CARIBOU AND THE BARREN-LANDS. By GEORGE CALEF. Ottawa: Canadian Arctic Resources Committee, 1981. Published by Firefly Books, Toronto. 176 p. Hardbound. CAN $35.00.

This book contains the most complete collection of caribou photographs ever published, and they are, without doubt, the most beautiful caribou photographs ever published. The photographs illustrate a text that is, at times, inspired but at other times is somewhat purple. Calef skillfully tells a fictional narrative of the life of caribou throughout the year and interweaves this with a series of more sober, factual accounts. The technique is extremely effective in conjuring up visions and, for me, memories — of crouching in the snow and counting caribou while trying to keep the binoculars from frosting in the −40° air, of watching long files of caribou plodding along a tundra esker heading into the north-hanging sun, of watching a newborn fawn first struggle to its feet with its rubbery legs wide-braced, of the clacking, rattling roar of the hooves of one-quarter of all the caribou in Canada streaming around me under a forest of bobbing antlers. There are a few trivial errors in this part of the book: at one place the text describes the Bathurst region while the accompanying photographs are clearly of eastern Alaska or western Yukon Territory; there is a statement that wolverines kill *many* wild reindeer calves in Scandinavia when there are neither many wild reindeer *nor* wolverines there; the author repeats the old wheeze about the edges of caribou hooves in winter providing "excellent traction on slippery ice." These are but minor cavils.

After such an enthralling story for about 150 pages, the book falls all to pieces. At this point Calef embarks on a crusade to save the caribou, and, in doing so, ignores most of the past 30 years of caribou research. Basically his thesis is that wolves and native hunting have done in the caribou and in order to stem the decline we must eliminate natural and human predation. Shades of Jack Miner! Why do we always blame *them* and never *us*?

In order to develop his thesis Calef selects conclusions from the research literature that agree with his ideas but does not mention conflicting views. For example, he points out that caribou can, indeed, thrive on grasses and sedges. But he fails to emphasize that the examples he gives are from tiny, isolated areas on the fringe of caribou distribution, areas that have mild, maritime climates and that have nothing in common with the vast reaches of the taiga wintering ranges on the continent. He repeats the astonishing statement that forest fires help maintain lichen crops. Again, this idea originated in the context of the windy, wet, maritime vegetation of Newfoundland where fire can indeed be used to break the forest canopy and increase lichen productivity. It has no relationship at all to the lichen ranges in the dry, continental taiga.

Calef seems to be a member of that group of southern foresters that claims "Fire is good for the forest." He says fires have not increased in frequency in recent years and that they would have to increase to five or ten times their present frequency before they would begin to affect caribou food supply. Anyone who revisits old, familiar regions of the northern taiga after an absence of 20 or 30 years knows that it is nonsense to say that fires have not increased in frequency.

If we use the same range-evaluation procedures on caribou that tell us a given range in Colorado will support a certain number of cattle, then we will be dead wrong. As Calef himself describes (but apparently does not really appreciate), caribou, by their own actions, disturb the snow cover so that the theoretical carrying capacity of the range is markedly curtailed for the remainder of that winter. Using this concept of range use, I once measured and calculated the carrying capacity of some of the burned range in northern Saskatchewan. It was instructive to note that the snow-related carrying capacity was almost identical with the number of caribou we knew, from our aerial surveys, to be using the range.

Resource administrators and politicians are always on the alert for anything that justifies doing nothing or eliminating difficult activities. "Wilderness" fire-fighting is one of the most difficult of all government activities to do and to justify to an uncomprehending public. Administrators are delighted to have any excuse for cutting back on fire-fighting programs. The fallacious reasoning presented here by Calef has already had unfortunate consequences for caribou survival because it has influenced changes in government policy.

