

POLYNYS IN THE CANADIAN ARCTIC. Edited by IAN STIRLING and HOLLY CLEATOR. Ottawa: Canadian Wildlife Service, 1981. Occasional Paper No. 45. Cat. No. CW 69-1/45E. ISBN 0-662-11536-8. 73p. Softbound. Gratis. (Available in English or French.)

This highly readable and useful review assembles and integrates, for the first time, data on the geographic, physical and biological characteristics of polynyas which are known to occur in the Canadian Arctic.

The review is one of a series of high-quality technical reports produced, or edited, by scientists of the Canadian Wildlife Service of Environment Canada. It is organized into six sections, of which five have literature citations listed at the end.

The list of eleven contributors to the review reads like a Who's Who of the Canadian arctic ecological research community. Based on approximately 350 references, the review discusses these works (some of which date back to the early 1800s) within a broad context which recognizes the modern realities of non-renewable resource extraction, production and transportation. As some of the reviewed literature is from unpublished reports or derived from the work of private companies operating, or proposing to operate, in the region, the reader is provided with ready access to information which may be otherwise difficult to obtain. The truly significant and highly useful point about the review is that the authors integrate and interpret a broad range of studies and so describe the admittedly rather sparse information available to us.

The introduction sets out the premise that while the distribution of recurring polynyas may be quite localized, accounting for only a small proportion of the total arctic marine habitat, their influence on the survival of arctic marine birds and mammals appears to be profound.

Stirling sounds a clear warning to those involved with environmental management and protection in the Canadian north by noting the pronounced lack of quantitative data (and hence our poor understanding of the ecological significance of the polynya to individual species) available to us at a time when significant arctic marine development plans are being addressed in Canada. Echoing a comment made elsewhere (Stirling *et al.*, 1979), he notes the necessity for continuing arctic ecological baseline studies, particularly on polynyas: "... we may be able to develop some predictive capability to aid in future environmental assessments. However, it cannot be emphasized too strongly that the available time is running out."

It is ironic that as a result of Canadian government policy, which placed the onus for environmental study in the Canadian arctic frontier regions on industrial developers (chiefly oil and gas companies), by far the greatest amount of up-to-date scientific data now resides with those companies. Some of these studies (for instance Imperial Oil *et al.*, 1978) have been released to the scientific community in the normal course of environmental hearings in support of applications for offshore drilling or transport (Environment Canada, 1978, 1979, 1980). Other data, which are still being assembled into integrated impact assessments, understandably will not be released until the submissions are completed. Much to their credit some companies have begun to synthesize the vast amounts of data collected under their field research programs so as to make them available to the scientific literature in advance of hearings (Petro-Canada, 1979) or subsequent to them (G. Glazier, pers. comm.). The cruel irony is that clearly the proponents for these developments will have a much more extensive base of data for future hearings than the government scientists presently have available to them. To some, however, this dilemma raises questions as to the validity of the existing hearings process: how can environmental regulatory or enforcement agencies properly exercise their mandate for long-term management strategies when they cannot verify, or properly respond to, data presented in support of applications for arctic developments?

The limited nature of the base of data available to the authors of the review is a recurrent theme throughout the six sections. In Canada, it has long been accepted that "impact studies" should precede industrial development in the Arctic. It is, unfortunately, also a fact that the importance of continuing studies or post-development assessments is often lost in the glare of publicity focussed on pressing or "new" developments. Appropriately, therefore, Stirling notes that the purpose of the review is to assemble the "scattered body of information on polynyas in one place not as a definitive work but as a starting point for 'more thorough, integrated, interdisciplinary research.'"

The second section (distribution of polynyas) is particularly useful in that it draws on a wide literature ranging from the venerable "Pilot of Arctic Canada" to rather more recent satellite (NOAA and Landsat) imagery through to unpublished works by the late Dr. F. Müller on the

North Water polynya of Baffin Bay. The several maps and illustrations further enhance this section as a valuable summary reference for researchers.

Section three, dealing with the physical causes and biological significance of polynyas, is a most useful summary. Once again, it demonstrates the tremendous breadth of knowledge of the author (Dunbar) who, in a highly readable style, reviews, and masterfully integrates into a whole, data ranging from M.V. Lomonosov's observations of the North Water in 1764 through to the most recent literature on ice dynamics. Dunbar then sets out an excellent summary on the biological effects, and significance, of polynyas. The section ends with a prioritized list of research needs, one which government and university research administrators would be well advised to read and, one hopes, act upon.

The last three sections on marine mammals, arctic colonial seabirds and seabirds present a valuable overview of the dependence of many species on polynyas. Sadly, once again there is little work on ecological relationships available to the authors and hence much of the interpretative sections are based on data which are rather more qualitative than quantitative.

