

here is on the onshore record, and the Cenozoic successions, drilled offshore, are left to the final chapter.

Chapter 3 provides a fascinating account of the geomorphology of the continental shelf, and the processes responsible for the pronounced bathymetry of the sea floor. Of particular interest is the recognition, using remote-sensing methods, of a variety of relief forms that have counterparts on land in northern latitudes, such as moraines, drumlins, and flutes, as well as features resulting from subsequent iceberg scour. A number of regional descriptions testify to the varied bathymetry of the continental shelf.

Sedimentology is the topic of chapter 4, combining assessments of the following environments: subglacial, the grounding zone, proglacial bays and fjords, continental slope and rise, and abyssal plain. These general reviews are followed by a number of case studies. The interpretations rely heavily on seismic data, but the recent developments in understanding glacio-marine sedimentation, based on process studies, in other parts of the world, or indeed Antarctica, are not given the attention that is warranted. Furthermore, a weakness in this discussion is the absence of a recognizable approach to dealing with glacial sedimentary facies. Thus genetic and non-genetic terms are interspersed, resulting in confusion concerning both the nature of representative facies and how they are interpreted.

Chapter 5 shows how the results of marine geological and geophysical surveys can be used to determine evolution of the continental margin. In a number of case studies, drill-hole and short-core data, together with geophysical data, are reviewed and sequence stratigraphy defined. Key areas include the Ross Sea, the Pacific–Antarctic margin, the Bransfield Basin, the Weddell Sea margins, Wilkes Land, and Prydz Bay, all of which are considered in detail. This chapter emphasizes how the continental margin has evolved under the long-term influence of glaciation on the continent.

The final chapter is a review of Antarctica's glacial history. The author reminds the reader of the key, but frequently ignored, fact that glaciation has affected Antarctica for a time span that is larger, by an order of magnitude, than in the northern hemisphere, possibly extending back into the Eocene. The author reviews the means of obtaining 'proxy' records from the deep sea, which, although detailed, suffer from the difficulty of reading the ice-sheet signal. The opposite is the case for the continental shelf record, although even here there needs to be careful evaluation of sediments and seismic data. This leads the author into outlining the history of the Antarctic cryosphere, presented in chronological fashion, beginning with the debatable evidence for Cretaceous, Palaeocene, and Eocene glaciations, and including an interesting discussion concerning the dispute about the stability of the East Antarctic ice sheet during Pliocene time. The chapter continues with a summary of case studies relating to Late Quaternary ice-sheet activity, with reviews of whether the West Antarctic ice sheet collapsed

and the extent of the ice sheet during the Late Glacial Maximum.

The book concludes with a comprehensive reference list of well over 1000 entries and a brief index. Overall the volume is well presented, although there are a few typographical mistakes and the odd incorrect reference. There are numerous line drawings, which although not always aesthetically appealing, are at least clear. The photographs are the most disappointing aspect, with poor contrast and sharpness — a pity, in view of the spectacular sites depicted.

In summary, this book represents a significant achievement in drawing together a wide range of disparate information. Although it is not without flaws — notably the treatment of sedimentology — the book is a valuable addition to the literature. It will prove to be essential reading for all Antarctic marine and glacial geologists, whilst students taking advanced courses in glacial sedimentology will find much of relevance. (M.J. Hambrey, Centre for Glaciology, Institute of Geography and Earth Sciences, University of Wales, Aberystwyth SY23 3DB.)

PROTECTING THE ARCTIC: INDIGENOUS PEOPLES AND CULTURAL SURVIVAL. Mark Nuttall. 1999. Amsterdam: Harwood Academic Publishers. viii + 195 p, soft cover. ISBN 90-5702-355-5. £13.95; US\$22.00.

In a year or two the Eskimo would go to the traders if the traders did not come to the Eskimo. And if neither Eskimo nor trader had the enterprise to seek the other, the Indians are eager to act as middlemen between. Commerce in goods may, therefore, be said to have begun, commerce in ideas cannot help following close behind...From the point of view of the ethnologist and sociologist the results of these new forces is clear, the rapid change of ideas, institutions and material surroundings.

These are the thoughts of the famous anthropologist and explorer Vilhjalmur Stefansson, jotted down in his diary on 10 April 1912 (see Pálsson 2001). In these words Stefansson predicts the changes implicated by what are now called globalisation processes. *Protecting the Arctic* is also written by an anthropologist who obviously worries and cares about the course that events have taken in the Arctic. It is, however, not a very emotional product or advocacy manifesto but rather a comprehensive account of the major issues involving cultural viability, changing human–environmental relations and perceptions, and the close and multi-faceted relations between the local and the global. The argument is designed to make the reader better understand these relations and the problems they involve.