Calef puts his fact-selection process to good use in his advocacy of wolf control. He says "There is little doubt that wolves control the number of caribou," and thus ignores Mech's massive work that certainly indicated just the opposite. Calef says that "Wolves' prey consists above all of healthy young animals . . ." but back on p. 44 he states that ". . . calves and adults in poor condition usually constitute a high proportion of the wolves' victims." (Note that they are not food for another level in the food web but *victims*, a most anti-ecological choice of words.) But then, Calef also gives a warped interpretation of wolf population dynamics and says that wolves can rebuild their populations quickly from very low numbers but caribou cannot, even though two pages earlier he tells of one caribou population having a rate of increase that would double its size in five years! Calef attempts to sugar-coat his proposal for wolf control by stating that he does not mean wolf extermination or massive poisoning. He has not done his history homework. "Wolf control" programs have a way of degenerating into massive poisoning programs. They end in an orgy of killing wolverines, grizzlies, coloured fox, white fox, ravens, eagles, jays, etc. I recall how the former director of one of the infamous wolf control programs on caribou range in the 1950s said to me years later, "Doc, you were right. We shouldn't have started it. I couldn't stop it, couldn't turn it off when we wanted to." It is nonsense to state that the only way to eliminate the wolf from the tundra would be to eliminate the caribou. With modern technology we can extirpate any species we want to. And we know that a "little control" destroys the finely-tuned self-regulating population-control mechanism of a wolf population and causes it to explode in numbers. This nullifies the entire reason for the program except that it provides the excuse for more control.

Calef ignores the classic study by Parker (Canadian Wildlife Service Occasional Paper No. 10, 1971) which showed that the type of program advocated by Calef did not increase caribou numbers when it was tried in the late '50s. Calef brings in comparative data on muskox survival but nowhere mentions the mass of data from the Isle Royale moose-wolf studies. In fact, the Isle Royale results are just the opposite of what Calef supposes will happen.

Not only is there a biased selection from the scientific literature but there is an inordinate reliance on ideas and data in unpublished theses and government agency or consulting company in-house reports (the "grey literature") that have never undergone scrutiny and criticism by the scientific community. In fact, of Calef's citations after 1954 (the date of Banfield's classic study, the beginning of modern caribou biology) 27% are from unpublished sources not in the open scientific literature.

The last part of the book shows numerous other errors and inconsistencies. For example, on p. 152 Calef says that caribou are the only deer that have evolved to live in the Arctic. Quite true, but this book is solely about those caribou that spend over half their lives in the taiga, not the Arctic. On. p. 152 he says that caribou become more active as temperatures fall but on p. 155 he says that their basal metabolic rate drops by more than 25% from November on. On p. 156 he says that lichens " . . . grow widely on the poor soils of the boreal forest and tundra . . .", implying that lichens receive nutrients from the soil, but, of course, they do not.

The author clearly loves caribou, passionately and devotedly. I fear that his devotion to caribou has fogged his scientific objectivity and has prevented him from bringing his full faculties to bear on the problem. He has forgotten that "Those who ignore history are forced to repeat it."

Calef does have good advice regarding protection of fawning grounds, use of vehicles, interference with migration routes, overhunting, etc. He admits that if the lichens were killed by sulfur dioxide and the taiga cut for lumber and fence posts then the caribou would disappear, but for some reason he cannot see that fire kills lichens, too, and fire destroys taiga as surely as cutting for fence posts does.

The book is beautifully bound and produced. Probably because of its appearance it has received a number of uncritical, effusive and laudatory reviews. Such general acceptance by an unsophisticated public means the book probably has already set back rational caribou management by many years.

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KITOVAIA ALLEIA — DREVNOSTI OSTROVOV PROLIVA SENIAVINA [WHALEBONE ALLEY — ANTIQUITIES OF THE SENIAVIN STRAIT ISLANDS]. By S.A. ARUTIUNOV, I.I. KRUPNIK and M.A. CHLENOV. Moscow: Nauka, 1982. Academy of Sciences of the USSR, Institute of Ethnography of N.S. Miklukho-Maklai. 174 p. No price indicated.

This unpretentious book by three outstanding Soviet scholars presents us with an important addition to our store of data on prehistoric cultures

of the Bering Strait area and at the same time raises new questions about the Eskimo world.

