial loads on a wide range of sites throughout Antarctica.

The first blue ice landing sites were investigated in the Pensacola Mountains by CRREL in the mid-1970s, for possible flights by US expeditions direct from South America. Remarkably, they were never used, and official US interest flagged. In 1986 Swithinbank surveyed sites at Wilson Nunataks and Patriot Hills, and the latter was developed for tourist flights in the following year. As this report demonstrates, official interest has again stirred; some 37 sites have now been identified and several have been investigated in detail, notably at Mt Howe and Mill Glacier in the Transantarctic Mountains, and at Casey Station and in McMurdo Sound. The authors conclude that there are enough suitable blue ice sites to provide a well-distributed system of Antarctic airfields for large conventional transport aircraft, and that costs of development should be very low. These are important conclusions, opening up new logistic possibilities and adding substantial safety margins to trans-continental flights. (Bernard Stonehouse, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

BRIEF REVIEWS

THE GREENLAND MOUNTAIN BIRCH ZONE, SOUTHWEST GREENLAND. Fredskild, B. and Ødum, S. (editors). 1990. *Meddelelser om Grønland Bioscience* 33.1990: 1–80.

A symposium of eight papers on growth and characteristics of trees and shrubs, especially native birch, in the relatively mild fjordlands of southern Greenland. An introduction by the editors is followed by papers on mapping and monitoring of woodlands and scrub in Qingua-dalen (Feilberg and Folving), hybridization, introgression and taxonomy of mountain birch in Iceland and Finnish Lapland (Sulkinoja), stomatal behaviour of mountain birch (Kauhanen), insect grazing on mountain birch in Greenland and Norway (Tenow), afforestation experiments (Ødum), nutrient ecology, vegetation and biomass of Greenlandic birch sites (Eurola, Laine and Wielgolaski) and fungi of mountain birch in Greenland (Elborne and Knudsen).