

The author sets out to provide "an analysis of available methods for evaluating the physical condition and diet quality of ungulates in the wild with special attention given to northern conditions and to caribou." The book is a survey of such methods, noting advantages and disadvantages of each, and recommending the most appropriate methods in the conclusion. There is one table that encapsulates much of the text. The book has a clear emphasis on identifying simple, reproducible methods useful to wildlife managers. Physical condition is defined as "the physical state of an animal considered relative to its medium-term chances of survival and the realization of its reproductive potential according to its age and sex, and to the moment in its annual cycle." Measures of diet quality discussed are confined to methods usable on harvested or field-tranquilized animals. Huot comments primarily on measures of growth, glands and organs, fat reserves, and blood chemistry. There are smaller sections on visual examination, hair analysis, rumen content analysis, fecal diaminopimelic acid (DAPA), parasites, behaviour, and demographic vigour.

In the conclusion, Huot recommends these measurements in harvested animals: eviscerated weight, morphometric data and standard fat indices (kidney fat, femur fat, back fat), abundance of parasites, reproductive data, and chemical analysis of rumen and fecal material for diet quality and DAPA. The use of indicator muscles is suggested as a promising new approach. Huot identifies fall and late winter (typically best and poorest condition) as critical periods for sampling, cautions against the use of small sample numbers (50 is a suggested target), and points out the lack of good measures for evaluating condition in live animals. Despite many studies of various blood parameters, the author notes that most have proved at best weak correlates of condition.

Within its objectives, this book is a thorough and useful analysis of most commonly used indices. The list of references is comprehensive and the author offers a balanced assessment of each index. Huot should be credited for his emphasis on reproducible measurements useful to field personnel often working with considerable logistical constraints. This book is a useful update to the earlier reviews of this subject cited in the book. A few studies of body condition in caribou, particularly from the Fourth International Reindeer/Caribou Symposium and from 1987 would have been useful additions, but inevitably a review in a rapidly expanding field will be dated almost as soon as it is printed. The study of Reimers and Ringberg (1983), which is one of very few studies in which chemically and anatomically determined fat are related to an index (back fat) in reindeer, should have been noted.

The book could have been improved in some areas. Other reviews in this area have provided good line drawings of recommended measurements, and consideration could have been given to similar drawings, particularly if wildlife managers are to make use of this book. The kidney fat index is discussed, but the lack of a good relationship between kidney weight and body weight, and the lack of validation of this relationship in many species, might have been more thoroughly discussed. The kidney fat index (as opposed to kidney fat weight) is suspect in any animal for which this relationship is unknown. The technique developed by R. Hofmann for measuring rumen papillation as a measure of recent diet quality could have been included.

The author could have brought out the theoretical underpinnings of this field — principles of growth, development, and compensatory growth — more strongly. Conceptual reviews of growth and development and compensatory growth are available in the literature but were little used here. The number of controlled studies of growth, development and nutritional stress carried out over the years with domestic ruminants dwarfs that available for any wild ruminant, and this wealth of knowledge has not been fully explored, either in this review or in most studies of body composition in wild ruminants. Huot does recognize the severe shortage of even basic studies of body composition in wild ruminants in North America. The evaluation of diet quality might have been more fully developed.

The review is generally quite readable. There is the odd misspelling and grammatical error, but these are not a major distraction. The summary table is conveniently laid out for quick reference.

This book can be recommended to biologists, students and managers interested in the field. The price is not overly high, but other similar reviews have generally been available as reprints, and the length of the review seems closer to that of a long paper than to that of a book. Academics might look for a stronger theoretical development, and wildlife managers might look for diagrams illustrating key measurements. Dr. Huot should be commended for his effort to evaluate a growing field.

REFERENCE

- REIMERS, E., and RINGBERG, T. 1983. Seasonal changes in body weights of Svalbard reindeer from birth to maturity. *Acta Zoologica Fennica* 175:69-72.