The term "Whalebone Alley" refers to a unique monument on the island of Yttygran, off the southeast coast of the Chukchi Peninsula, at the boundary of historic Asiatic Eskimo and Chukchi settlement areas, but within the settlement area of proto-historic Eskimos. The monument consists of a large number of bowhead whale skulls and mandibles arranged over a large area in a strict geometric pattern, and associated stone and earth structures (to be discussed in more detail below). The authors' analysis of the site's surface structural features (no archaeological excavations have yet been conducted there), and the curious fact that no artifacts have been found in association either on the surface or in test pits, lead the authors to conclude that the locality was a sacred precinct associated solely with ritual practices of unknown character and used only at intervals by participants in the rites.

The book falls into two clearly defined parts: presentation of data (Introduction, chapters 1-4, and Appendix) and interpretation (chapter 5 and Concluding Remarks, p. 158-160). The discovery of the monument is described in the Introduction and on pages 3-7, with additional material presented in an Afterword (p. 160-163). A detailed description of the physical features of the monument is given in chapter 1, and the Appendix (p. 165-166) contains statistics on recovered whalebone remains. Other cultural remains on Yttygran Island and in immediately adjacent territories are discussed in chapter 2. In chapter 3, the authors discuss historic Asiatic Eskimo cultures of the southeastern Chukchi Peninsula, emphasizing tribal distribution, social and political structure, historic geography of the Seniavin Strait area, and the relationship between modern, historic, and prehistoric groupings and settlements. Chapter 4 is devoted to an analysis of the relationship between the monument and ethnographic data on historic and proto-historic Eskimo cultures, with special attention given to folklore, ritual, and examination of whalebone remains elsewhere. Changes in the geographic distribution of bowhead whales are discussed.

Interpretations of the possible function and cultural significance of the monument in the context of ancient Eskimo society are presented in chapter 5, entitled "Whalebone Alley and Ancient Eskimo Society". This chapter also includes the dating of the monument to late Punuk, in the Chukchi Peninsula from about the 14th to 16th centuries A.D.

Statements of a much more general order, encompassing the wider context of developments and changes in Eskimoan cultures from the Chukchi Peninsula to Greenland, are contained in a separate, brief, concluding section. Here the authors make the following points. The development of the Eskimoan cultures, since remote antiquity, has not followed the evolutionary model from simple to complex, nor has it remained stable. On the contrary, the cultural development "pulsated" with the changing ecological conditions, and devolution appears much more likely, especially in the realm of social and ideological structures. The authors reiterate their earlier expressed view that the Whalebone Alley "architectonics" indicate that "its significance far exceeded the limits of social needs of any isolated [single], no matter how large or extensive, economic community" and that the site was "a central sanctuary of a rather large scale entity [alliance] encompassing settlements not only on the Seniavin Strait but possibly in the adjacent territories" (p. 159). The associated cult they consider to have been esoteric in character, and though restricted to an elite, to have represented an ideological complex on which a large political grouping was based (p. 159-160).

The conclusion the authors reach is that the evidence of Whalebone Alley clearly demonstrates that the ancient Eskimoan societies of the Bering Strait area had a complex social structure, very different in character from the social structure of historic Eskimos and, in fact, more closely approaching the hierarchical social structure of the Aleuts and the Indian societies of the Northwest Coast. This contention is supported by the evidence of striking parallels in the art of Old Bering Sea people, Aleuts and Northwest Coast societies (see also Black, in press).

The presentation of the data is excellent: clear, concise and supplemented by a number of maps, sketches, and photographs. The monument was discovered in the summer of 1976 by a team from the Institute of Ethnography of the USSR, led by M.A. Chlenov. The following year (in the fall of 1977) a special team was dispatched specifically to reconnoiter the monument. This effort was brief, lasting only ten days. In 1979, a more extensive and intensive investigation was conducted. The investigating teams included specialists in archaeology, ethnography, history, linguistics, and ecology, as well as scholars with specific interests in ancient Eskimoan cultures and Eskimo social organization. Native residents participated at all times, as guides, field aides and interpreters. While the book was in press, in 1981, Chlenov and Krupnik, accompanied by artist S.A. Bogoslovskii, returned to the area and investigated the neighboring territory to the north of Yttygran, where they found indications that there might once have been similar structures. The new data permitted the hypothesis that Whalebone Alley is linked to the archaeological remains at Uelen: that is, the authors now conclude that the two geographically separate areas on the Chukchi Peninsula where ancient Old Bering Sea and Punuk sites have been found in the not too distant past constituted a continuous settlement area from Cape Dezhnev and the Diomedes to Cape Chaplin, Providence Bay, Sireniki and St. Lawrence Island.

