

Book Reviews

WAR NORTH OF 80: THE LAST GERMAN ARCTIC WEATHER STATION OF WORLD WAR II. Wilhelm Dege. Translated from the German and edited by William Barr. 2004. Calgary: University of Calgary Press and Arctic Institute of North America (Northern Lights Series 4). 361 p, illustrated, hard cover. ISBN 1-55238-110-2. Can\$49.95.
doi:10.1017/S0032247405214419

In October 1944 the Kriegsmarine (German Navy) established its last Arctic weather station, called Haudegen, under the leadership of Wilhelm Dege (1910–79) at Nordaustlandet, the northeastern part of Svalbard. Today it is the only still-existing station hut and a highlight of tourist cruises.

William Barr's new book presents the translation of Dege's personal narrative, which had been published under the title *Wettertrup Haudegen: Eine deutsche Arktisexpedition 1944/45* ('Weather detachment Haudegen: a German Arctic expedition 1944/45') (Dege 1954). The title changed to the more thrilling and possibly better-selling *War north of 80*, which is an allusion to the book *War below zero*, describing the American operation against German weather stations on the east coast of Greenland (Balchen and others 1944). Instead, Dege's book is an exciting narrative of his peaceful expedition. It describes the preparation and establishment of the weather station at Nordaustlandet, the overwintering during the darkness of the polar night, the final surrender four months after the official capitulation of the German Wehrmacht, and the winding up of the expedition. The author's style is typical German, with long sentences, which is very well reflected in the translation.

The book was first published in West Germany in 1954, a decade after the start of the expedition. At that stage West Germany was still recovering from the war, with new transports of prisoners of war repatriated from the labour camps in Russia. The Cold War governed the politics of those days. When a four-power conference on the reunification of West and East Germany was not successful, the USSR declared the German Democratic Republic to be a sovereign state.

Barr's book is much more than a simple translation. It provides new material, which had been deleted from the original German manuscript (chapter 2 on the wartime voyage to Tromsø and chapter 17 on a strange surrender), and supplements chapters in the beginning and the end, as well as including footnotes referring to Dege's unpublished diaries. In two appendices, Barr adds information on hostilities in Svalbard and automatic weather stations, mostly extracted from the comprehensive book about the German Arctic weather stations by Franz Selinger (2001), 'the world authority on every aspect of Germany's weather

information gathering activities in the Arctic in World War II,' as Barr calls him. Two more appendices written by Dege's son, Eckart, describe the life of the participants after Haudegen and give a report of an expedition to the Haudegen site in 1985, first published in 1986. Finally the younger Dege gives a list of 32 new place-names given during the Haudegen expedition, of which 19 had already been named or were renamed later by the Norwegian authorities. He also supplied all the maps and 31 pictures, among some unknown photographs, whereas the original book had been illustrated with 42 pictures. Five of the eight maps had been already published in Selinger's book, to which, surprisingly, no reference is given.

In his introduction, Barr focuses on the weather war and gives a detailed survey of the German Arctic weather stations established during the period of 1941–45. The meteorological observations were highly in demand in order for the German war effort to control the British and American convoys to Murmansk and Archangel'sk, after Germany had invaded the Soviet Union in June 1941. Due to this, Svalbard was of special strategic importance. At that time, the weather data used by the western Allies were not available in Germany, so they had to be provided by their own weather detachments. The Kriegsmarine was the first to react, placing a weather ship in the northern part of the Greenland Sea. Later, manned stations on Svalbard, the east coast of Greenland, and Franz Josef Land were established. The Luftwaffe worked independently of the Kriegsmarine, installing very small weather detachments of only two to four men. For reasons of secrecy, each Navy station received a special name as a play on the expedition leader's name. 'Haudegen,' for example, was derived from Wilhelm Dege, although the entire word 'Haudegen' means 'broadsword' or 'warrior.'

Reading the narrative allows the reader to enter a world of adventure that contrasts highly with the cruel world of war. The 12 members of weather detachment Haudegen, with a mean age of 21 years, were excited to go to the Arctic, while their comrades had to go to the front. In January 1944, a year after the capitulation of the 6th Army in Stalingrad, they passed a special training in the Riesengebirge at the border of the Czech Republic and Poland, and in the Alps. Even when the Allies invaded Normandy on D-Day, the training continued. Dege had been astonished about the amount and value of the 80,000 kg of provisions and equipment available for his expedition. Together with the costs for the expedition ship and the operating costs of the escorting U-boat, it amounted to almost double the costs of Alfred Wegener's final expedition to Greenland (1930–31). This gives a measure of the importance of the Arctic meteorological data. The expedition started on 4 August 1944 and established the prefabricated station in Rijpfjord

(Nordaustlandet), while Dege, aboard the U-boat, accomplished a circumnavigation of the island. An additional sauna and laundry hut was built from abundant lumber of wooden boxes. The reader follows Dege's personal concerns about the men entrusted to him, his descriptions of joyful leisure time filled with exploring the surroundings and hunting, playing music and singing, as well as lectures and reading during the long winter night. There was uncertainty of the future after the German capitulation and they had a very strange surrender to a Norwegian skipper who had been entrusted by the Norwegian Navy Command. Finally Dege is followed through different prisons in Norway, where he had the opportunity to evaluate his meteorological data and to prepare a geomorphological overview of Nordaustlandet, then mostly unknown. The younger Dege's additional description of the fate of the Haudegen people up to the present is very interesting, especially in respect of different lifestyles developed in West and East Germany.

There are some minor problems. The single page provided for the contents is not enough to give a great deal of information, due to which the detailed index (instead of three pages of the original German book) is not mentioned. Also a list of figures and maps has been dropped from the original. Instead a glossary gives the equivalents of German naval ranks to British and US ranks. Sometimes the description on the maps is not readable without a magnifying glass, as on the general map of Svalbard (page xii), or the printing of the map title is defective (page xxv).

Despite these minor technical deficiencies, this book can be highly recommended for anybody interested in the German activities in northeastern Svalbard during World War II. Due to the new chapters, further supplements, and appendices, it is also interesting for those who already know the German edition. (Cornelia Lüdecke, Centre for the History of Science, Mathematics and Technology, University of Hamburg, Germany.)

References

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NEW OWNERS IN THEIR OWN LAND: MINERALS AND INUIT LAND CLAIMS. Robert McPherson. 2004. Calgary: University of Calgary Press and the Arctic Institute of North America. 420 p, illustrated, hard cover. ISBN 1-55238-097-1. \$Can49.95.
doi:10.1017/S0032247405224415

Robert McPherson's career as an exploration geologist took him frequently to the Canadian north. From 1989 to 1991, he served as a consultant to Inuit representatives in

land-claims negotiations. This book is his sympathetic portrayal of the situation of Inuit in the central and eastern Arctic in the 1950s and 1960s, pressures by mining companies on lands used by the Inuit from 'time immemorial,' and the process and outcome of land-claims negotiations stretching from the 1980s to 1992.

The book follows a topical and chronological order. The first chapter discusses events in Keewatin, a district in the eastern Arctic with abundant mineral resources. It examines changes in community life at the virtual cessation of trapping, and illustrates the impact on Inuit of the opening of a nickel mine at Rankin Inlet and its closure in 1962. The chapter also considers government relocation of part of the Inuit population, and the growth of active community leadership from the initial vehicle of community councils.

The second chapter treats pressures by mining companies to explore for scarce minerals in the Arctic. Exploration began in the 1890s, accelerated in the 1920s, and expanded again in the 1960s, the greatest period of attention in Canadian Arctic history. Canadian law gave companies a 'right to explore' for Crown minerals in most of the territory. Exploration and mining activities were catalysts to Inuit self-determination.

Chapter three surveys the rise of Inuit political organizations. The earliest group, the Indian Eskimo Association (IEA) was formed in 1960 by non-natives who sought to assist the mobilization and organization of the Inuit and provide needed research for the land-claims effort. IEA faded from the scene in 1978 when these objectives were accomplished. The Inuit Tapirisat of Canada (ITC) formed in 1971. It connected representatives from the western and eastern Arctic and northern Quebec whose goal was to represent all of Canada's Inuit. The chapter briefly discusses the founding of the Committee for Original Peoples' Entitlement (COPE) in 1970 and the Berger inquiry into proposed development of a gas pipeline in the Mackenzie Valley, as well as opposition to the polar gas pipeline proposal, because of fears it would threaten native lifestyles. The chapter examines early land-claims proposals of COPE and the first litigation of the Inuit on land rights issues, the Baker Lake case, the result of which acknowledged aboriginal title, but found that evidence of adverse impacts on caribou was insufficient to enjoin mining.

In chapter 4, McPherson describes development of the Nanisivik zinc mine at the north end of Baffin Island. Operating from 1976 to 2002, this mine set a model for amicable company–community relations, notwithstanding the reluctance of the company (and Canadian government regulators) to consult with Inuit while planning the project. Most Inuit workers adapted well to the requirements of industrial employment, and cash wages buoyed family welfare and facilitated subsistence pursuits.

