

Berkes avoids exaggerated claims for TEK, and instead points the way to an integration of knowledge systems. In a challenging concluding chapter, he suggests that the lessons we should be learning from traditional management systems include a more pluralistic approach, the importance of community-based management, and the importance of ethics in resource management.

Nonetheless Berkes frequently notes the philosophical and epistemological differences between TEK and a somewhat narrowly characterized “Western science.” TEK certainly provides a useful antidote to the positivist-reductionist variety of Western science. But is the broad spectrum of science today really driven by “mechanistic, linear, Newtonian science” (p. 22), or by Cartesian thought (p. 34, p. 154), or by the ideas of the Enlightenment (p. 35)? Berkes makes much of the separation in Western thought between humans and nature. Yet the critique of this separation has in fact arisen from other traditions of Western thought and is advanced not primarily by those who have TEK, but rather by those who (even if inspired by TEK) are well trained in the sciences and in philosophy. Adaptive management can just as well be seen not as contrary to Western science, but as an outgrowth of it. There is certainly a case to be made that the rise of scientific resource management in the first part of the 20th century was closely related to, and conveniently served the needs of, distant and centralized authorities in an era of displacement and control of aboriginal peoples. But that is a story about economics, politics, and culture, not only about science, and needs to be the subject of another book.

Despite the title of the book, the notion of the sacred in ecology is not well elaborated. It is briefly alluded to as a unity of mind and nature (as opposed to industrialism and monotheism), and more frequently as a system of environmental ethics, but this is surely simplistic. Scientists frequently justify their endeavour on ethical grounds, not least among them the importance of rationality and the search for truth as antidotes to arbitrariness and tyranny, and as the route to human emancipation and equality. The realm of the sacred includes not only ethics, but also aesthetics, reverence, and faith, but these are barely mentioned.

Common property systems and community-based resource management systems, and the ways of thinking to which they give rise, are the exception, not the rule, in today's world. Those systems will not be part of any foreseeable future for most of the world's people, who now live in highly heterogeneous cities and towns, segmented by class, ethnicity, interests, and ideology, and who have little if any knowledge of how a naturally functioning ecosystem works or what effect their daily activities might be having on one, whether nearby or distant. In such a world, there does indeed need to be, as Berkes advocates, greater respect and understanding of TEK, as well as a more pluralistic approach to resource management. But there must also be more universal institutions, rules, and values by which the local and the global are integrated, because the local cannot remain isolated.

That is another challenge for effective and workable resource management and environmental conservation.

Peter J. Usher

*P.J. Usher Consulting Services
Box 4815, Station E
Ottawa, Ontario, Canada
K1S 5H9*

NARRATIVE OF THE ARCTIC LAND EXPEDITION TO THE MOUTH OF THE GREAT FISH RIVER IN THE YEARS 1833, 1834 AND 1835. By GEORGE BACK. Dartmouth, Nova Scotia: CD-Academia Book Co., 1999. Distributed by University of Toronto Press. ISBN 1-894127-07-2. Maps, illus., CD-ROM. Personal use, Cdn\$39.95; institutional use, Cdn\$112.00.

A member of the British Navy, George Back was both a skilled naval officer and a talented artist. He created beautiful watercolours and sketches, some of which were used to illustrate the accounts of three of his four expeditions in northern Canada.

The expedition described in this CD-Book was organized to search for Sir John Ross when he failed to return from the Arctic. George Back volunteered to lead this land expedition, but after reaching the staging camp on Great Slave Lake, he received the news that Ross was safe in England. The objective of the expedition then changed from rescue to exploration, and Back set out to explore the Great Fish River (now the Back River) and to chart the coastline. Rapids and other obstacles in the river, ice, and bad weather on the coast prevented him from adding much new information to the charts. However, Back did spend a great deal of time making detailed illustrations, maps, and journal entries that give us much insight into the people, flora, fauna, and countryside of this part of the North.

Back's entire original journal, including four maps and 16 illustrations, has been scanned at high resolution (600 dpi) for inclusion in this CD-Book. The CD format allows illustrations, pages, and maps to be reproduced accurately, giving us another tool for learning. Using a zooming tool, one can magnify map segments up to eight times and print them. Readers can also choose to read the journal in its original format, with its old-fashioned typeface, or in an easier-to-read modern typeface and design. Back's journal provides interesting reading. He describes people, places, and events in great detail and makes thoughtful observations about his companions throughout the journal, leaving readers with lasting impressions of the activities and interactions of day-to-day life at the time of his expedition. Observations and details regarding weather, geology, botany, and wildlife, precisely located by frequent latitude and longitude readings, are also fascinating.

It would be interesting indeed to hear the story from the point of view of the other people involved in the trip (e.g., the voyageurs, the Chipewyans, or the interpreters).