Jan Adamczewski
Department of Biology
University of Saskatchewan
Saskatoon, Saskatchewan, Canada
S7N 0W0

THE ARCTIC GRAIL: THE QUEST FOR THE NORTH WEST PASSAGE AND THE NORTH POLE 1818-1909. By PIERRE BERTON. Toronto: McClelland and Stewart, 1988. 671 p., 44 maps, illus., index, bib. Hardbound. Cdn\$29.95.

The primary objective of the naval expeditions that left England between 1818 and 1845 was not that of pure geographical discovery, but of sailing a ship through from the Atlantic to the Pacific Ocean by a route north of the American continent — and before any other nation did so. Parry's success in reaching Melville Island in an exceptionally open season in 1819 led to over-confidence, in spite of the comparative failure of later voyages.

The loss of the Franklin expedition, which sailed in 1845, was a profound shock to the nation in general and to the Navy in particular. The potential for disaster should have been realized, but the warnings were ignored. In the four preceding voyages to the Arctic, Parry's *Fury* had been wrecked, John Ross's *Victory* abandoned, and Lyon's *Griper* and Back's *Terror* had narrowly escaped loss with all hands. Ross's crew had survived four winters in the Arctic and had at length found their way to safety on foot and in boats after their ship had been inexorably frozen in; this was taken as sure evidence that a long stay in the Arctic was not to be feared. Ross's crew, however, was small — only 21 when they abandoned their ship. Moreover, their survival had depended much on the fresh food they had obtained with the help of Eskimos and game that they had shot themselves. When supplies of fresh food were only intermittently available, they soon suffered from scurvy, even though they had good supplies of tinned food. What chance had Franklin's crews, 130 strong, if they became frozen in, especially should that occur where there were no Eskimos and game was short? That was what happened.

A long search followed, and the Admiralty was much criticized for the complete lack of success of the search in spite of the enormous resources devoted to it. First news of the fate of the expedition was obtained through Dr. John Rae of the Hudson's Bay Company, who was travelling with a small party, not to search for Franklin but to complete the survey of the arctic coastline. This news was received from the neighbourhood of the Great Fish River, which was well distant from Franklin's prescribed route and which he had reached through a hitherto unknown channel, Peel Sound. Despite all that has been written, the Admiralty search to the west and north of Barrow Strait seems perfectly logical in the light of Franklin's instructions and the evidence available at the time.

During the course of the search, hundreds of miles were covered by travelling parties using man-hauled sledges. The Navy has been criticized for not learning to use dog teams, for not being able to live off the land as men like John Rae did, and for not adopting native clothing more suited to the climate. These are all valid criticisms; the naval officers had their blind spots, but it should be recognized that they had been trained for the sea, and it was in that element that they expected to operate.

At the end of the great search, several northwest passages had been discovered, but no ship, not even a boat, had passed through any of them. On the other hand, thousands of square miles of arctic Canada had been delineated and added to the maps. It was a remarkable chapter in the history of the Royal Navy.

A new era of exploration started when Elisha Kent Kane passed through Smith Sound in 1853, nominally still searching for Franklin, but in reality hoping to reach the Open Polar Sea, which was, by some, believed to surround the North Pole. He and those who followed him up this "American route to the Pole" were (with the exception of the ill-conceived Nares expedition) not professional sailors, but highly individualistic adventurers. They certainly found plenty of adventure, many of them died as a result of inexperience and bad management, and survivors owed their lives largely to the support given to them by the polar Eskimos — the Arctic Highlanders, as John Ross had called them in 1818.

Across this northbound flow passed, from east to west, the efficient professional Norwegians — Nansen drifting across the Arctic Ocean, Amundsen successfully navigating a northwest passage and Sverdrup.

Finally, two men, in the same year, 1909, claimed to have reached the North Pole — Frederick Cook and Robert Peary. The claim of the former, a genial charlatan, was soon disproved. The latter, a brave man and a meticulous organizer but a selfish, aggressive paranoiac, was for long honoured as the "discoverer" of the North Pole. Few people believe that today.

