

first on the natural history of the polar bear; the second on the rapport between polar bears and the Inuit. That latter part is of particular interest to the social scientist since it deals with the bear in terms of what it represents in Inuit subsistence and ritual.

The chapter on natural history is concerned with the evolution of bears in general, with special emphasis on polar bears. While cursory for a specialist, it succeeds as a scientific popularization of the data.

Chapter 3 deals with polar bears on a pan-arctic basis. The sections on ecology and biological adaptations remain at a general level, suggesting that the author has not mastered all of the information. Data on bear ethology, though, were taken from a narrower pool of information and the author's treatment is definitely of a superior quality. Particularly fascinating is the treatment of bear social organization and communication.

Chapter 4 focuses specifically on the relations between the Inuit and polar bears. We learn here how the hunter became the hunted. There is an informative discussion of Inuit bear-hunting technology, and techniques, as well as comments on the sharing system among the Inuit after a successful hunt.

In Chapters 5 and 6, the author reveals his skills as an ethnologist. Randa does justice to the rich documentary sources and presents a superb synthesis of the rites surrounding the bear hunt among the North American Inuit. Moreover, his survey is accompanied by memorable quotes from Boas, Jenness and Rasmussen. The final chapter is concerned with mythology related to polar bears. It is not an analysis of myths but rather an enumeration of what oral tradition contains on various themes. What struck me most in this last section is the similarity of myths from regions as far apart as the Eastern Arctic and Siberia.

The book is stylishly written and can be confidently recommended to anyone interested in the importance of the polar bear in past and present arctic societies.

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**FOREST ECOSYSTEMS IN THE ALASKAN TAIGA: A SYNTHESIS OF STRUCTURE AND FUNCTION.** Edited by K. VAN CLEVE, F.S., CHAPIN III, P.W. FLANAGAN, L.A. VIREECK and C.T. DYRNESS. New York: Springer-Verlag, 1986. Ecological Studies Vol. 57. x + 230 p., figs., tables, index. Hardbound US\$47.50.

This is a major work, and predictably so because we have been familiar with its forerunners over the past decade — many scientific papers reporting the result of investigations into forests of the Alaskan taiga by members of the University of Alaska, Institute of Northern Forestry of the U.S. Forest Service, as well as other cooperating institutions.

The volume's editors, named above, are major contributors, all long-established scientists with extensive experience in the region, and the other contributors include foresters, biologists and soils scientists from Alaska, other states, Canada and the United Kingdom: from the University of Alaska — V. Alexander, M.M. Billington, J.P. Bryant and J. Yarie; from the U.K. — J.M. Anderson, J.P. Grime and O.W. Heal; from the University of British Columbia — J.P. Kimmins; from San Diego State University — W.C. Oechel; from Stanford University — P.M. Vitousek; from the University of New Brunswick — R.W. Wein; from the Institute of Northern Forestry — C.W. Slaughter, R.A. Werner and J. Zasada.

The city of Fairbanks, site of the University of Alaska and the Institute of Northern Forestry, is uniquely situated for research into the boreal ecosystem. It is located centrally within the interior Alaskan taiga, and it has a long history of ecologically oriented studies dating back at least to 1919. There has been a burgeoning of environmental

research since about 1950, including the work of such noted soils and forest scientists as Péwé, Lutz, Hopkins, Kellogg, Tedrow, Rieger, Benninghoff, Heilman, Wilde and a host of others representing many disciplines and too numerous to name.

The consequence has been the accumulation of a wealth of pertinent information on the ecology of the region, despite the fact that the entire region is, relatively speaking, remote from the rest of the United States and, one must admit, quite distant from the usual conceptual horizon of ecologists elsewhere.

Then in the period 1975-80 there began an intensive study of interior Alaskan forest ecosystems, resulting in a most impressive series of scientific papers appearing in many of the appropriate journals, and in 1983 an entire issue of the *Canadian Journal of Forest Research* was devoted to a summary of the findings in the form of a series of papers by the participants detailing the methods, results and implications of what was surely a most impressive ecosystems analysis.