In chapter one, Nuttall sets the stage for the book and introduces its main themes. He also states that his purpose is to stimulate debate and pave the road for further research and analysis. He starts off with an outline of Arctic indigenous peoples and the problem of cultural survival, which for him, at least, is as important as the more widespread environmental discourse on biological

diversity, and, in fact, according to Nuttall, these go hand in hand. He maintains that it is no longer, if it ever has been, fruitful to look at Arctic indigenous groups as isolated and untouched by the outside world, as 'they are increasingly tied to global networks of production and exchange and subject to the consequences of globalisation and modernity' (page 2). Nuttall is careful to point out that the Arctic is home to many more inhabitants than minority groups within nation states, and that, of the total population of approximately 10 million souls living north of 60°, only one sixth can be defined as indigenous. It is only in Greenland that indigenous people are a majority of the population. But, as in many other places in the Arctic, there is also a colourful assembly from the world, including 'Danes...itinerant Moroccans, Norwegian and Faroese doctors, Italian mechanics, Dutch geologists, Irish helicopter pilots, Thai hotel maids...' This gives the feeling that it is not a static picture of uniform and unchanging cultures but a rapidly changing cultural landscape. Most of the examples and ethnographic data used by Nuttall come from Greenland, where he draws from extensive fieldwork experience, and, also, from Alaska.

The Arctic environment is at risk, and this is something about which Arctic residents are increasingly aware. In the first chapter Nuttall takes the reader on a tour that many would rather refrain from taking, discussing the nature of various pollutants such as PCBs and how they affect humans and wildlife; the nature of Arctic haze; the footprints of oil and gas extractive industries in the Arctic; unsustainable logging; industrial and military waste; corroding aircraft batteries in rivers polluting drinking water; the *Exxon Valdez* disaster and its consequences; discharges from ships in northern waters; marine mammals and seabirds as casualties of oil contamination; increasing threat of ultraviolet radiation due to thinning ozone layer; nuclear and heavy metal contamination in the Russian Arctic; and, last but not least, the threat and impact of global warming, which is now known to be increasing at a rate much higher in the Arctic than the global average. The Arctic is indeed a critical zone for global environmental change. Nuttall explains why it still makes good sense to use the analogy of the Arctic as the canary bird of the Earth, as an early warning system, not involving a gas leak in a mine but the impact of anthropogenic factors concerning the emission of greenhouse gases in the atmosphere.

This part of the book is particularly sobering reading as it outlines the sheer magnitude of environmental catastrophes in the north. With this in mind it becomes strange how some find it appropriate to describe the Arctic as the 'last untouched wilderness,' as if it were an Eden (without Adam and Eve).

But Nuttall does not leave us there with an emerging gloomy image of the unfriendly or hostile polluted Arctic, ridden with human problems, vanishing cultures on ever thinning ice. The account is realistic, but it also points towards opportunities and positive moves, as people react creatively to solve their problems. Nuttall describes the

prospects of self-determination and how indigenous peoples are organising themselves and seeking empowerment through regional and international co-operation, emerging international movements, and organisations and co-operative ventures aimed at self-determination.

Chapter two deals with issues of environmental problems and different conceptions and strategies of sustainable development in the Arctic, and points to directions leading towards workable environmental policies. Here indigenous peoples' organisations have an important role to play, in processes such as the Arctic Environmental Protection Strategy (AEPS), which has given considerable recognition to indigenous knowledge and participation. Nuttall gives a brief history of the evolution of Arctic environmental politics and especially how NGOs have pushed and achieved a prominent position in the circumpolar environmental arena.

Chapter three examines how indigenous ecological or environmental knowledge has been made part of the Arctic Council's AEPS programmes and the potential it has within this framework of international environmental co-operation. Nuttall situates the Arctic in the global economy, an ever-present reality to be taken into all accounts, and further reminds the reader how the societies in the area are linked to global processes beyond their control.

Nuttall is not in the business of bashing the so-called 'myth of indigenous people as ecologically noble,' or 'green primitivism' as it has also been called. Instead, in chapter four he points out that traditional ecological knowledge (TEK), or local knowledge, must now be looked at in context of how it is used and how it forms an integral whole in local systems of human-environmental relations. He discusses how the idea of unique knowledge and ways of relating to the environment in a benign way is used as a rhetorical tool and contributes to culturally constructed identities for Arctic residents. It is also used to argue for greater rights to resources and lands and to strengthen actions leading to indigenous empowerment. Nuttall, however, argues in line with many other anthropologists, that there is a certain danger in the presentation of TEK as another brand of western scientific knowledge. TEK is local, contextualised knowledge embodied in the individuals who use it, and attempts to bend it to conform to western scientific assumptions and models tend to reify and fundamentally change its nature. Another way of saying this is that TEK is embodied and embedded in people as practitioners in the appropriation of nature. It is not something one can put in bottles and sell at the market. Nuttall quotes a number of anthropological studies, which show the relevance, and validity of indigenous claims for TEK and gives a convincing case that in spite of its rhetorical nature in environmental ethnopolitics it is very much part of reality of Arctic resource users.