The prehistoric ties between man, polynyas and the animals that frequent them is an interesting aspect touched upon by the review. There is one conclusion, however, which strikes across scientific and resource management lines: "It is clear that human utilization of marine mammals in polynya areas is as great a potential threat as industrial activities, although it should be the easiest to ameliorate through modification of management practices" (p. 56). It remains to be seen if Canadian arctic resource management agencies will be able to successfully grasp this difficult nettle.

The vital importance of recurring polynyas to arctic seabirds, particularly in spring, is highlighted by Brown and Nettleship. They note that, with only one exception, there are no major seabird colonies of the Canadian arctic region not adjacent to recurring polynyas. Prach *et al.* note the critical nature of associated leads as staging areas for seabirds, particularly prior to the breeding season.

The review as a whole suffers somewhat from the lack of a comprehensive bibliography at the end, in addition to those contained following each section. This, however, does not in any way detract from the impressive breadth of data reviewed. The paper is well presented with clear and, most important, scientifically useful figures. The authors have succeeded in that most difficult of tasks in preparing readable, yet scientifically sound, papers. The reviewer was impressed by the initiative and dedication of the authors, in difficult funding times, in producing this review. It should appeal to a wide audience from those generally interested in the arctic marine environment, to educators, industrial researchers and Canadian environmental managers and planners.

One hopes, as Stirling notes, that "this volume can serve as a stimulus for additional research on polynyas in the Canadian Arctic, and that new information will make this publication seriously outdated in a few years." While the publication of the research now in the hands of the oil industry will, undoubtedly, help to ameliorate this situation, a sustained recognition by government agencies of the value of continuing studies is of paramount significance. To quote the Environmental Assessment and Review Panel for Lancaster Sound: "... there are some very basic aspects of Lancaster Sound which can only be addressed by a relatively long-term research program and which should properly be the objective and responsibility of government programs ... present federal marine ecosystems research programs are not commensurate with the need. The lack of basic scientific knowledge was evident throughout the hearings" (Environment Canada, 1979:66-67).

As a final comment on many of the lingering questions about the management and funding of Canadian arctic research raised by the volume, I refer to the eloquent words of Macpherson (1981):

"Canada's twin northern conservation challenges are ... to find indigenous and innovative solutions to unique Canadian resource conservation problems and to place northern resource uses, including industrial uses, on a planning foundation."

It remains to be seen whether or not the existing federal arctic research establishment, part of which produced this volume on polynyas, will indeed receive the support necessary to do precisely that.

Editors' Note: The work referred to here, the Eastern Arctic Marine Environmental Studies program, has recently been published as a special issue of *Arctic* (Vol. 35, No. 1).

REFERENCES

- ENVIRONMENT CANADA. 1978. Eastern Arctic Offshore Drilling—South Davis Strait Project. Federal Environmental Assessment Review Office, Report of the Environmental Assessment Panel. 53 p.
- . 1979. Lancaster Sound Drilling. Federal Environmental Assessment Review Office, Report of the Environmental Assessment Panel. 127 p.
- . 1980. Arctic Pilot Project (Northern Component). Federal Environmental Assessment Review Office, Report of the Environmental Assessment Panel. 125 p.
- IMPERIAL OIL LTD., AQUITAINE COMPANY OF CANADA LTD., and CANADA-CITIES SERVICE, LTD. 1978. Environmental Impact for Exploratory Drilling in Davis Strait Region.
- MACPHERSON, A.H. 1981. Commentary: Wildlife conservation and Canada's north. *Arctic* 34(2):103-107.
- PETRO-CANADA. 1979. Initial Environmental Assessment—Proposed Baffin Bay Exploratory Drilling Program. 318 p.
- STIRLING, I.G., WALLACE, R.R. and GLAZIER, G.T. 1979. An environmental research and management strategy for the eastern arctic region: a discussion. *Northern Perspectives* VII(6):4-9.

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ATHAPASKAN CLOTHING AND RELATED OBJECTS IN THE COLLECTIONS OF FIELD MUSEUM OF NATURAL HISTORY
 By JAMES W. VANSTONE. Chicago: Field Museum of Natural History, 1981. Fieldiana, Anthropology, New Series No. 4. 86 p., illus. US \$7.00. Softbound.

James VanStone has been comfortable with a number of anthropological subdisciplines throughout his scholarly career, including archaeology, ethnology and ethnohistory. He is also a student of material culture, and this publication is yet another of VanStone's contributions to our understanding of northern Athapaskans in general and of their material culture in particular. His well-rounded intellectual perspective is apparent in what at first glance appears to be a rather typical museum catalogue.

The purpose of his book is to document and illustrate 31 items of northern Athapaskan clothing and related objects obtained in the Yukon Valley of Alaska near the end of the nineteenth century. These objects are contained in the collections of the Department of Anthropology at Field Museum of Natural History in Chicago. This book exceeds the normal requirements of a museum catalogue in a number of respects, and in so doing touches upon a variety of northern anthropological interests.