Chapter 5 sets the background for final land-claims negotiations. The ITC in 1979 proposed the separation of Nunuvut from the Northwest Territories, marking its boundaries as the eastern Arctic and regions north of the

tree line. An alliance of Inuit organizations formed the Tungavik Federation of Nunavut (TFN), and it became the land claims-negotiation agent. At this time COPE negotiators reached closure on the Inuvialuit Final Agreement for the western Arctic. This agreement 'was the first in Canada to include land ownership, both surface and subsurface, in fee simple absolute title, including the beds of water bodies' (page 139) held by native corporations with limited conveyance rights. It was a radical departure from the James Bay agreement of 1977, which granted native ownership only to 1.3% of traditional lands and excluded mineral rights. The Inuvialuit agreement gave natives 34.6% of the traditional land or 22.6% of the traditional land and water, and \$45 million in cash. This settlement hastened resolution of the Nunavut land claims. The process quickened when government task-force recommendations (the Coolican Report) of 1986 proposed changes to the government's negotiating posture. Specifically, the task force recommended promotion of native self-governing institutions and granting secure rights to lands with resources encouraging development (page 144). Negotiation led in 1990 to an agreement-in-principle, which established the amounts of both surface and subsurface lands for the Inuit.

Chapter 6 chronicles the mining-exploration activity occurring concurrently with land-claims negotiations, and displays the nature of relationships between the mining companies and the Inuit. Typically, they were indirect, because the companies preferred to work through government agencies. In the agreement-in-principle, the Inuit consented to respect third party (company) rights specified by the Canada Mining Regulations. Companies, in turn, increased their activity to insure that their mineral claims remained in good standing, as the claims would fall into Inuit hands were they to lapse. Of particular concern was the proposal to develop the Kiggavik uranium mine. This drew objections — environmental, economic, and even moral — from environmental groups and Inuit. More than 90% of residents at the proposed site — the Baker Lake community — voted against its development, and the project was suspended.

Chapter 7 is the heart of McPherson's study and is based on his personal involvement in the final stages of negotiation. In an almost blow-by-blow narrative, he describes the members of the Inuit team, their interactions with the different native communities, and the difficult stages of negotiation. Initially, the government objected to Inuit subsurface ownership of mineral deposits that were already patented, and it wanted access rights from Inuit areas to Crown lands. The Inuit sought the most valuable mineral lands, knowing that community economic futures were dependent on nonrenewable resource development. Also, communities had different subsistence and natural resource endowments, adding tension to the process. A final compromise, including concessions by the government on subsurface lands, brought negotiations to a close in 1992.

The final chapter summarizes the land-claims agreement. In exchange for surrender to the Crown of aboriginal

title to lands, waters, and the offshore, the Inuit became legal owners of 137,450 square miles of surface (87.9 million acres) and 14,475 square miles with subsurface mineral rights (9.2 million acres), making them the managers of 'the largest block of mineral lands' in Canada (page 273).

The strength of McPherson's book is its description of the mineral lands in Nunavut and their potential for development. On occasion, his use of geological terms goes beyond the vocabulary of the general reader, such as 'radioactive pegmatite occurrences along the contact between granite and gneiss' (page 43). Yet he writes convincingly about the impact of exploration and mining on northern native communities.

The writing style is conversational, with a tendency to list people and environments without giving one much of a sense of either persons or places. A larger problem is lack of analysis of the land-claims process and outcomes. What, for example, explains the agreement on the size of surface and subsurface quanta? What major forces prompted changes in the government's negotiating position? How much bearing did other native claims in Canada (and Alaska) have on the process and outcome? What does the decade since the Nunavut land-claims agreement tell about its efficacy? These criticisms aside, McPherson has made a fine contribution to our understanding of the role of minerals in the creation of modern Nunavut. (Jerry McBeath, Department of Political Science, University of Alaska Fairbanks, Fairbanks, Alaska 99775, USA.)

AUSTRALIAN ANTARCTIC SCIENCE: THE FIRST 50 YEARS OF ANARE. Edited by Harvey J. Marchant, Desmond J. Lugg, and Patrick G. Quilty. 2003. Kingston, Tasmania: Australian Antarctic Division. x + 622 p, illustrated, hard cover. ISBN 1-876934-05-0. £35.00.

doi:10.1017/S0032247405234411

This volume has been edited from a series of presentations made in 1997 at a symposium in Hobart to celebrate the first 50 years of continuous Australian research in the Antarctic. An important volume, it attempts to take stock of the work of hundreds of scientists and the billions of dollars spent on Antarctica by the Australian government. In 21 chapters, plus the obligatory addresses from the Governor of Tasmania and Senator Ian Macdonald (then responsible for Antarctic affairs in Canberra), the various authors have attempted to highlight the principal Australian achievements in their disciplines, look at the contribution in the overall context of Antarctic science, and suggest what the future might hold. John Heap, then director of SPRI, was invited to give two papers to provide an outsider's perspective on the scientific achievements. The then chief scientist of ANARE, Pat Quilty, provides three papers, whilst the first director of ANARE, Phil Law, provides an historical account of the development of the research programmes. When faced with reviewing a volume like this, which covers

science from the outer atmosphere to medical research, from the ice sheet to microbiology, no one scientist can claim adequate expertise across all fields. This review will therefore inevitably be partial in its comments.

The choice of John Heap as the outside voice at the meeting, an ex-diplomat rather than one of the major international Antarctic scientists like Gottfried Hempel, Richard M. Laws, or Olav Orheim, seemed an unusual choice by the Steering Committee. His opening chapter about the 'scope of Antarctic science' attempts to define what sort of science is worth doing in Antarctica, if logistics defines the science, and how one can decide if the output is indicative of 'scientific excellence.' His conclusions — that we need the science, the continent is grossly understaffed, and that co-operation is crucial — are hardly a surprise. Perhaps he missed an opportunity here in not drawing out more clearly the political imperatives that underlie all Antarctic activities and are especially pertinent in Australia, as the nation with the largest sovereignty claim. There is a curious comment about SCAR and its role in terms of the Protocol and the Treaty. Why he believes that environmental management should be somehow outside the interests of SCAR when conservation science in Antarctica was pioneered and developed by SCAR is a mystery to me.

The second chapter, by Philip Law on 'Developing ANARE research programs,' provides an important insight into the levels of political interference and the lack of appreciation of the scientific value of Antarctica that bedevilled his time as director.

Pat Quilty lays out in chapter 3 what he calls the ANARE perspective of Antarctic science. In it he briefly outlines some aspects of the task facing Australia in researching the 5 million km² of Australian Antarctic Territory. He also hints at the level of political change and interference that have endlessly reviewed the programme and shunted it from one government department to another, echoing in another way the theme raised by Law about the lack of understanding by government and many politicians of the value of science.

Chapter 4, by Ken McCracken and others, sketches in the way technological innovation opened the door to new scientific opportunities, from satellites to Automatic Weather Stations. What is not especially clear in this chapter is what the Australians invented, what they developed, and what they simply applied to new problems. Their expectations for the future are all already implicit in the plans for many nations for the next 10 years and the conclusion that major changes will probably result from the opportunistic application of new technologies developed for other purposes underlines the lessons of the past.

Chapter 5, by Marc Duldig, deals with cosmic rays and astronomy, the former a field to which the AAD has contributed some important advances by maintaining a well-calibrated observatory at Mawson for almost 50 years. Fundamental to this achievement has been the linkage with university scientists and the opportunity to look for

cycles and unusual variations in a long-term data set. The section on astronomy is largely a description of why the Antarctic is especially suitable for this work and some details of more recent trial installations of Australian instruments at South Pole Station. The cost of major astronomical installations on the plateau is clearly so high they will have to be co-operative ventures between major Antarctic nations if they are ever to come to fruition.

Medical research in the Antarctic has always been Cinderella science, an adjunct to health care programmes and rarely considered important enough by national operators to receive adequate funding. In chapter 6, Des Lugg describes the interesting history of probably the best organised and funded medical research programme in the Antarctic. Sadly, a number of projects were not written up and, of those that were, many were published in ANARE publications rather than the main journals and are thus largely lost to anyone unfamiliar with Antarctic science. Lugg lays out very clearly the constraints on medical research and draws attention to the useful lessons it has contributed to space medicine. He also returns to the question of government reviews of the AAD, noting there were 19 in 30 years! Many of his comments on research results leave interesting questions hanging. For instance, the relationship between melatonin and depression, the changes in testosterone levels, and diminished immune functionality cry out for further work.

Neil Streten's chapter 7 on Antarctic operational meteorology again shows one of the strong elements in the AAD programme. The chapter focuses more on processes leading to forecast delivery than research, but clearly demonstrates why this field has been seen as a priority by government. In some respects it is a less complete overview than is provided for other fields, as Streten specifically excludes the research on regional meteorology, physics, and chemistry of the atmosphere undertaken by CSIRO, universities, and the Bureau of Meteorology. His complaint about the current lack of upper-air soundings by most nations echoes a real general concern that funding for this is difficult to obtain and maintain, yet direct measurement is vital for improving forecast accuracies.