With the current volume we now have a concise distillation of these findings; more importantly, we have the interpretations of those who carried on the study, conclusions that may earlier have become buried under voluminous data, or implied rather than stated, and perhaps not placed in full relationship to other aspects of the study. This book, in summary, describes the environmental parameters that characterize major forest types of the Alaskan interior, emphasizing such critical factors as soil temperature and moisture, organic matter accumulation, decomposition and soil chemistry, all as they correlate with ecosystem structure and function.

The book is surely a fitting culmination of one of the major research programs in the field of ecology in recent times, equal to any of the well-known IBP studies that have resulted in treatises, for example, on the arctic tundra and the American prairies (Brown *et al.*, 1980; Risser *et al.*, 1981), and, it is to be hoped, prologue to the filling in of remaining gaps in knowledge revealed by the analysis and, ultimately, to discerning the critical factors that limit forest development at various successional stages — in short, the kind of information needed to model, and manage, the forests for whatever ends are considered desirable for conservation of the resource on a permanent and long-term basis.

The effort, thus, is not a study of the synecology of the taiga plant communities but is, rather, a quantitative analysis of the structure and function of major forest ecosystems, and as such the book should not be criticized for something it did not attempt, even though the expectation, or preference, of reader or critic might have been more directly satisfied had it done so. My own preference leans toward classical community ecology, seasoned modestly with palaeo, and evolutionary, interpretations, as well as chorography of past and present communities and their responses to the environment. But this preference is, in a sense, a holdout against the march of time, with ecology in an early post-descriptive phase in which we search for correlations and causes of the response of populations to environmental factors and events.

There is, however, enough in this book to satisfy even the most rigid synecological traditionalist, for here is abundant supporting and confirmatory evidence for our fine traditional beliefs — such as that climate is the underlying factor at work in establishing major vegetational zonation. But the work of Van Cleve *et al.* is, in final analysis, not distributional and classificatory but rather ecosystematic, with emphasis not on the individual species (other than the trees, which define the forest types) but rather biomass and the controls that govern the ecosystem processes — soil chemistry, microbiology, mineralization, recycling of nutrient minerals, and so on.

As Van Cleve and Yarie point out in the chapter on the interaction of temperature, moisture and soil chemistry: "The principal emphasis in this research has been to examine control of system processes among forest types. In this regard, temperature played the role of dominant controlling environmental variable." The results of the analysis indicate that, in terms of the indices of ecosystem function, temperature controls annual tree production, element uptake, litterfall biomass, element recycling, litter decomposition, forest respiration. In the book, all of these various aspects are, of course, delineated in great detail and,

as the major contribution of the whole research program, in quantitative terms applicable to computer modelling and analysis.

As O.W. Heal and P.M. Vitousek point out in their introduction to the final section of the book:

The taiga ecosystems in this region are exceptional in that their relative simplicity allows a clear expression of the importance of biotic processes. However, an important conclusion of the taiga study is that these systems are not unique in their patterns of production, decomposition, or mineral cycling. Instead, they fall on a continuum from tropical through temperate to taiga forests. . . . Rather than describing the unique features of an unusual region, the taiga ecosystem study has used the clarity of the state factors to carry out an unparalleled test of ecosystem theory.

The book is, in organization, thrice divided, each part with an introduction: Part One, the nature of the taiga environment — climate, forest distribution, regeneration of trees and tall shrubs, fire ecology; Part Two, environmental control over ecosystem processes — nutrient availability and use, nitrogen fixation, role of bryophytes, microbial activity and mineral availability; Part Three, environmental controls over ecosystem processes — effects of temperature, moisture and soil chemistry on nutrient cycling, growth and yield modelled, phytophagous insects and browsing mammals and their effects upon plant succession.

The book is printed and produced to endure, in the style of the other *Ecological Studies* series by the publishers. Errors seem few, with notable exceptions — my name is misspelled in sentence two of the Introduction! A map of Alaska would be helpful, and the caption to Figure 1.1 states that one is present as an inset to a world map — but is nowhere to be seen. But no matter, such lapses are few and not of great concern.