The author has told the complex story with great skill. The book is a long one but, even so, it is astonishing how much detail of the many expeditions he has managed to include. Its outstanding merit, however, lies in the manner in which the author interprets and assesses the characters of the explorers themselves, as a result of his study of published works and private diaries and letters. He has his own heroes — Jane Franklin, John Rae and the Eskimos, for example (and who would quarrel with any of those?) — but he is no debunker of the traditional heroes. He is scrupulously fair, and if he records a frailty in a man, he will also record his strengths. Readers will not necessarily share all his judgements, but they are unlikely to disagree with many of them. The cast of characters is a fascinating one that few novelists could invent, and the story, indeed, often reads like a novel.

The book is well printed. There are a general map and 43 good sketch maps within the text. The end papers and chapter headings are embellished with attractive sketch portraits, and there are 13 other illustrations. There is a good bibliography of published and unpublished sources and an index.

Every polar enthusiast should have this excellent book in his library, and it is to be hoped that it will reach many new readers. They could not have a more comprehensive and entertaining introduction to the subject.

M.J. Ross
The School House
Chippenham
Ely, Cambridgeshire, CB7 5PP
England

Not since the days of *Canada and Its Provinces* have so many of this country's most prominent historians shared their vision of Canada's past. With the publication of this volume, the Canadian Centenary Series — an ambitious if interminably prolonged publishing initiative — is at last complete. The series is not bound together by a single interpretation or historiographical approach; the volumes cover specific time periods and regions and generally reflect the thinking of middle-of-the-road, traditional historians over the past 20 years. While the series has generally been praised for its comprehensive treatment of the available literature, it has not shown much evidence of historiographical innovation or methodological flourish. Rather, it has been characterized by solid and reliable works offering a contemporary assessment of the issues of Canadian history — or at least what was contemporary at the time each book was published. Morris Zaslow's second volume in the series (the first, *The Opening of the Canadian North, 1870-1914*, was published in 1971) is very much in this tradition.

Before discussing the book, it is important to draw attention to the crucial statement made about the Canadian North by the original editors of this series, neither of whom, unfortunately, lived to see it completed. Two of the 19 books in the series (or 3, if Tryggvi Oleson's controversial *Early Voyages and Northern Approaches* is included) have been devoted to the Canadian North, despite the fact that the region is sparsely populated and has been all but ignored by most of the historical profession. With the exception of Morris Zaslow and a small band of northern enthusiasts, few historians have paid much attention to the issues and concerns of northern Canadian history. All too many histories of Canada barely mention the region. The editors of the Canadian Centenary Series, therefore, are to be congratulated for stepping outside of the historical mainstream to bring the North to the attention of Canada's historical community.

That there is a northern historiography at all is due in large measure to the work of Morris Zaslow, Professor Emeritus of History at the University of Western Ontario. *The Opening of the Canadian North* and Zaslow's other work did much to set the historiographical agenda for northern studies in this country. Zaslow has viewed the North largely through southern eyes; he is interested primarily in the motivating forces of southern action and is less concerned with the evolution of northern society. Through this emphasis, transmitted to his graduate students, he has created what has been called the "Zaslow school" of northern history — an approach to the subject that has dominated it for the past twenty years. Professor Zaslow has done much to shape the definition of the North itself. Avoiding the traditional association of "the North" with the Arctic, he has drawn our attention to that vast expanse he calls the "middle North" — the sub-Arctic band that stretches from the Yukon to Labrador, making up more than half of Canada's land mass. His steadfast insistence on a broad definition of the region has ensured coverage of the provincial norths, a region sadly ignored by this country's regional historians.

The *Northward Expansion of Canada* is an authoritative book, a work to be consulted rather than skimmed; those looking for thrilling tales from the high latitudes, in the style of Pierre Berton, will not find them here. Like all of Zaslow's work, it gives evidence on every page of exhaustive work in archival, primary and secondary sources. Because it is a work of analysis and reflection rather than a polemic, it should remain in the canon of important works about this country long after more popular nonce-books on the subject have been banished to the remainder tables.

A caveat must be noted. Zaslow seems at times to stretch the definition of the North past the breaking point. It is one thing to include the "middle North" in the book, though he defines it very broadly, but when he takes as an example of the debate over Indian enfranchisement a quarrel between the federal government and the Six Nations, he goes too far. The Six Nations live closer to the equator than to the North Pole and are surely not "northern" by any Canadian definition of the word.