Chapter 8, by Phil O'Brien and others, deals with the Southern Ocean and the continental shelf from a geophysics point of view. Chapter 9, by Ken Collerson and others, describes the Australian contribution to understanding the geological evolution of East Antarctica. And chapter 10, by Pat Quilty, deals with solid Earth geophysics. These geoscience chapters (especially chapter 9) are harder going for the non-specialist, with more technical terms than elsewhere. The geological research begun by Mawson has been a key component of the AAD programme since its inception, and the Australians have clearly made important contributions to the understanding of Gondwana evolution. Their recent activities in mapping the continental shelf, although driven by political objectives under UNCLOS, will undoubtedly provide much useful scientific data.

Chapters 11 (Terrestrial biology, by Pat Selkirk), 12 (Aquatic microbiology, by Harvey Marchant and others), and 13 (Krill, fish, birds, and mammals, by Knowles Kerry) comprise the biological focus. Selkirk updated her chapter in 2002 and presents a very brief overview with no examples of data as illustrations, a feature of most other chapters. If readers conclude from this that there has been little research in terrestrial biology, they would be wrong, as her earlier book on Macquarie Island showed. Interestingly she is the only author to make comment on the way in which the gender balance has changed from male-only to equal opportunity. Marchant's chapter is succinct yet very clearly drafted to summarise the efforts principally of the last two decades, when microbiological research assumed a renewed vigour driven by a small number of people with good ideas. It is not clear to the non-specialist how important this work has been, but hidden in the extensive bibliography are papers that described previously unknown food webs, that characterised metabolic processes and habitats for the first time, and that began to explore Antarctic microbial biodiversity in ways since followed by others.

Kerry notes at the start of his chapter that he does not attempt to be inclusive, but has selected investigations that have remained important over many years and research that affected government policies. His account is especially helpful, as he indicates why Macquarie Island was the initial focus of AAD biological research, the importance of the role played by Robert Carrick and his pioneering long-term studies on vertebrate population dynamics, and the rapid development of marine biological research in response to the international initiatives of BIOMASS and CCAMLR. Australia rapidly caught up with other countries, and marine biology is now one of the principal strengths of the AAD.

By now the reader is only halfway through the volume! There are two very substantial chapters of more than 80 pages each on the Antarctic ice sheet, by Bill Budd, and physics of the middle and upper atmosphere, by Pene Greet and others. There are also chapters on sea ice by Ian Allison, Southern Ocean processes by Steve Rintoul and others, mapping and geodesy by John Manning, and environmental science by Martin Riddle and Paul Goldsworthy.

Glaciology has been a key research area of AAD since before IGY, and Budd ably describes the complex and expensive fieldwork that has provided comprehensive characterisation of much of the East Antarctic ice sheet, and critical information on physical properties of ice crucial to modelling dynamic change. He makes clear throughout the paper that the role of SCAR has been crucial in providing the framework for international synthesis so important in developing the continent-wide picture. The key role played by Budd himself in developing Antarctic glaciology over more than 30 years is clearly demonstrated in the bibliography.

Allison is another Australian scientist whose research has provided international leadership in the field of sea ice

and ice shelves. Apart from the early studies of Weller and Schwerdtfeger, this programme did not really begin until the late 1970s but expanded significantly in the 1990s with the acquisition of *Aurora Australis* and the establishment of the Institute of Antarctic and Southern Ocean Studies at the University of Hobart as a partner in the research.

Atmospheric physics began in 1947 on Heard Island and has continued ever since, always occupying a major role in AAD research. As a biologist I find it difficult to be clear on the contribution the physicists have made, but the research initiated by Keith Cole and Fred Jacka appears to have had significant impacts on theory whilst the long-term data sets collected by Australian scientists have proved a crucial international resource. What becomes clear from this chapter is the very productive way in which the diverse fields of physical research have, from the start, been based on very productive co-operation between the AAD, universities, and government research institutes.

Mapping Australian Antarctic Territory, an area two-thirds the size of Australia, has been a major achievement by any standards. Manning summarises the range of tools used in the past and the challenges remaining for the future, noting in passing that ANARE staff have chaired the SCAR Working Group on Geodesy and Geographic Information for 40 years, a testimony to Australian leadership in this field.

The final science chapter describes the latest core-science initiative on environmental management and monitoring for human impacts. Riddle quite rightly points out that this work has been going on under other guises for many years but is now much more visible as a response to the requirements of the Protocol. Although he does not make it clear in the paper, the creation of a specific group to focus on human impacts research was a novelty in the Antarctic and has provided Australia with a sound basis for decision-making in environmental management.

Since the meeting was held, Australia has conducted a foresight analysis for future strategic science directions, and new programmes for 2005 onwards have been outlined that incorporate many of the elements Pat Quilty discusses in the final chapter. An interesting suggestion by Quilty is that more needs to be done to provide for historical and policy research, not in the AAD but in a university department to emulate the outputs of the Scott Polar Research Institute.

There are some niggles about the volume. It is not clear why the chapters are not numbered, making reference to them in this review more difficult! The order of chapters also seems rather strange, with medicine sandwiched between cosmic rays and meteorology, environmental science disconnected from biology, and so on. It would have been nice to see the volume published more promptly after the original symposium to capitalise on the anniversary, but it is good to see such a fine volume in the end (although the odd Americanism creeps in here and there). There are some significant differences in how the papers are laid out, with no abstracts for five of the papers (including one by an editor) and a

detailed appendix to chapter 16 listing all the scientists who worked on the programme but no such list for any other field. Perhaps more surprising is the lack of any paper looking at the bibliometrics of output and also how the work has provided links to government policy (with the exception of Kerry's comments on CCAMLR). There is, in general, no indication of why specific subjects were chosen for research or why there were changes in the resourcing of each of them with time. And it is hard for the general reader to work out what of the material described was really ground-breaking at a regional or global level. What *is* clear is that during the past 50 years Australia has produced a series of Antarctic scientists of international standing, whose research and international efforts at collaboration have had a major impact.

With a good index, this volume of 622 pages is a treasure trove of detailed information, but much of the writing is only accessible to the specialist. How much better it would have been if the papers had been written at a *New Scientist* level, comprehensible to all. Why not commission a science writer to produce such a book from the material already written? In publishing the volume itself, the AAD has produced a high-quality product but without an adequate marketing network. Using an arrangement with a university press or other commercial publisher in Australia to advertise and market the book widely outside both the Antarctic community and outside Australia would have made this history more widely known. At present few people seem likely to find out about the book.

Australia has a great deal to be proud of in its achievements. The value of many of the directors of the AAD in insisting on quality science when all the politicians wanted was occupation of territory is amply validated by this history. The very substantial investment in building and maintaining the research stations may well not have appeared cost-effective at times, but in many areas of Antarctic science Australia has been innovative, determined, and led by men of substance, resulting in its position today amongst the leading Antarctic nations. (D.W.H. Walton, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET.)

RUSSIANS IN ALASKA 1732–1867. Lydia T. Black. 2004. Fairbanks: University of Alaska Press. xv + 328 p, illustrated, soft cover. ISBN 1-889963-05-4. \$US29.95. doi:10.1017/S0032247405244418

There has long been a singular lacuna in the bibliography of works on the history of Alaska, and this is an overall and detailed account of the activities of the Russians in that part of North America. The present book is an attempt, and in the opinion of this reviewer, a spectacularly successful and fascinating one, to remedy that deficiency. It is based upon a lifetime of scholarship and upon a thorough knowledge of the Russian sources.

The author notes that the stereotypic view of the Russian period is one of 'unbridled exploitation... of Native peoples, and wanton rape and robbery of Alaska's natural resources' (page xiii). She notes that this view originated in the work of Hubert H. Bancroft and William H. Dall, who were prejudiced by the fact that they wanted the territory to become 'American' with the minimum of delay, and that depreciation of the Russian efforts might assist this process. She goes on to comment that this view started to be challenged towards the end of the nineteenth century but it appears that it is still not unknown today, at least in uninformed quarters. This work sets out a sympathetic and fresh synthesis, with many new interpretations, of the activities of the Russians in Alaska: 'their motivations, views of life and attitudes.'

The book presents a detailed account of the 'discovery' of Alaska by Mikhail Gvozdev in 1732 and Vitus Bering in 1741, with comment on numerous other expeditions and voyages. It then passes on to the period 1743–63, when there was no government interest in the territory at all and during which further exploration and establishment of the first settlements were conducted by entrepreneurs, who eventually became organised into a few powerful companies. The 'reign' of Aleksandr Baranov is the main subject of three chapters, and the account makes clear the central position of that individual in the history of the territory. The author also goes far to clarify the confused record on the question of Nikolai Rezanov, revealing him to have been a consummate self-publicist. She also points up Rezanov's role in the 'raids' of Nikolai Khvostov and Gavriil Davydov on Japanese settlements in Sakhalin and Iturup in 1806 and 1807, which were, not surprisingly, instrumental in poisoning relations between Japan and Russia for many years. The next period is that leading up to the establishment of the Russian-American Company, which was granted a monopoly, but which also had onerous requirements laid upon it by the state with regard to the welfare of its employees. There also were stipulations that would be categorised nowadays as paternalistic but that were then very enlightened, at least in comparison with the operations of other colonial powers, concerning the Company's relations with the native peoples. The author comments in detail on the position of the 'creoles' in Russian society and indicates that their position depended solely on their formal 'rank' and not on racial background. Moreover, realistic policies were adopted concerning the exploitation of natural resources. The harvesting of marine fur-bearers on what would now be called a sustainable-yield basis was introduced by Baranov and firmly established under Wrangell. One of the aspects of Russian involvement in Alaska, which the author describes in detail, is the activities of the Orthodox Church. The final section of the book, in a chapter evocatively entitled 'And the flag was ordered down,' concerns the take-over by the United States. The author notes that 'Russian citizens had little to celebrate and much to fear' at that time due to the behaviour

of some Americans who had arrived in the territory before the transfer and who had, for example, prematurely staked claims to land. She comments that church property, in particular, was lost 'without compensation both to government agencies and to private individuals and institutions' (page 286).