The description of the site is based, as mentioned, on surface surveys, test pits, and mapping. Dating (p. 136-142) was based on comparison of sites and of the weathering patterns of whalebone from known sites, and on a limited number of radiocarbon dates. A sample of a mandible obtained at a depth of 80 cm gave the result 1690±30 (LE-1958), which corrected to a real date of 1628±30 A.D. Allowing for water contamination, leaching, and extreme porosity of the bone, the authors characterize the dating as late, possibly terminal, Punuk (p. 141).

Whalebone Alley extends for 800 m along the shore and ranges from 60 to 80 cm in width, occupying an area on a gravel spit which is 1-1.5 m above sea level. Formerly, this spit bounded a lagoon, now filled in. Whalebone Alley begins just above 0.5 m above the pebble beach. Here, for a distance of about 300 m, bowhead skulls are arranged in 15 groups, disposed at regular intervals of 10 m and, more rarely, 20 m. The authors surmise that the intervals represent a length and doubled length of the traditional *umiaq* and that each skull group marked the landing place of a specific whaling crew. In 13 of the groups the skulls are arranged parallel to and facing the shoreline; in the two terminal groups, one at each end of the alley, the skulls are perpendicular to the shoreline. All of the skulls are dug in at the snout to a depth of 50-60 cm; each is secured underground by two large boulders chinked with large gravel or pebbles. Each group consists of either four or two skulls in a strict geometric order — for several groups the authors were able to reconstruct the order with a great degree of probability (p. 11-26).

A bit farther inland there is a row of mandibles, all lower except in the center where upper mandibles are found. These originally were all placed upright. A total of 34 mandibles survive, of which 13 are *in situ*. Their distribution is characterized, in comparison to the orderly arrangement of the skulls, as irregular or even chaotic, but this may be the result of destruction by elements and removal by later generations of humans. On the basis of their 1981 investigations, the authors believe that originally pairs of mandibles might have been arranged to form arches. One such arch remains intact (Fig. 30). The mandibles are large, weighing 250-300 kg each, and the authors estimate that the labor of four or five adult men was required to erect them. The mandibles were dug in to a depth of 0.5 m or more, and secured by boulders chinked with pebbles (p. 26-35, 162).

Several features of stone and earth were discovered nearby, but the authors consider only some of these to be clearly associated semantically and temporally with the whalebone remains. A semicircular, amphitheater-shaped area bordered by large stones and slabs placed upright, with a fireplace or firepit in the northeast corner or end, is located centrally in respect to the whalebone remains. A complex path, or *dromus,* links this focal point with another stone-and-earth structure which the authors term "the shrine" or "the main sanctuary", characterizing it as indubitably the "functional center of the monument" (p. 41). The path begins near a mandible post marked on the maps and in the inventory as M1, within the concentration of mandibles in the center of the alley. It is one meter wide, paved, and runs at first in a straight line up the talus for 28 m and then along a slight ridge. The surface of the path in this sector is elevated 0.4-0.5 m above the level of the talus. Then the path is sunk into the surface to a depth of 0.4-0.5 m and is covered with sod. This section, too, is up to one meter wide. The third section of the path curves along the stone "shrine" for a distance of about 20 m. It is bordered by large boulders which protrude upward to about 80 cm and "forms an artificial drain" [or ditch (*zholob*)] (Fig. 39).

The "shrine" or "sanctuary" is a level, circular area, bordered by large boulders 30-40 cm high. In the center there is a roughly trapezoid 50 × 80 cm slab (p. 41). At the south wall the authors found a large white quartz boulder and fireplace composed of small stones. Scattered within the stone ring were a large number of walrus bones and whalebones.

In addition to these striking features, a number of small meat-storage pits, considered by the authors characteristic of Old Bering Sea and Punuk, are in a row between skull groups no. 2 and no. 7 (p. 35-36). Traces of individual butchering and/or feasting sites have been found in association (p. 36). A group of 120 meat-storage pits, some funnel-shaped

(0.5-1.5 m deep), some round or oval, was found on the scree which "reaches Whalebone Alley from the peak Amaralyk" (p. 38). Here mummified remains of walrus meat and possibly also of whale have been found. Such storage pits, though not used by historic Asiatic Eskimos, are known to them and have a special name, *pygvigit* (p. 38).