Readers should be reminded that Back's journal is a very subjective and one-sided account of the expedition!

The quality of reproduction in this CD-Book is excellent. However, readers do need to read the instruction manual, as it is not obvious how to navigate through the CD-Book. Once the reader is familiar with the tools of navigation, moving through Back's journal is a much simpler task. Words can be highlighted and searches are easily completed. If a reader is interested in only one aspect of Back's journal, it is very simple to focus on that one theme without reading the entire journal.

There seems to be a great contrast in media here, a journal which is over 100 years old versus a CD-Book made using the newest computer technology. Something seems to be lost when one is perched in front of a computer screen browsing through Back's journal, as opposed to sitting comfortably in a chair, book in hand. In the end, however, it is the content of this product that is of value. The fact that this material is presented in a CD format gives readers access to information that otherwise might seem overwhelming. How many of us would wade through the pages of Back's journal to discover what types of goods Back took with him to the East Arm of Great Slave Lake, for example? With CD format, one can search the text for key words or phrases.

As a CD-Book, Back's journal will reach the eyes of many students and other interested people who otherwise would not have access to such a rare book. This broad availability will measure the success of the product. I recommend this CD-Book. Teachers, students, researchers, and people with a general interest in this type of history will find it to be engaging and informative reading material.

Wendy Stephenson
Curator of Education & Extension Services
Prince of Wales Northern Heritage Centre
Box 1320
Yellowknife, Northwest Territories, Canada
X1A 2L9

PRINCIPLES OF INTEGRATIVE ENVIRONMENTAL PHYSIOLOGY. By G. EDGAR FOLK, Jr., MARVIN L. REIDSESEL, and DIANA L. THRIFT. Bethesda, Maryland: Austin and Winfield, 1998. ISBN 1-57292-108-0. 504 p., b&w and colour illus., bib., index, 5 appendices. Softbound. US\$60.00.

It is always a challenge to present physiology in an environmental context: to take it from the strict organ and cellular levels up to the animal living in its surroundings. To successfully make this leap, the author must have not only knowledge of physiology per se, but also a strong understanding of the environmental conditions that affect the animal. Furthermore, the author needs to emphasize that the animal must adapt to multiple stressors simultaneously.

Principles of Integrative Environmental Physiology is an excellent textbook that brings out all these points. Although not as broad as the classic *Animal Physiology: Adaptation and Environment*, by K. Schmidt-Nielsen (1997), this text provides much more detailed experimental data. As a consequence, it reads like primary literature at certain points and, even with over 500 pages of text, some sections seem so detailed that the overall essence of the chapter can be weakened. However, a choice must be made in this type of writing: more details or more overviews. In this case, the authors have chosen the former. This book, combined with a broader type of text such as Schmidt-Nielsen's *Animal Physiology*, would easily serve as a powerful set of readings for upper-level undergraduates and graduate students. In the preface, Folk notes that the primary work of Krogh, Kuno, Dill, Scholander, Irving, Schmidt-Nielsen, and Griffin is covered in this book, and thus the student sees the lineage of environmental physiological thinking, especially in Chapter 1, which deals with the history of this field.

When I teach environmental physiology, I usually try to point out the major areas in which the environment affects the organism, such as obtaining oxygen, water balance, and temperature regulation. In a single semester, one cannot cover all these influences and selections must be made. In this book, Folk et al. start with the radiant environment, next discuss biological rhythms, and then cover temperature quite extensively in the following four chapters. Thus temperature takes up almost half the text. Chapters 8 (Altitude) and 10 (Pressure) are classic discussions, and I found the additions of chapters on aerospace (Chapter 9) and human impact on the environment (Chapter 11) fascinating because one does not usually find these in general physiology texts. Consequently, those who have a tendency or a need to teach temperature-based environmental physiology will want to use this book. The single chapter on biological rhythms is very detailed and the best that I have seen in a general text. The last four chapters are good introductions to altitude, aerospace, pressure, and human impacts, but together they cover less than 100 pages and have nowhere near the depth of the almost 200 pages devoted to the chapters on temperature.

I found specific sections of the book very strong and others confusing or vague. For example, in the section on the radiant environment, the units of UV wavelength keep changing between millimeters and nanometers in the text and figures. While the values are correct, it is hard enough to get students to understand dimensional analysis without switching units. Some plots and figures probably stood very well in their original publications, but when extracted and put into this text, they need much more explanation. For example, Figure 3.14 is supposed to show periodical movement by a lugworm. From both the text and the figure legend, I cannot figure out what these data show: they are clearly some sort of rhythmic physiological recording, but with no axes and no mention of what was actually measured, I am left wondering what was recorded. The use of