The text alone of the book would be sufficient for it to become a 'standard' work on the topic but the illustrations occupy a position of importance in excess of that usually the case in such works. The author notes that the publication of the book was assisted by a grant from the Rasmuson Foundation. This has obviously enabled the inclusion of so many contemporary illustrations that they lend an almost antiquarian, even luxurious, 'feel' to it. Eighteen of these are in colour and they are collected together at the beginning. One is in a fold-out format. We have, for example, the charter of nobility granted by Catherine the Great to Sven Waxell, who survived Bering's second expedition and who was instrumental in returning the other survivors to Kamchatka, drawings of the way of life of the Aleuts prepared by Mikhail Levashov in Unalaska in 1768–69, and Japanese illustrations of the stay of the Laksman-Lovtsov expedition to Hokkaido in 1792.

There are no fewer than 95 black-and-white illustrations interspersed throughout the book. The scene is set by portraits of the Tsars and Tsaritsas, starting with Alexis, Tsar from 1645 to 1676, and most of these will be familiar to readers. But many of the other illustrations will be new. Some are maps or charts, including a beautiful one of Mednoi (Copper) Island from 1755 and one compiled by Governor-General Soimonov based upon Bering's second expedition but including information from Gvozdev's expedition. There are several views of the settlements in Alaska at different stages in their development, and the diminutive size of these settlements serves to remind the reader that the total Russian population of the territory was seldom more than 500. Further illustrations include portraits of various personages referred to in the text. In particular, one would wish to draw attention to that of Baranov, painted by Mikhail Tikhanov in 1818, in which the complex character of that individual is manifest.

So overwhelming is the depth of knowledge displayed in this book that one feels reluctant, and that it is even churlish, to attempt any criticism. This reviewer would have welcomed more discussion of the relations of the Russian-American Company with the Hudson's Bay Company, especially with regard to the details of the agreement between them, under which, *inter alia*, the latter provided the former with foodstuffs at non-commercial rates. George Simpson, who was instrumental with Ferdinand von Wrangell in concluding the agreement, only appears in the index twice and yet his good offices with regard to the Russian-American Company assisted in maintaining it for many years.

A further point is the absence of specially drawn maps of Alaska and eastern Russia with the places referred to in

the text marked upon them. The author may have taken it for granted that readers would be familiar with the detailed geography of the area but this might be a little optimistic. It should be pointed out that there is a map, much reduced from the original, of the Russian possessions on the shores of the Eastern (Pacific) Ocean in 1861, and this would serve the purpose were it not too small and in Russian.

The critical apparatus of the book is impressive. The bibliography covers 24 pages and very many of the entries relate to Russian sources. There are comprehensive footnotes throughout. The presentation of the book is in full accord with the usual high standards of the University of Alaska Press. The author, the publishers, and the Rasmuson Foundation deserve our thanks.

Overall, a first-rate book at a most reasonable price, and anyone with even a peripheral interest in Alaska should read it. (Ian R. Stone, Laggan Juys, Larivane Close, Andreas, Isle of Man IM7 4HD.)

ARCTIC ENVIRONMENT VARIABILITY IN THE CONTEXT OF GLOBAL CHANGE. Edited by Leonid P. Bobylev, Kirill Ya. Kondryatev, and Ola M. Johannessen. 2004. Berlin and Heidelberg: Springer. xliv + 471 p, illustrated, hard cover. ISBN 3-540-43458-5. £107.50; US\$169.00; EUR 139.95. doi:10.1017/S0032247405254414

Models that predict the response of the global climate to increases in the concentrations of greenhouse gases (GHGs) indicate that the world will experience a trend towards increasing temperatures, and that this trend will be enhanced in the Arctic. The Arctic is a good place to look for the fingerprints of global climate change. Ozone concentrations in the Arctic have decreased by about 6% per year since 1979, not as rapidly as in the Antarctic but well above global average. The Arctic is also a region the importance of which to the climate system outweighs its size. To take one example, it is (together with the Antarctic) an unusually *white* part of the world. Much of it is covered by snow in winter, and snow reflects something like 90% of the Sun's radiation back into space, compared with the global average of about one third. If the Earth had no snow, or if snow were black instead of white, it would be a warmer place. To take another example, cold, dense water originating from Arctic sea ice is a major driver of the global oceanic circulation system that is responsible for the warm water in which northwestern Europe is bathed. However, from the environmental point of view, if no other, the Arctic is a complex and dynamic region, and natural environmental variability is large. It is thus of great importance to understand this natural variability, and to assess the evidence for man-made perturbations to the system against the background of this variability.

The origins of this book lie principally in four recently completed international research projects, with a strong Russian component, that were coordinated by Professor

Johannessen. These projects were focused primarily on the role of sea ice, and there is consequently a rather strong flavour of sea ice to the book. Nevertheless, the editors have sought to broaden the coverage into a more balanced treatment of the Arctic environment. I am not sure that this balance is fully achieved: out of more than 400 pages of main text, only 15 are devoted to snow cover and about 38 to terrestrial vegetation.

Chapter 1, 'Arctic climate change,' reviews what is known about the natural variability of Arctic sea ice and serves as an introduction to the whole book. Sea-ice variability is high, but data from satellite remote sensing show a significant decrease in ice extent during the last quarter century. The balance of evidence is that this recent trend is man-made. Chapter 2, 'Arctic atmosphere,' is also largely a review. It discusses, at length, variations in the gaseous components, including ozone and aerosols, clouds and their effect on radiation balance, and atmospheric circulation. Chapter 3, 'Arctic Ocean and sea ice,' is partly a review but also presents a new, century-long, dataset on sea-ice extent and a new analysis of ice thickness, which indicates that it has decreased by about 10 cm during the last 20 years. Chapter 4, 'Air–sea interactions in the presence of the Arctic pack ice,' focuses primarily on the upper ocean. This chapter differs from the first three in being primarily a presentation of new research results rather than a review. The dataset is an interesting one, based on meteorological data collected from Soviet drifting ice stations from the 1950s to the 1980s, and the analysis points to inaccuracies in the usual parameterisations of Arctic sea ice used in climate models.

Chapter 5, 'Land surface processes,' is divided into five sections, with different authors, treating snow cover, glaciers, the Greenland ice sheet, the forest–tundra ecotone, and river outflow. The section on snow is a review, essentially for the whole of the Northern Hemisphere. The section on glaciers is also a review, but confines its attention to Russia. A short section presents new research results from the analysis of radar altimeter data from the Greenland ice sheet for the period 1992 to 1999. The average ice thickness has increased by about 4 cm per year, and is strongly correlated with the North Atlantic Oscillation. The next section, on the dynamics of the forest–tundra ecotone, also presents the results of new research. The geographical focus is narrow, being based on two test sites in Russia. The results show the expansion of forest into the tundra. The last section of this chapter also describes new research, in this case into variations in the outflow of six major Russian rivers. Data from the 1930s to the present day show that the runoff from most rivers has increased during this period.

Chapter 6, 'Arctic Basin pollution dynamics,' returns to the marine environment. This chapter describes the results of new research into modelling the fate of industrial pollutants making their way into the Arctic Ocean. It also considers the dynamics of the carbon cycle. Chapter 7, 'Arctic marine ecosystems,' also presents the results of recent research, including the analysis of data collected

from Soviet drifting ice stations since the 1970s. Observed changes in the ecosystem are related to changes in the structure of the upper ocean itself. Finally, chapter 8, 'Regional change analysis: north-western Russia,' returns to the land surface. This is a short research chapter with a geographical focus on Karelia and Kol'skiy Poluostrov, combining data on air temperature, hydrology, and dendrochronology from the late nineteenth century onwards. Natural variability is shown to be high. The authors present a number of scenarios of regional climate change.