VanStone begins with a discussion of the scarcity of traditional northern Athapaskan clothing in museum collections. Although a number of museums do have some items of northern Athapaskan clothing, these pieces remain for the most part undocumented and unpublished. There are exceptions to this unfortunate state of affairs, including the Kutchin material in the National Museum of Man in Ottawa. Perhaps the most notable exception is the very valuable collection of Alaska Athapaskan clothing at the Peter the Great Museum of Anthropology and Ethnography in Leningrad. Appropriately, VanStone recently collaborated on the publication of this collection (Siebert, 1980).

The chapter describing the Field Museum's collection is prefaced with observations on the ethnographic context of Athapaskan clothing, many of which are relevant for groups in both Alaska and Canada. Drawing on the extensive ethnographic research of Catharine McClellan, VanStone remarks on Athapaskan modesty and the intimate connection between individuals and their clothing in some Athapaskan societies. These comments make the subsequent descriptions of the specimens doubly rewarding. This section concludes with a description of aboriginal Athapaskan hide preparation and sewing, a description that all northern Athapaskan archaeologists would do well to read for its detail and clarity. VanStone includes observations on the bone and stone tools that would have been used prehistorically. It is interesting to note that this tool kit survives to this

day basically unaltered among some Athapaskans in the Northwest Territories, except that metal has replaced the slate scraper blade.

The remainder of this chapter, which constitutes the bulk of the book's text, is devoted to detailed descriptions of the clothing and related objects. Accompanying these descriptions are excellent black and white photographic plates of all the objects, as well as 18 high-quality line drawings of sewing patterns, illustrating how various specimens were put together. Also included are several plates taken from early historical sources depicting Athapaskans in their native garb. These latter illustrations are a thoughtful addition, as they enhance the reader's sense of the historical ethnographic context.

The objects described include five tunics, six pairs of moccasin-trousers, one child's costume, four hoods, one cap, one decorated strap, two wristlets, one pair of mittens, one pair of gloves, three pairs of moccasins, two quivers, and four pouches. All the descriptions are detailed, clear, easy to follow, and conclude with a discussion. VanStone compares these pieces with similar ones from other Alaskan groups observed by early explorers, described by ethnographers, or illustrated in published museum collections. This is a good example of his thoroughness.

There is much to hold the reader's attention in these descriptive passages. For example, there is a discussion on the sex attributes of tunics based in part on observations VanStone derived from "experimental ethnography." This involved one of his female colleagues trying on a tunic, allowing various inferences concerning size to be made. I was also struck by the practical design of the child's costume. The mittens are sewn to the sleeves of the hooded shirt, with slits provided for the hands. Anyone who takes care of children in a continental climate can appreciate the wisdom of this design, as the problems of lost mittens and freezing hands are eliminated. Such a glimpse of cultural adaptation is even more interesting because of its continued relevance.

Hoods are another item of clothing which offer further insight into northern Athapaskan culture. VanStone writes that, with the exception of children's clothing, the attached hood was adopted after the coming of Europeans. It is thought that the attached hood, or parka hood, would have restricted seeing and hearing, an obvious disadvantage to forest hunters. One of the most interesting items in the collection is a detached hood, so heavily decorated with beading that it weighs 820 g (1 lb, 13 oz). It was undoubtedly a formidable object to wear.

Following the artifact descriptions and discussion, the book concludes with sections on ornamentation, clothing change, and attributions. These sections are rich in anthropological information and together form an appropriate conclusion. In discussing the decoration of clothing as the major artistic expression of northern Athapaskans, VanStone traces the changes in materials and motifs as a result of European contact in Alaska. He notes that following the general availability of beads among the Kutchin, only those persons who were regarded as poor used porcupine quills. Significantly, porcupine-quill work is presently undergoing a revival among some northern Athapaskan groups in Canada.

The discussion of clothing change leaves the reader with certain questions. Although VanStone refers to rapid acceptance of European clothing among aboriginal Athapaskans, further observations by him indicate that the situation was much more complex. He writes that aboriginal clothing styles had virtually disappeared throughout much of the Yukon River Valley by the end of the nineteenth century, yet also notes that the relatively isolated Tanana were still wearing moccasin-trousers in the early 1930s. His use of a variety of ethnohistorical sources underscores the true complexity of contact situations, belying the existence of tidy, unidirectional change.

The book concludes with a thorough assessment of the collection's provenience problems. Although the documentation is far from ideal, an approximate date and origin for the collection can be determined. No further precision beyond this is possible, however, as nineteenth-century collectors rarely bothered about specific documentation, and this collection is no exception. VanStone recognizes that exact cultural affiliations cannot be assigned and freely admits to the possible bias in attributing specimens to the Kutchin. Much more information is available on Kutchin clothing, both in the literature and in museum collections, making comparison much easier.

This book is noteworthy for VanStone's command of the ethnohistorical and ethnographic literature and the resulting fullness of the documentation. Such documentation allows the author to place the specimens in their broader anthropological context, thereby transcending the limitations of the inventory approach. His decades of research among northern Athapaskans are apparent in his almost casual thoroughness.