Probably at some stage in the course of a lifetime, one wonders if any great works will appear in one's field that will, one day, be considered classics. If there are, I would expect this book to be among them. For individuals more interested in the past and present vegetation of the region, as well as adjacent regions, Ritchie's *Past and Present Vegetation of the Far Northwest of Canada* (1984) should satisfy their requirements. Together, these books say all that needs to be said for the present about the composition, structure and function of the past and present vegetation of the region.

But a word should be said for those scientists working in other regions of the boreal zone, across Canada and, moreover, in Eurasia. There are great repositories of knowledge about the boreal ecosystem, at least throughout Canada, in the universities and government programs, sufficient in many instances for other definitive regional synthesis such as those discussed above.

Without codification, condensation and summarization this knowledge will remain largely untapped, undisseminated, parochial, unavailable for comparison with that of other regions, and it should be considered incumbent upon policy makers in the regional centers to make arrangements for the publication of regional ecosystem analyses in a form suitable to wide distribution, such as the *Ecological Studies* of Springer-Verlag.

In many Canadian centers there is an accumulation of relevant knowledge of value biogeographically, as well as in terms of forest economics and wildlife conservation — plants, mammals, birds, fish, all resources that are, and will continue to be, invaluable to Canadians and, moreover, to the entire world as ecosystem.

Ecological knowledge and, better, wisdom has become an essential ingredient of the world scene and must now continue to be, if we as a species are not to become simply another of those who raced to extinction after a brief moment of dominance, huge biomass and inadequate intelligence. Some of the recent Canadian volumes are of value, and they are a step in the right direction, but they are compendia of essays, interesting and useful in themselves, and they lack an essential central focus. They are not deliberately coordinated aspects of a single ecosystem analysis. The material exists, it must now only be utilized (Wein *et al.*, 1983; National Research Board of Canada, 1975; Fuller and Kevan, 1970; Olson *et al.*, 1984).

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COLLECTED PAPERS ON THE HUMAN HISTORY OF THE NORTHWEST TERRITORIES. Occasional Paper No. 1. Edited by MARGARET JEAN PATTERSON, CHARLES D. ARNOLD and ROBERT R. JANES. Yellowknife: Prince of Wales Northern Heritage Centre, 1985. 167 p. No price indicated.

The Prince of Wales Northern Heritage Centre has a Canada-wide reputation for integrating the insights of northerners with those of trained researchers in the retrieval and dissemination of cultural information relevant to the North. For example, the Mountain Dene from Fort Norman built a moose-skin boat for the museum and documented on film its construction and use. Professional conservators and museologists then prepared the boat for display. Much of the prehistoric exploration sponsored by the centre uses ethnoarchaeological techniques allowing the archaeologist to incorporate the expertise and knowledge of the local persons. In these ways the complexity of human history in the N.W.T. is unfolding in a manner tying the present to the past. The *Collected Papers on the Human History of the Northwest Territories* was an appropriate publication with which to celebrate the centre's sixth anniversary. Like the centre, these papers provide an opportunity for lay and professional researchers to share their knowledge and insights and to emphasize the continuity between the present and the past.

The collection begins with a study of government recreational programs by Victoria Paraschak, who concludes that programs should incorporate mainstream and traditional activities. The same conclusion is reached by Sally Cole in her examination of the role of education in the lives of contemporary Inuit youth. William R. Morrison examines the early role of the RCMP in maintaining Canadian arctic sovereignty. Robert R. Janes and Joe D. Stewart describe the cooperative efforts of archaeologists and conservators to preserve and protect Captain Henry Kellert's store house built in 1853 on Dealy Island. This article is especially interesting as it incorporates the feelings and thoughts of the investigators while working at the site. This approach creates, for the reader, a sense of continuity with the past and gives an impression of what it is like to work at an historic site. Most articles describe events since the coming of Europeans. Donald W. Clark describes the historic period but emphasizes the prehistoric periods of Great Bear Lake region. In addition, Clark explains how archaeologists analyze their information. Barbara J. Winter also describes material culture but approaches the subject from a more contemporary view. Winter describes the quill bands that Dene women use to decorate traditional clothing.