The book has 28 contributors and three editors. Books with as many contributors as this tend to read like collections of distinct chapters rather than as a continuous narrative, and the present work is no exception. This is not in itself a problem (although it does almost inevitably lead to a lack of uniformity), since the chapters are linked by the thread implied by the title, and the editors have contributed a lengthy and helpful preface that sets the chapters in context and summarises their main conclusions — where there are any — or at least describes their scope and approach. As can be seen from the outline of the contents in the preceding paragraphs, some chapters are primarily reviews while others mainly present new research results. Roughly half of the material falls into each category, and this is, in my view, a virtue of the book since it provides a good balance between the 'big picture' and some very detailed case studies. The technical level of the book varies between chapters (between sections, even, where they have different authors) and is, on average, fairly high. The standard of production is good, too, as expected from this publisher. My only complaint, and it is more of a grumble really, is the lack of balance between the marine environment and others. (Gareth Rees, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

WRITING GEOGRAPHICAL EXPLORATION: THOMAS JAMES AND THE NORTHWEST PASSAGE, 1631–33. Wayne K.D. Davies. 2004. Calgary: University of Calgary Press. xvi + 318 p. illustrated, hard cover. ISBN 1-55238-062-9. \$Can49.95.

doi:10.1017/S0032247405264410

In 1704, the Churchills' *Collection of voyages and travels* (Churchill and Churchill 1704) included directions for 'far travellers . . . drawn up by Mr Rook, a Fellow of the Royal Society.' Those far travellers — the word 'explorer' carries with it conceptual baggage that would have been mystifying to the late seventeenth century, though the Royal Society's work is the seed of the assumption that to travel simply to find out, not for any commercial motive, is justification enough in increasing numbers — were writing up accounts of the hitherto unknown countries and cultures of the world they had visited. Printers were not slow to discern and develop a market for these accounts, and a recognised series of rhetorical strategies

for such writing was already established, which only the most skilled and confident of authors would be able to flout. Indeed, the novelists were not slow to adopt the convention of the voyage as a narrative device — as in *The English rogue* (Head and Kirkman 1665–71), *Robinson Crusoe* (Defoe 1719), or *Gulliver's travels* (Swift 1726) — precisely because it was so formulaic and its discourse predictable. But if the Society, which took the examination of all that could be known as its purview, were to be able to make any use of this material in its deliberations, it had to attempt to exert some control over the form and style in which this type of document could be couched: to eradicate the fanciful and the personal, the Baconian Idols of the Tribe, the Theatre, the Marketplace, and the Cave. And so, as Thomas Sprat, in *The history of the Royal Society* (Sprat 1702) indicated, 'they have therefore been most rigorous in putting in execution, the only remedy that can be found for this extravagance [of language]: and that has been, a constant resolution, to reject all the amplifications, digressions, and swellings of style: to return back to the primitive purity, and shortness, when men delivered so many things, almost in an equal number of words. They have exacted from all their members, a close, naked, natural way of speaking; positive expressions; clear senses; a native easiness: bringing all things as near the mathematical plainness, as they can: and preferring the language of Artizans, Countrymen, and Merchants, before that, of Wits, or Scholars.'

Serious theoretical engagement with the problem of representing through words the experience that lies beyond the knowledge, the sensibility, of the audience, is thus not new. To write, to describe, is inevitably to hide a reality behind the other reality of words; and sometimes the author may be unaware of how his own assumptions and linguistic strategies are concealing from *him* the things that are there to be seen. A fine example of this is the very first expedition report, so to speak, in the history of European engagement with the unknown cultures outside its mindset: Columbus' letter to Luis Santangel, written as he returned to Lisbon in *Niña*, tells us things he could not possibly have known, asserts things he could not have been told, and selects its material according to the commercial and political assumptions of both its writer and its reader: printed within a week of his return, it is an investors' prospectus for a second voyage. Words carry with them the myths that control how we see, conceptualise, experience. The exploration of the encoding of unsuspected values and assumptions into the very texture of writing, the attention to the silences and reticences of the text, the awareness of the unsaid pressures of its context on that text, has been the main concern of twentieth-century critical theory after Saussure. We read very guardedly, and with a quite proper awareness of our own compromised position as scholars and critics.

This is a long book about a book, and the *mentalités* with which it, and discussion of it, engages. It is the more difficult to review for that. It is not an edition of

James' remarkable narrative, of which this reviewer felt he needed to have a copy hard by as he read Professor Davies' discussion. It deploys confidently, if sometimes uncritically, the analytical strategies of modern literary critical theory, and that does not always make for the easiest reading, for it demands a lot of its reader. But taking its cue from the work of Noam Chomsky (1988), Mary B. Campbell (1988), and Steven Greenblatt (1991; Greenblatt and Gunn 1992), among others, it addresses, through its discussion of James' narrative, the important issue of the representation of the environmental or cultural Other, and how that representation may be received by a reader: and no reader is a neutral. It could not have been written 30 years ago: the tools were simply not then there. Whether or not those sharp new tools will themselves be subject to deconstructive criticism remains to be seen.

In 1631 Thomas James, who may have been born in 1593 and died probably in 1635, sailed in *Henrietta Maria*, with a commission to search Hudson's Bay (as it then was called) for a way to the elusive North West Passage. His ship, named after Charles I's queen, was provided by the Bristol Society of Merchant Venturers: Bristol merchants, prominent in the New World trade, stood to gain a lot if a viable direct route to trade with the wealth of China, India, and Japan could be found. (No voyages before Cook's in 1768 — and not even that, wholly, even though the Royal Society sponsored it — were for scientific motives: the imperatives that drove the investment in these hazardous undertakings were economic and political.) The fact that James, a lawyer before he turned to the sea, was entrusted with a valuable ship and a well-found expedition suggests he was held in high respect. Indeed, as a member of the Inner Temple he seems to have had a number of well-connected friends, interested in the art of navigation and the mathematical sciences.

He sailed round Greenland and into Hudson Bay, where he met Luke Foxe of Hull, who in the pinnace *Charles* had that same year sailed from London on the same fruitless search, and was then on his way home to a retirement of neglect. Foxe was the first to circumnavigate Hudson Bay, the first to investigate the eastern waters of Foxe Channel and the first to return home without the loss of a single man. Foxe was what Pepys would have called a tarpaulin: a practical seaman, trained by experience, with a considerable distrust of the mathematical theory that James brought to his new profession. James sailed to the head of the bay that bears his name and spent October 1631 to July 1632 icebound on Charlton Island. He got back to Bristol in October 1633. His narrative, *The strange and dangerous voyage of Captaine Thomas James, in his intended discovery of the Northwest Passage into the South Sea* (James 1633), appeared a very short time after his return. Though it would be neglected somewhat for much of the nineteenth and twentieth centuries and James dismissed as an insignificant failure as an explorer, it had some vogue: reprinted some decades later, it was reprinted or summarized several times through the

eighteenth century. Modern editions start with that for the Hakluyt Society edited by Miller Christy (1894), *The voyages of Captain Luke Foxe of Hull and Captain Thomas James of Bristol in search of the North West Passage*. Since the 1970s the book has been reprinted, paraphrased, excerpted, and even (in 2002, in Canada) been presented as a dramatic reading. The University of Göttingen copy of the first edition is available in electronic format on the Web.

James' book has all the marks of a very serious production, designed for use as instruction as well as record. It was 'Published by HIS MAJESTIES command' no less; its title page promises a record of the 'Rarities observed, both *Philosophicall* and *Mathematicall*', and includes a 'Plat or Card for the Sayling in those Seas, Divers little Tables of the Author's, of the Variation of the Compasse, &c' and Henry Gellibrand, 'Astronomy reader at Gresham Colledge in London' — the intellectual birthplace of what would become under Charles II the Royal Society — wrote an 'Appendix concerning *Longitude*' and there is 'An Aduise concerning the philosophy of these late Discoueries, By W.W.' Gellibrand, as Davies does not mention, was a very distinguished supporter indeed: for a time a Fellow of All Souls, he did pioneering work on the secular declination of the compass, and followed Henry Briggs in the development of trigonometrical and logarithmic tables, and by the time of James' book was Professor of Astronomy. His appendix was an attempt to solve the problem that bedevilled mariners until the development of Harrison's chronometer. James' book was one of the earliest accounts of a voyage of exploration that attempted to use the developing practices of the precise measurement of phenomena, and as a publication it moved the goalposts: formally and conceptually it broke new ground, and demanded new things of its readers.

James could write: not all 'explorers' or 'discoverers' — one is cautious of those words now — could or can. This is not a quiet and sober narrative. It is exciting. His prose is vigorous, gripping, vivid — he was a fine stylist, and through all the vicissitudes of his reputation as navigator and 'scientist' has been so recognized. For his book gives an account not only of a place and a journey, but also (and the distinction is important) of an experience. There are many vivid descriptive passages of difficulties faced and the emotional response of the writer and his companions. He has a talent for the well-told anecdote — such as the macabre incident of the gunner, buried at sea some distance from the ship, whose body, clearly visible through the clear ice, drifted back to the very side of the ship. James is confident enough as a writer, and aware enough of the literary strategies involved, to include passages in verse as well. One of these, a restrained, workmanlike piece on the companions he lost in the dreadful winter of 1631/32, Alastair Fowler thought it interesting enough to anthologise in *The new Oxford book of seventeenth century verse* (Fowler 1991: 335). Some, following J.L. Lowes' *The road to Xanadu*, see in James' account of the Arctic one of the elements that went into the imaginative alchemy of Coleridge's

Ancient mariner. There are those (like Professor Davies) who claim the book with some justice as an 'important early contribution to Canadian writing about surviving in that perilous northern environment.'