Below the talus, close to the lines of skulls and mandibles, between the mandible posts marked P and Q, four ring-shaped structures 1.5-2 m in diameter were found, bordered by large boulders. To the southwest of the last of these there is a rectangular 3 × 3 m structure of large stone blocks. The remaining height of the walls ranges from 0.8 to 1.6 m. The entrance to the structure is oriented toward the sea and is flanked at a distance of 1.5 m by two very large boulders oriented the same way as the whale skulls. The authors consider this to be a remnant of a stone house, a surface structure uncharacteristic of the historic Asiatic Eskimo but reminiscent of ancient dwellings found in the Bering Strait area (p. 36, Fig. 35). However, since there are signs of relatively recent use, the authors do not exclude the possibility that this house structure is not related to Whalebone Alley.

Space restrictions prevent a discussion of the ethnographic data offered by the authors to demonstrate that Whalebone Alley represents an ancient Eskimoan culture. The presentation is excellent, and most of the conclusions are well founded. The interpretation of the monument as a ritual structure, in my opinion, is beyond doubt. I cannot quarrel either with the postulate that the builders of Whalebone Alley possessed a complex social order, or that there are links between Old Bering Sea and Southwest Alaska cultures. I find difficulty, however, in accepting the interpretation that Whalebone Alley was used by a secret whalers' society. The authors base this last interpretation on Lantis's (1938, 1966) reconstruction of whale ceremonialism in Alaska and on the Northwest Coast. Excellent as it is, there are points open to challenge, and it is precisely these points on which the authors rely in their interpretation. Specifically, the strongest evidence links the Bering Strait area to the Aleutians, but Lantis's hypothesis of the existence of whaling societies among the Aleuts is the weakest point in her presentation. My own research indicates that whaling in the Aleutians was recent and had very restricted distribution — much more limited than postulated even by Heizer (1938, 1943a, b). The existence of secret whaling societies among the Aleuts I consider very unlikely, though they may have existed among the Koniag. The emergence of the Koniag as a political entity, the appearance of the Koniag culture in southwest Alaska, and the patterns of interaction between the Aleuts, the Koniag and Indians of the Northwest Coast are far from clear, and the temporal framework for such patterns has not been developed. In short, before one ascribes Whalebone Alley to an elite of whalehunters who constituted a secret ritual society, further investigation is needed of the spread of whaling and of rituals and social-grouping formation associated exclusively with whaling, not only in Alaska but elsewhere. No doubt, in any such future investigation Whalebone Alley will play a major role.

The book is a must for archaeologists and ethnographers concerned with Eskimoan and Alaskan cultural history and development. Translation of the book into English at the earliest possible date is urged.

REFERENCES

BLACK, L.T. In press. Aleut Art. Anchorage: Aleutian/Pribilof Islands Association Inc.

HEIZER, R.F. 1938. Aconite arrow poison in the Old and New World. Journal of the Washington Academy of Sciences 28(2):358-364.

———. 1943a. Aconite Poison Whaling in Asia and America: An Aleutian Transfer to the New World. Smithsonian Institution Bureau of American Ethnology Bulletin 133. Washington, D.C.: U.S. Government Printing Office.

———. 1943b. A Pacific Eskimo invention in whale hunting in historic times. American Anthropologist 45(1):120-122.

LANTIS, M. 1938. The Alaskan whale cult and its affinities. American Anthropologist 40(3):438-464.

———. 1966. Alaskan Eskimo Ceremonialism. (Originally published 1947.) Monographs of the American Ethnological Society No. 11.

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A CENTURY OF CANADA'S ARCTIC ISLANDS. Edited by MORRIS ZASLOW. Ottawa: The Royal Society of Canada, 1981. Proceedings of the 23rd Symposium. 358 p. CAN $20.00 soft cover; $25.00 hardcover.

