

solved only through a focusing of international energies and will. Few of us are able to reach out beyond our immediate work and interests without help of this kind.

NHRI deserves our thanks for this series of valuable review volumes.

#### REFERENCES

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**SHIELD COUNTRY: LIFE AND TIMES OF THE OLDEST PIECE OF THE PLANET.** By JAMIE BASTEDO. Calgary: Arctic Institute of North America, 1994. Komatik Series No. 4. x + 271 p., maps, b&w illus., colour illus., glossary, bib., index. Softbound. Cdn\$20.00.

Mr. Bastedo, a well-known northern naturalist and environmental consultant, is a long-term resident of the Shield country who operates out of Yellowknife, Northwest Territories. The style and content of this book are aptly described in the author's own words:

This book is part personal journal, drawing on events that illustrate my relationship with the land. It is also part storybook, portraying the land's past, present and future as I see it. It is also part reference book, complete with systematic descriptions of ecological phenomena, an extensive glossary of terms and a detailed index. And finally, it is part field guide, providing sufficient information on the region's geology, plants and animals for you to recognize the main ecological players on this particular northern stage. (p. 5)

It is obvious from first opening *Shield Country* to the final pages that Jamie has an unquenchable curiosity and passion for the Canadian Shield, which he infuses into his writing style and successfully passes on to the reader. This book is a delightfully insightful account of the Canadian Shield's last four billion years. The author's literary traverse over vast space and time has been exceedingly well researched. He writes in a refreshing style that puts the reader at ease. While tackling subjects as diverse as the development of plutons and the philosophies of bioregionalism, Jamie writes with clarity, spiced with humour and poetry.

The editors have done an excellent job of keeping this book free of irksome typos and errors. They have also included over 100 photos, diagrams, and drawings, which are interspersed throughout the text. The diagrams help the reader understand some of the more complex geological theories, while the archival and recent photographs visually connect the reader to the landscape and its inhabitants.

This is an ideal textbook for any university course dealing with Canada's North. In fact, I highly recommend *Shield Country* to all who are interested in the North, whether they are high school or university students, naturalists, scientists, consultants or the lay public.

In the introduction (p. 5), Jamie states: "In choosing to write a book about the taiga shield, my aim was as much to inspire as to inform." Congratulations, Jamie—you have succeeded!

**SKUA AND PENGUIN: PREDATOR AND PREY.** By EUAN YOUNG. Cambridge: Cambridge University Press, 1994. 452 p. ISBN 0 521 32251 0. Hardbound. No price indicated.

Adelie penguins are the most loved of all Antarctic animals, while south polar skuas have traditionally been cast as villains. Skuas steal penguin eggs and small chicks by stealth and cunning, while older penguin chicks are strong enough that killing them is a drawn-out, messy business. These conspicuous behaviours have attracted a plethora of subjective comment from laypersons and scientists alike, but objective accounts of the relationship between skuas and penguins have been few.

This long-awaited book is the result of five Antarctic summers, 1965 to 1970, spent documenting the relationship between skuas and penguins. To any biologist, Adelie penguin colonies with their attendant skuas raise a host of intriguing questions. Do skuas depend on penguins to breed successfully? Why do some skua territories have few penguins while others have many, and does breeding success vary with access to penguins? Why are skuas such inefficient predators and what do skuas feed on outside the penguin breeding season? These questions and many more are answered in Euan Young's book.

This is probably the most detailed account of the interactions between any predator and its prey. Young and his team recorded the activities of skuas in tremendous detail, but the results presented are equally intricate. This excessive detail makes the book cumbersome to read and difficult to use. Too often I found myself bogged down in detail, having lost track of the issue being discussed. The book contains a wealth of information and ideas for anyone interested in penguins,

skuas or predator-prey interactions in general, but these ideas are difficult to access. If each chapter had more informative introductions and extensive conclusions, the book would be easier to use.

With such a long delay between fieldwork and publication, is the book sufficiently up to date to still be useful? Young has mostly kept up with the literature, but he does not cite work done by Gordon Court and Garry Miller, who recently studied skuas and penguins at Young's study site. Our understanding of the ecology of both species, and predator-prey interactions in general, has changed greatly in the intervening years. Young has done well in answering today's questions with data collected over twenty years ago. One aspect where I felt old data and methodology did not answer contemporary questions concerned the decisions skuas must make when foraging. Skuas can prey upon or scavenge penguins close to their nests, or feed at sea. Today, behavioural ecologists would want to understand the rules by which skuas decide whether to forage ashore or at sea. Young attempts to address this issue, but the results are inconclusive.