This is an ambitious book, developing themes in Professor Davies' recent work. It addresses important, even if fashionable, issues that concern all whose interest or specialism takes them into engaging with accounts of travel modern or ancient. It adopts the post-Greenblatt and Campbell change of focus from the *result* of travel, however subtly examined, to the way the accounts of it are written and constructed. Modern scholars reject the implicit assumption of 'realism' — that explorers or writers simply wrote down what they saw, like in some sort of mirror — and stress the way writing constructs its own reality. The text tells us almost as much about the maker of the text, and the context in which he or she operates, as about what it addresses. 'Geography' as a new discipline, beginning with the creation of what we would recognise as modern maps, drew on exploration — on inherently 'realist' assumptions. We are now much more alert to the cultural influences and forces lying behind maps and their development, and by the same token written descriptions of the journeys and the world, and their constraints on their audiences.

Professor Davies' first chapter sets out the case he later develops for reassessing the exploratory work of James, entering a convincing plea for recognition of his importance. He shows him to have been a much better observer and 'scientist,' and a more serious contributor to geographical knowledge, than the dismissive attitude prevalent since John Barrow would suggest. (In 1818 Barrow accused him of incompetence in the face of climatic and environmental difficulties with which he ought to have been able to cope.) But this in turn entails understanding the way James chose to present his account — the strategic options he had, and what his choice of them reveals. This approach to the book, as exercise in construction/writing, is complementary to an examination of how it was/would be interpreted by James' readers, who would recognise, consciously or not, genres and *topoi* as determinants on their response. This part of Professor Davies' study leads naturally to a general theoretical discussion of the way exploration is written and received, in the first major section of the book, 'Interpreting exploration narratives.' There is an authoritative survey of the current and recent work in its complex cross-disciplinary field and a summary of the historical context and development of its methodology. Up to the minute in its references, this discussion is by its very nature not of the most accessible, but the wide range of material is handled clearly and some helpful diagrams — those on page 93, 'Influences on the construction of an exploration text,' or on page 146, 'Themes in exploration literature,' are examples — summarise the argument and the conceptual framework and could be generally useful. The second part of the book returns to 'Evaluating the work of Captain Thomas James.' Professor Davies is aware of the intricate prosopography of the time, the series

of intimate networks of family and patronage that held together and conditioned early modern society — much smaller than we sometimes remember, where everybody who was anybody knew everybody else who was anybody. The book and its context are subjected to a detailed and thorough analysis, before reaching the conclusion of the final sentence: ‘it was . . . James’ *narrative, not his voyage and wintering*, that should be seen as his true memorial — one that led to so many passages of enquiry and representation.’ One has to agree. Though sometimes the writing could be less diffuse, and an old-fashioned editor might have picked up the occasional nonsense where a fossil of an earlier draft is embedded in the text (for example, on page xii), this demanding book will suggest and enable the exploration of other texts. (The design is also a little mannered, to my taste, and the format (26 × 20 cm) is going to make shelving it difficult.)

There is every reason why the hermeneutic principles from literary theory post-1980 should be applied to the narratives of explorers as well as to other types of writing: any permanent value they claim must be justified by palpable utility across the board. The problem with the theoretical approaches that are now providing the very grammar of literary and historical study is that they are tools that can only do what those tools were designed to do: and those tools, if valid, are equally sharp upon their user. A sense of proportion and judgment in their combination and deployment is crucial in the critic or scholar. What the theoretical so signally fails to address — perhaps because it is as intractable a problem as ever it was for Aristotle — is the real delight we take in what we know to be fictional, the pleasure we get from that which, if it we were really experiencing it, would horrify or disgust. And from the writer’s point of view, the theorist can only take us a part of the way: the itch to write — and James could certainly write with a power that was not lost on Coleridge or his friend Southey — is imperious, and writing itself a half-conscious exploration of experience that is for ever transmuted by the act of writing: ‘I write to know what it was I saw,’ says a character in one of Antonia Byatt’s novels: yes, but afterwards you can no longer see what you saw: the words are in the way — are the way. (C.W.R.D. Moseley, Hughes Hall, Cambridge CB1 2EW.)

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SIR JAMES WORDIE, POLAR CRUSADER: EXPLORING THE ARCTIC AND ANTARCTIC.
Michael Smith. 2004. Edinburgh: Birlinn Ltd. xix + 371 p, illustrated, hard cover. ISBN 1-84158-292-1. £25.
doi:10.1017/S0032247405274417

Michael Smith has produced a well-documented and highly readable account of Sir James Wordie’s life. My own first impression on meeting Wordie in 1949 was that here was a dour Scot who had succeeded in grasping the reins of almost everything in Britain’s polar establishment. To cross him would spell death to hopes of a career in polar research. I trod carefully.

Wordie was born in Glasgow in 1889, graduated in geology from Glasgow University in 1910, and moved to Cambridge. Here he joined Sir Ernest Shackleton’s Imperial Trans-Antarctic Expedition 1914–17 as geologist. While the fortunes of that expedition have been exhaustively covered in other books, here for the first time we have Wordie’s diary — albeit an abridged version in an appendix. The extracts extend from December 1914, when *Endurance* left South Georgia, to September 1916, when the survivors reached Punta Arenas after their rescue from Elephant Island. Wordie was one of the few men who kept up his diary after the sinking of *Endurance* — not every day but whenever he had something to say. By judicious selection, Michael Smith weaves Wordie’s notes into the narrative of the ice drift, the boat journey to Elephant Island, and the mental and physical ordeal of waiting for a rescue that might never have come. While there are few new revelations, Wordie was evidently one of the most unperturbable characters on the expedition.

On reaching Chile, Shackleton (belatedly) appointed Wordie chief of the scientific staff, with the responsibility for ensuring that all of the relatively modest findings of the expedition would be prepared for publication. On returning home, Wordie joined the Army and was sent to France. He was fortunate to survive the Battle of Lys in April 1918, which cost the lives of around 50,000

men. Wounded in the early stages, he was invalided home.

Shackleton showed his lasting respect for Wordie by inviting him to join an expedition to the Beaufort Sea, and when that did not materialize, to accompany him on a circumnavigation of Antarctica. However, although Wordie had a great respect for Shackleton's qualities as a leader, he was concerned about his indifference to science, so did not accept.

Michael Smith has done an excellent job of describing Wordie's participation in seven Arctic expeditions between 1919 and 1937, which, as Cambridge long-vacation expeditions, could be undertaken without interrupting his university career. Two summers were spent in Spitsbergen, one on Jan Mayen, and four in Greenland, two of which also worked in Baffin Island. The lasting legacy of these expeditions and others organized from Oxford was that they served as a training ground for many who would afterwards make a name for themselves in fieldwork: Pat Baird, Colin Bertram, Edward Bingham, Andrew Croft, Launcelot Fleming, Vivian Fuchs, Alexander Glen, Richard Hamilton, Martin Lindsay, James Marr, Noel Odell, Quintin Riley, John Rymill, Brian Roberts, Kenneth Sandford, Edward Shackleton, Alfred Stephenson, Lawrence Wager, Gino Watkins, and John Wright.

Wordie had applied to join the 1922 expedition to Mount Everest but was rejected on medical grounds. However, anecdotes from his Greenland days showed his love of mountaineering in spite of its hazards. One day, on becoming wedged in a crevasse, his jacket burst into flames when a box of matches he was carrying ignited. Luckily his colleagues were on hand to rescue him and douse the fire.

Michael Smith's chapter heading 'A gift for intrigue' encapsulates Wordie's steady progress to becoming virtually indispensable in British polar affairs. In 1920 he was one of three men who drafted a prospectus for the establishment of the Scott Polar Research Institute. When it was established he became a dominant partner in its Committee of Management and remained so for decades. From 1939, under Wordie's direction, SPRI was involved in secret work for the Directorate of Naval Intelligence. In 1943 Wordie left to become one of a triumvirate managing the wartime naval Operation Tabarin in Graham Land. He played a critical part in its direction from 1943 to 1945 and in its post-war evolution as the Falkland Islands Dependencies Survey (which in 1962 was renamed the British Antarctic Survey).

In 1948 Wordie was elected to the Council of the Senate in Cambridge. In 1949 he became Chairman of the UK Committee for the Norwegian–British–Swedish Antarctic Expedition of 1949–52. In 1951 he was elected President of the Royal Geographical Society and also deputy chairman of the Himalayan Committee that led to the successful Mount Everest expedition of 1953. In 1952 he became Master of St John's College, Cambridge.

In 1955 he was elected vice-chairman of the Committee for the Commonwealth Trans-Antarctic Expedition of 1955–58 and also Chairman of the British National Committee for the International Geophysical Year of 1957–58. In 1957 he received a knighthood.