The centenary in 1980 of the transfer of the Arctic Islands from British to Canadian sovereignty provided the occasion to take stock of developments in the most northern, and for long the most neglected, part of Canada. The bold decision by the Royal Society of Canada to hold a symposium in Yellowknife, Northwest Territories, was amply justified by an attendance of about 180 participants and good media coverage, made possible by excellent local support through the courtesy of Commissioner John Parker and the Government of the Northwest Territories.

For many years, because of the vast size and sparse population of the country, there was a general attitude among Canadians that since the frontier and bush are close anyway, why bother about the far north? Changes in this attitude emerged only if sovereignty seemed to be threatened, or when exploitable minerals were found. Minerals were not found in commercial quantity in the Arctic Islands until oil and gas exploration started in the 1960s, but at the beginning of this century fears of possible American or Norwegian claims to sovereignty, based on right of discovery, led to the establishment of the Eastern Arctic Patrol. Apart from this and apart from the establishment of Royal Canadian Mounted Police stations on Devon Island and Ellesmere Island, there was — with one notable exception — no Canadian Government activity in the Arctic Islands until World War II, when the advent of aircraft and American involvement in the Arctic forced a change in policy. The exception was the Canadian Arctic Expedition of 1913-18, led by Vilhjalmur Stefansson who, largely on his own initiative, made important discoveries in the northwestern Arctic Islands. There were of course a number of foreign expeditions that penetrated the area in the period 1880-1945, and whaling continued in the Beaufort Sea and Davis Strait up to 1915. But after World War II the establishment of the Canadian-United States Joint Arctic Weather Stations provided jumping-off points for geological (and other) investigations, which in turn led to the recognition of the oil and gas potential of the Arctic Islands and a quickening of government interest in the area. Government policy was also influenced by strategic considerations.

Such, in brief, is the background ably described in three papers on geographical exploration (William C. Wonders, Hugh N. Wallace and Alan Cooke), and in papers on whaling (W. Gillies Ross), administration (the Editor himself), jurisdiction (Donat M. Pharand), shipping (T.C. Pullen), aviation (co-authors K.R. Greenaway and Moira Dunbar) and defence (Richard J. Diubaldo). The remaining sixteen papers deal with scientific research (Svenn Orvig on meterology; M.J. Dunbar on oceanography; E.R. Pounder on ice and snow; S.D. MacDonald on terrestrial biology; co-authors R.L. Christie and J.Wm. Kerr on geology; Peter Schledermann on archaeology), mineral exploitation (co-authors D.C. Findlay, R.I. Thorpe and D.F. Sangster on non-hydrocarbon minerals; Gordon H. Jones on oil and gas), environmental concerns (Robert Page), new styles in administration (F.A.E. Cserepy), Canada and the circumpolar world (Trevor Lloyd), and broadly the people of the north and their culture (Milton M.R. Freeman, Minnie Aodla Freeman, Peter Ittinuar, Graham W. Rowley, Thomas H.B. Symons). The Editor remarks in the Preface that "contributions . . . varied in many ways, and the result was unevenness of styles and treatment, gaps and repetitions." And he might have added unevenness of quality. Fortunately his skill has largely overcome these problems, if a blind eye is turned on one or two offerings.

The scientific research papers provide useful summaries of past field work and of knowledge acquired, but some fall short in identifying the main problems to be resolved and in charting the course of future work. On the other hand, the papers on technology and mineral exploitation are more forward-looking, and reflect a confidence that the conflict between economic and environmental interests, and the interests of the native people, can be overcome — a confidence that may or may not be justified in the crucial decade of the 1980s. In both lots of papers some authors list numerous primary reference sources, but other authors, presumably uncertain of their readership, rely mainly on secondary sources or have omitted references altogether. It is of course only too easy to pick on omissions and deficiencies in review papers, but two more may be worthy of notice. In geological research there is no reference to the seminal paper by Y.O. Fortier and L.W. Morley (1956) on "Geological Unity of the Arctic Islands" (*Transactions of the Royal Society of Canada* L(III):312) and in ice research, where surging glaciers are worth a paragraph (p. 166), there is no mention of the glacier at the head of Otto Fiord, Ellesmere Island, the only glacier in the Canadian Arctic known to have surged (*Nature* 20(4915), 1964:176).