Young found great variation in the behaviour of individual skuas. Some territories contained many penguin nests, others few, and certain skuas preyed extensively on penguins, while others fed mostly at sea. I was pleased to see this individual variation addressed in detail. In many studies, collection of means and standard errors that describe the 'average animal' obscures individual variation which can tell us even more about how animals respond to their environment. Certainly with Young's skuas, individual variation was far more informative than any average animal he could have described.

The relationship between skuas and penguins changes through the short Antarctic summer as both species race against time to complete their breeding cycle. The analysis of seasonal changes comprises some of the most interesting sections of this book. For example, the risks and rewards of predation change markedly. Early in incubation, eggs are mostly yolk and albumen, which spills before much can be consumed. Later in incubation, embryos offer a greater reward for the same risk. Young chicks can be carried off whole, but first they must be extracted from beneath a strong and aggressive parent. There is more food on larger chicks, but they are difficult to kill and dangerous to remove from the colony.

So, after Young's study, what have we learned about the interaction between skuas and penguins? First the relationship is not as one-sided as that plethora of subjective observations suggested. Skuas are far less numerous than penguins, but their propensity to congregate at Antarctic bases and penguin colonies gives an inflated impression of their abundance. Skuas nesting in penguin colonies lose eggs and chicks to other skuas more often than do birds nesting at lower densities elsewhere. They also lose eggs to penguins who attack nesting skuas. Young suggests that it is possible that a greater proportion of skua eggs are lost to penguins than penguin eggs are lost to skuas. Skua predation on penguins is conspicuous, rather than common, and Young's enclosure experiments suggested that most skuas had little influence on

the breeding success of penguins. A few skuas whose territories contained small penguin colonies with many edge nests did have a marked impact on penguin breeding success. However, even in these situations, only those skuas that showed both high interest in penguins and skill as predators markedly affected the breeding success of the penguins. The skua emerges not as the villain of common perception, but as an opportunist that obtains most of its food at sea, but exploits penguin eggs and chicks, carrion and rubbish from Antarctic bases whenever these are available.

This is an important reference book for anyone working on penguins or skuas, and it will prove useful to other scientists interested in predator-prey dynamics. Unfortunately this book could end up used mostly by penguin and skua specialists, as neither the synthesis nor the individual chapter introductions and conclusions give a full indication of the ideas presented.

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A CARIBOU JOURNEY. By DEBBIE S. MILLER. Illustrated by JON VAN ZYLE. Boston: Little Brown and Company. 32 p., colour illus. Hardbound. US\$15.95.

The yearly migration of the Porcupine herd of barren-ground caribou from Alaska to the Canadian Yukon and back is one of Nature's great dramatic stories, and deserves to be chronicled in an artistic format. In *A Caribou Journey*, Debbie S. Miller and Jon Van Zyle have produced a record of that migration and the caribou's daily existence—with children as their primary audience.

John Van Zyle, the book's illustrator, has provided a handsome series of paintings to accompany the text. These paintings clearly reflect Van Zyle's familiarity with the caribou and his knowledge of the terrain he is depicting. The book has a very rich look! All of the full-colour paintings are laid out in a panoramic, double-page spread with the text clearly superimposed.

The author, Debbie Miller, is an accomplished writer who has lived in Alaska for twenty years. She has obviously taken care to record the migration and life of the caribou in an accurate manner. This is her first children's book and she is very well informed on the subject she has chosen.

The book, however, is not quite long enough to do justice to all the material it contains. There seems to be enough here for two books instead of one. The result is an overly condensed text that makes it difficult to determine and appreciate fully the complexities of the migratory caribou's life or the full magnitude of the Porcupine caribou's seasonal migrations. This is, perhaps, a valid consideration only for the adult reader and not truly a strong concern for the children who read this book. I cannot judge the exact appropriate age-range for *A Caribou Journey*. Perhaps, a good 'yardstick' is the fact that I did not have to consult Webster's Dictionary even once!