Truly a remarkable life and a story well told. Although the author lists the names of many who helped him in his research for the book, one howler makes clear that his manuscript was not offered to them for critical review. On page 244 we read that in 1958 Guy de Robin [Gordon Robin] was appointed Director of the Scott Polar Research Institute. (Charles Swinbank, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

SEABIRDS: A NATURAL HISTORY. Anthony J. Gaston. 2004. London: Christopher Helm, A&C Black. 222 p, illustrated, hard cover. ISBN 0-7136-6557.2. £35.00.

doi:10.1017/S0032247405284413

Seabirds hold a great deal of fascination for many birdwatchers. Maybe this is because they often breed in large colonies in dramatic settings, or perhaps it is because a lot of them seem to disappear from land for many months in the winter, only to reappear the following summer. Either way, they are an enigmatic group, and one deserving of attention.

Some birdwatchers study seabirds only occasionally, when on the coast as part of a general birdwatching hobby. A few, more dedicated, amateur birdwatchers are particularly attracted to them, and spend many hours either on the coast or out at sea on 'pelagic' trips watching them. These people even look forward to the foul weather, which may bring their target in sight of land.

Fewer still in number are the professional ornithologists who devote the greater part of their lifetime to studying seabirds, trying to piece together the factors that influence such things as their populations, behaviour, and movements. These are the truly dedicated seabird researchers. Anthony J. Gaston is without doubt in the latter category, having studied seabirds in various parts of the world, notably Arctic Canada, British Columbia, and New Zealand. Indeed, he has worked for the Canadian Wildlife Service on the ecology of seabirds for 30 years, and is thus well qualified to write about the subject.

This book is one of the latest offerings from the Christopher Helm/T&AD Poyser stable, which has a well-deserved reputation for producing authoritative, general, natural history books. There are numerous books on the market covering the seabirds, so what does this one have to offer?

In his introduction, the author states that he has written this book to be read as a general book on seabirds. He claims not to have written it as a scientific text, but rather as a natural history book. The target audience, therefore,

must be people interested in general natural history. In order to meet this aim, the book should be both readable and entertaining to the general birdwatcher who may wish to purchase it.

The opening chapter begins with deciding which birds are seabirds. Whilst this may seem fairly straightforward, there are some birds that do not quite 'fit.' For example, the phalaropes are included but the grebes (some of which spend a substantial part of the year at sea) are excluded. The author gives detailed reasons for this apparent conflict. He then introduces the concept of what he calls the 'seabird syndrome.' This is the assemblage of the various aspects of behaviour and ecology of seabirds, which singles them out as being different to terrestrial birds. It underpins much of the rest of the book, and the theme is carried throughout.

Gaston goes on to discuss those features of behaviour that are common to seabirds and marine mammals, such as the pinnipeds. For example, both groups have members that are colonial breeders and both groups forage for food in the ocean.

Much of the rest of the book details other aspects of seabird ecology. This includes the effect of weather, the El Niño Southern Oscillation, feeding behaviour and foraging at sea, coloniality, population dynamics, life-history analysis, and migration. It includes reference to the effect of long-line fishing on the tubenose family in the Southern Ocean.

The information presented to the reader is derived from numerous research publications and journals written by the author and his fellow researchers. It represents a consensus of what is currently known about the ecology of seabirds, and there is good use made of tables and graphs throughout to illustrate the text. There are both black-and-white and colour plates, as well as numerous drawings.

Where needed, the author refers to the papers that provide the evidence for the subject with which he is dealing. However, I admire his willingness to speculate when there is no supporting or conclusive evidence. This emphasizes the personal touch to the book. For example, when discussing seabirds hunting underwater, he makes a 'wild guess' that the glide phase (the time when the bird is not making forward thrusts using its feet) is important for the detection of prey.

There are numerous points of interest to the general reader scattered throughout the book. As an example, for the last 30 years or so, many birdwatchers have been intrigued by the plumage characteristics of the Iceland gull (*Larus glaucooides*)/Thayer's gull/Kumlien's gull complex. Gaston presents information that postulates that the differences in the wing-tip patterns between these three forms (shortly to become species?) can be attributed to geographical separation in the Pleistocene glaciation. It is believed that Thayer's gull became isolated at this time by the great Laurentide ice sheet, and had to develop new migration routes. When, in a subsequent interglacial, they

recolonised the Arctic, they met up with Iceland gull, and interbred, leading to the situation that prevails today of three different wing-tip patterns.

The reader is told about the threats that seabirds are under today, and polar bears (*Ursus maritimus*), it seems, represent a significant threat to breeding seabirds. This may be why many of them have taken to nesting on more or less sheer cliffs, which the bears cannot climb up.

The author discusses the distribution of seabirds around the globe, and indicates one reason why there are no surface diving seabirds in the tropics is because of predation by fish.

In the chapter on feeding behaviour, he points out the difficulties of studying how seabirds catch their prey underwater, and explains that much current information is based on inference. Interestingly, it is suggested that king penguins (*Aptenodytes patagonicus*), which dive 300 m, prefer to feed on lanternfish (*Myctophidae*), suggesting that they may use underwater vision to see the bioluminescence of the fish in order to catch them.

In the same chapter, the author discusses research on the diving behaviour of seabirds, especially the thick-billed murre (Brunnich's guillemot) (*Uria lomvia*), using several graphs to usefully illustrate the results. Birds were caught and fitted with time/depth gauges or, more recently, maximum-depth recorders and time-depth recorders. Gaston also makes the point that this is still technically difficult fieldwork to carry out, and that more data would be useful.

It was fascinating to read that the razorbill (*Alca torda*) exhibits lekking behaviour. The reader is briefly told that males congregate at chosen boulders and the females visit in order to mate. I, for one, would like to have read more about this comparatively rare breeding strategy in the bird world. In addition, why should it be that, in murre (guillemots), razorbills, and little auks (*Alle alle*), it is the adult male alone that tends for the young once they have left the nest for the sea, and how was this information gleaned?

One subject covered in more depth is the adaptations breeding seabirds have for preserving prey when caught at sea. Some birds spend many hours or even days away from the nest, and so, logically, some of this food, which the adult birds regurgitate to the nestlings, should have begun to decompose by the time the parent bird returns to the nest. Apparently, the adults feed themselves first when they start out on a foraging trip, and then catch prey for their young just prior to returning to the nest. Tubenoses, including the albatrosses, possibly also use stomach oil as a food preservative. It is this group of birds that spend the longest intervals away from the nestling on foraging trips.

One feature I particularly enjoyed was that each chapter began with an anecdote from a seabird-watching experience. Stories include sea-watching in huge storms or watching the largest concentration of birds the author has ever seen at one time. This set the scene for the rest

of the chapter, and left me feeling that I wish I had been there as well, and made me reminisce about some of my own seabird-watching experiences.

Much has been discovered about the biology and ecology of seabirds during the last 50 years or so, but this book also rightly points out that there is still a great deal more to learn. It indicates where current knowledge is, and gives pointers to where further study is needed. It should surely act as a stimulus to future workers to fill the knowledge gaps. No doubt, with the development of better equipment it will be possible to study individual seabirds in more detail than has hitherto been possible.

If there are criticisms to be made of the book, then these are few. One I would make, however, is that the photographs could have been better. Many are by the author, and are not in sharp focus. Although it is easy to feel a sense of attachment to one's own work, there are many good quality seabird photographs available today, and I would have liked to have seen better use made of these.

So, in summary, does the book measure up? The answer is a resounding yes. The author writes in an easy-going style, and in a way that gets his message across. At times, I found it difficult to put down. I thoroughly enjoyed reading the book, and learnt a great deal in the process. Gaston comes across as someone who is at one with his subject, with an enthusiasm and willingness to share his knowledge and experiences with others. There is much in the book of interest to both the general birdwatcher and more serious ornithologist, and I have no hesitation in placing it with my other Poyser books on the bookshelf. (Kevin Elsby, Chapel House, Bridge Road, Colby, Norfolk NR11 7EA.)

FROZEN GROUND ENGINEERING (Second edition). Orlando B. Andersland and Branko Ladanyi. 2004. Chichester: John Wiley & Sons. xii + 363 p, illustrated, hard cover. ISBN 0-471-61549-8. doi:10.1017/S003224740529441X

A quarter of the land in the Northern Hemisphere is underlain by permafrost — ground that is frozen year-in, year-out. The greater part of the Russian oil and gas reserves are within the permafrost regions and they are very important in the world energy picture. Northern Canada and Alaska are comparable, but the Russian cold regions have been inhabited by native peoples and many others for centuries, with a much more established and recorded history of development, while the North American cold regions did not receive much attention from engineers and planners until the Second World War. It was Arctic military considerations that revealed the geotechnical and construction problems associated with permafrost in North America and led to an English-language literature on the subject. In the ensuing 50 years, only some half-dozen books appeared in English on

these topics, and not all dealt in detail with engineering methods. Andersland and Ladanyi's book, originally published in 1994 and now updated, concentrates on the engineering properties of freezing ground. A well-illustrated book by Davis (2001) is noteworthy for giving a broader, easily read account of the peculiarities of permafrost, and why it has so much importance for the engineered infrastructure. But if we, or our students, want to see what the engineer actually does about it, Andersland and Ladanyi is the book to consult.