This brings up Nuttall's account of the popular idea of the Arctic as a wilderness and its consequences. By definition wilderness is a place or area where there are no people, unless they are conceived as part of the wildlife,

which has long been the fate of indigenous peoples. Indeed, many environmentalists, natural scientists, and some social scientists do not have any great problems with such models. They talk about humans and other animals. But there is a danger in this lumping together of people and animals. Nuttall discusses this problem and how it affects rights to resource use and the perception of non-Arctic residents of indigenous inhabitants of the wilderness.

How do the mixed and informal subsistence economies of rural and remote Arctic communities fare in the face of impacts of the global capitalist market processes and protectionist ideologies of western environmentalism? Chapter 5 looks at the case of Greenlandic subsistence whaling and the prospects of sustainable use of living marine resources to provide community viability. Nuttall provides a balanced view of the hottest of potatoes in the global-environmental debate and situates subsistence whaling in the proper economic cultural and ecological context, as a way of life and as a way of survival at the same time. He also shows how international actions hindering the use of marine mammals for the production of livelihoods for Arctic communities in many cases equals cutting the spinal cord of these cultures. Inuit communities find themselves under increasing pressure to defend their subsistence activities and make claims to develop along their own paths, even if it does not confirm to environmentalists' protests that they have thus forfeited their indigeneness, becoming tainted with money and markets.

Chapter six deals with the prospects and problems of tourism in the fragile ecosystems and for the vulnerable small-scale societies of the Arctic. Nuttall seems to be of two minds concerning the likelihood of tourism providing communities with viable options involving alternative and mostly non-consumptive economic practices. But he does give us an enlightening discussion on how people are actively seeking opportunities that eco-tourism and community tourism provide. Tourism is often an option that local people have not chosen, but rather something of an unwelcome intrusion and an extension of external market forces for the fulfilment of the insatiable appetites of tourists from affluent nations.

In chapter seven Nuttall returns to questions of the construction of indigenous environmentalism involving images of original ecologists, discussing the epistemological status of claims to a unique understanding of the environment and the capacity to dwell sustainably in it. His conclusion is that, in spite of the rhetoric it involves, there is a unique opportunity to learn from traditional-knowledge systems and that they must be part and parcel of attempts to comprehend and deal with issues of resource management and sustainable development. The afterword sums up the book's message and core arguments, and reminds the reader of the importance of cultural diversity and that it can, and indeed should, go hand in hand with biological diversity. This is for the sake of those who depend upon the use of natural resources, as well as for a

humanity that needs the knowledge embodied in the cultures that biodiversity sustains.

To conclude: this well-written and thoughtful book is of high value for anyone interested in better understanding the complex issues facing the contemporary Arctic and the relations between its residents and resources. It is to be recommended to those wishing to gain insight into the area and the problems and prospects facing the north. I would especially recommend it to natural scientists who wish to broaden their knowledge of sociocultural processes and how they relate to issues of environmental protection, cultural survival and sustainable development in the Arctic. (Niels Einarsson, Stefansson Arctic Institute, Nordurlod, 600 Akureyri, Iceland.)

Reference

Pálsson, G. (editor). 2001. *Writing on ice: the ethnographic notebooks of Vilhjalmur Stefansson*. Hanover and London: University Press of New England.

HABITAT CHARACTERISTICS OF SOME PASSERINE BIRDS IN WESTERN NORTH AMERICAN TAIGA. Brina Kessel. 1998. Fairbanks: University of Alaska Press. 117 p, illustrated, soft cover. ISBN 0-912006-98-6. US\$16.95.

This slim volume reports the results of the author's long-term studies of songbird habitats in Alaska, primarily in the upper Susitna River basin. The Alaskan region serves as a model of wooded boreal ecosystems, but has added biogeographical spice due to the mixing of western North American species with eastern Nearctic species that reached the northwestern extremities before western counterparts, and eastern Palaearctic species such as the Arctic warbler. Such issues are not, however, the main subject of this book, which concerns itself primarily with the habitat features associated with the presence and absence of the 15 passerine species most frequently encountered in the study. These include Swainson's and varied thrushes, yellow-rumped and blackpoll warblers, and fox and white-crowned sparrows.

After an initial introduction to the study and its methods, the major part of the book comprises essentially two sections. In the first, the habitats of 12 study plots, each selected to exemplify a particular physiognomy, are described floristically and structurally using a combination of text and tables. This section is not the most gripping of reads, but it is clear and the habitats are illustrated with some helpful reproductions of black-and-white photographs. However, the information contained herein is essential for meaningful interpretation of the next section, which takes the reader through the habitat distributions of the 15 study species. The abundance of the species in each of the study plots is presented, along with an analysis of the habitat variables that correlate most strongly with the species' presence. Again, the text here is necessarily rather dull, but some interpretation of the results in terms of both the functional needs of the birds concerned and community interactions provides some interesting hypotheses. In a