Engineering in the North American permafrost began very much as a modification of geotechnical practices used in warmer climates, often an *ad hoc* approach to difficulties caused by the thawing of ice-laden ground or by the heaving of freezing ground and the damage thus caused to structures (substantial parts of the book apply to ground subjected to winter freezing alone — affecting an equally great area as that underlain by permafrost). In Russia there was a longer tradition of responding to the conditions in developing roads, railroads, and utilities, and even foundations for multi-storey masonry buildings, albeit with mixed results.

The polar regions from a Western perspective have long been associated with snow and ice, and only gradually has emphasis shifted to include the extensive, resource-rich, and often equally cold land masses, without perennial snow or ice, that extend from near the North Pole, to far south of the Arctic Circle. In Antarctica, too, much study is now undertaken of soil and ground conditions, although this is mainly driven by scientific research and not by industrial activity.

Snow and ice have had a central role in polar research, and the scientific study of glaciology as a consequence has played a major part. Clearly, snow and ice are special materials, the particular behaviours of which require unique considerations. Frozen ground, however, has not received a comparable treatment: it has taken a half-century for the Western geotechnical engineering literature to fully recognise that freezing/thawing in porous media (soils and rocks) has unique consequences for those properties and behaviour with which the engineer (and thus the rest of us) must be concerned. Deformations and ruptures of frozen ground, and its mechanics, perhaps most closely resemble that of ice itself. Certainly deformation by creep, clearly evidenced on natural slopes, is a special problem for major constructions and particularly pipelines. The loss of strength on thawing, with the liberation of water that was drawn into the ground when it originally froze, can only be properly understood from the microscopic structure of soils and the thermodynamic conditions for the freezing process. Certainly, frozen soils are very different from 'ordinary' soils and the development of an analytical approach based on the thermodynamic behaviour of the soils is still underway.

Andersland and Ladanyi are writing for engineering specialists — but largely because the subject is of recent (and perhaps one should say retarded) development, one

can get a good impression of the problems. When one considers the extent and scope of developments in the cold regions of the world, the pipeline projects costing tens of billions, the associated development of infrastructure, buildings, roads, and airports, the economic imperatives, and all the costs and uncertainties involved, it is remarkable that only one comprehensive text book should have appeared in the last seven years (unless one includes the English translation (1998, 2004) of Yershov's informative Russian text, which to a remarkable degree combines the fundamental science with engineering practice and much else). Clearly, however, the circumstances associated with the Cold War through Soviet time were not conducive to free exchange of information between East and West. Since then, the ups and downs of economic cycles and of the oil and gas industry have limited the scientific attention and the research and training in cold regions engineering, which has rather suddenly become so important. Not many people know that more than a hundred thousand kilometres of gas pipeline have been built through Siberian permafrost. If ever there was an example of where the experience of others might be useful, the planned construction of the first full-size gas pipeline through permafrost in North America would seem to be it. Even Andersland and Ladanyi, with their lifetimes of experience, seem to underestimate the implications, which are by no means limited to northerners alone. Much of what they write is fundamental to all large-scale engineering in frozen ground, but 'pipeline' did not make it into their index.

The second edition of this book will be welcomed by those directly concerned with engineering expertise for cold regions. For them, there is no really comparable guide available within a single cover. There is also an extensive list of references. Large-scale engineering and investment should be a matter of concern for all those working with the social and environmental questions of the polar regions. For the non-specialist, the book shows what northern geotechnical engineering actually involves. The challenges that frozen ground presents need to be appreciated (if not necessarily fully understood) by many others than engineers; the implications are wide-ranging for northern residents, as well as for those living in warmer lands. The engineering required must be understood by those responsible for the enormous expenditures envisaged for industrial activities, notably oil and gas extraction, in the Arctic and cold regions. (Peter J. Williams, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

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WITH A CAMERA IN MY HANDS: WILLIAM O. FIELD, PIONEERING GLACIOLOGIST. As told to C. Suzanne Brown. 2004. Fairbanks: University of Alaska Press. xxiv + 184 p, illustrated, soft cover. ISBN 1-889963-47-X.

doi:10.1017/S0032247405304414

William O. Field was a glaciologist of considerable standing. In particular, he was central to the development of the subject in North America. In the late 1920s, Field made observations of Alaskan glaciers for the first time in 30 years, and revealed that they had each retreated by considerable amounts. Thus began both his career as a recorder of glaciological changes and the international recognition of the importance of glacier monitoring. This book, edited from an oral history given by Field to C. Suzanne Brown, comprises the memoirs of one of the founders of glaciology as a scientific discipline. Importantly for glaciology, Field was fascinated by the use of photography in the acquisition of documentary evidence. It seems he always had a camera at hand in the field, which led to the compilation of an unrivalled inventory of glaciological pictures now held in archive, together with his collection of maps, books, and field notes, at the Rasmuson Library of the University of Alaska Fairbanks. This book utilises the visual legacy of Field to illustrate his remarkable life story as a natural scientist, an educator and administrator, and, importantly, as a supporter of field-based glaciological research.

The book begins with an account of Field's early life. It describes how a young boy from a comfortable middle-class family became self-aware not only as a scientist but as a caring citizen during a period of considerable social change. While his early years were pleasant, playing golf and tennis, to Field they were 'unproductive.' On reflecting on his lifestyle, and those of less fortunate people, Field made a self-conscious effort to use his time more purposefully. Field's father was clearly a major influence, and when his son was 16 years old, took him to the Canadian Rockies, where Field began to observe the natural environment through his camera. On this and subsequent trips to the Rockies, Field took photographs of glaciers from known, recordable positions. So began his earliest celluloid time-series of glacier fluctuations. Three years later, when his father took him to the European Alps, Field climbed the Matterhorn and set foot, for the first time, on a glacier. These early excursions were the foundation of his glaciological career. Field explains and illustrates how each subsequent visit became more adventurous and required greater logistical planning. As a consequence of these trips, Field became qualified to join the American Alpine Club, an association that lasted his entire life and that allowed him to pursue his love of mountain environments.

In 1925, Field visited Alaska. The book describes the journey and illustrates the early town scenes and infant infrastructure that awaited him. It also explains how many

previous scientists had predicted that glaciers had changed their size in the past, but that few had quantified recent change, and that no one had thought seriously about how to document contemporary change. On returning to Alaska a year later, Field (still a student) began the process of identifying how the glaciers in Glacier Bay had changed since the last study (some 30 years earlier). Field and his co-workers visited many glaciers and recorded (using photography) for the first time how they had receded. On this trip, Field demonstrated the scientific power of photographic recording, and so a life-work began.

As there were no jobs in glaciology, however, Field put his photographic and travelling skills to use in the film industry. This work allowed him to hone his photographic skills, documenting life in remote localities in the Caucasus and British Guiana. Because he could not receive a license to make films within the US, Field, wishing to spend more time with his young family, terminated his career as a film-maker.

In 1931 Field revisited Alaska, where he documented the retreat of ice in Prince William Sound, and on his return he gave a talk about his findings to the American Geographical Society. Later he was invited to turn his lecture into a scientific paper. Having now published, Field began to be noticed by academic communities. His organisational skills for field expeditions were also quickly noticed, and he became employed by the American Geographical Society and subsequently involved in several committees. In particular, he became chair of the US Geological Survey's Committee on Glaciers in 1948. This allowed him to organise a serious effort to quantify the glaciers of Alaska. In the next few years a team of scientists was assembled and deployed in the field to make systematic recordings of Alaskan ice masses. At this point in the book one notices significant changes in clothing, appearance, and scientific instrumentation. This is as much a reflection of the changes in camera

technology (such as no posed portraits) as it is recognition of the beginning of modern glaciological science in the 1950s and the remoteness of Alaska 25 years earlier.

In 1957–58, Field took part in the International Geophysical Year. He recalled how one of the most important results of the IGY was the true internationality of the programme, a feature that Field felt would characterise research in the twenty-first century. Certainly by the late 1950s the importance of Field's work was recognised internationally, and several of the world's glaciated regions were surveyed using methods he initiated in Alaska. During the IGY, Field attempted to resurvey all the Alaskan glaciers that he had visited previously. In so doing, he established a benchmark in the time-series of glacier changes, which was archived in the newly established World Data Centre for Glaciology. That data centre remains one of the most significant data repositories for glaciological data in the world, and is testament to Field's visions of both data acquisition and glaciological field studies.

In the 1960s Field continued his involvement in glaciological fieldwork and editing; he compiled information on 'Mountain glaciers of the Northern Hemisphere,' which was eventually published in three volumes in 1975.

Brown must be congratulated on this wonderful compilation of a fascinating life story and its accompanying photographic evidence. As Field was a modest man, it seems highly appropriate to document the comparative photography of Alaskan glaciers at the end of his story. It is by viewing these that one is able to see the importance of his contribution to glaciology. Without this evidence, glaciology may have lacked a witness for early twentieth-century glacier changes that are nowadays critical data points in our knowledge of glacier responses to modern climate change. (Martin J. Siegert, Bristol Glaciology Centre, School of Geographical Sciences, University of Bristol, Bristol BS8 1SS.)