

ICE BLINK: NAVIGATING NORTHERN ENVIRONMENTAL HISTORY Edited by Stephen Böcking and Brad Martin

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The Experimental State of Nature: Science and the Canadian Reindeer Project in the Interwar North

Andrew Stuhl

Like a black mass of some fluid the herd slowly approached the edge of the plateau—began to flow down first slowly—a few deer at a time but soon gathering impetus and speed and ending in a wild rush. ... It was a grand sight that I will never forget. ... The drive is on its way to Canada.

—Alf Erling Porsild, 1929¹

In 1929, on the tattered pages of a field journal, botanist Alf Erling Porsild recorded a “grand sight.” Before his eyes, a herd of nearly three thousand reindeer set off for northern Canada from the Seward Peninsula in Alaska. The scientist had good reason to commemorate this moment: it marked his success in transforming the Arctic into reindeer country.

The Canadian Department of Interior initiated the Canadian Reindeer Project in 1926 with hopes of bringing industry and civilization to the nation’s northernmost frontier. Reindeer, a species foreign to North America but common in other parts of the circumpolar world, seemed

perfectly adapted to both the physical environments of the region and the state's priorities. Through the consumption of tundra plants, these domesticated animals could create readily accessible meat, hides, and bones. These items were critical to Inuit livelihoods, but had become scarce as caribou populations dropped over the turn of the twentieth century. More than a "natural" form of social support or a possible commercial good for export, reindeer were a tool of northern colonization. State officials hoped herding units would organize dispersed and semi-nomadic Inuit hunters and thus facilitate regulation of people and land uses in the Arctic.²

Between 1926 and 1944, Porsild laboured tirelessly to make these colonial dreams come true. The Canadian government employed him to investigate existing reindeer industries in Alaska and determine the conditions underpinning their success. This investigation was a precursor to another, in which he surveyed thousands of square miles of the north to identify a suitable home for a Canadian herd. His official report of these travels provided the basis for the government's choice of the Mackenzie Delta as a home for its "experiment."³ Pulling double duty as a colonial official, Porsild oversaw the construction of a new town on the Mackenzie River to house the reindeer—Reindeer Station—and ventured to Norway to find Saami herders to instruct Inuit apprentices. Working together with other researchers and civil servants in Ottawa, Porsild erected a regulatory apparatus to supervise people, animals, and the land in the Arctic.⁴ For the scientist, the view of the herd entering Canada for the first time in 1929 was indeed a vision. Reindeer ushered in a new era in the north.

In this essay, I position the arrival of reindeer in Canada as a watershed in northern history. Attention to the practice of science in the Reindeer Project reveals shifts in relations between the Canadian state and the Arctic, as well as in human relationships with nature in the region itself. Before reindeer, the Canadian government had mobilized scientific knowledge about the north as a means of enumerating the resources of these remote territories.⁵ With the employment of Porsild, however, the state mobilized science not to document entire landscapes or bring samples of them back to museums, but to reduce complex human and physical environments to a few key variables. State agencies could then manipulate these variables to serve particular political and economic ends, like developing markets for meat in urban centres or demarcating public domain in the far north. Reindeer projects, then, were experimentalist both in the

sense of the scientific method and insofar as the Canadian government had never before managed arctic resources directly.

As they did for Porsild, reindeer may afford Canadian historians new perspectives on the north. For the purposes of this essay, my focus is on the decades between the two world wars. The interwar era has received less scholarly attention than the more iconic northern episodes that precede and follow it, like the Klondike Gold Rush or the infrastructure megaprojects implemented after Second World War. Some scholars have characterized Ottawa in the 1920s and 1930s as neglectful of northern territories, citing an isolationist and reactive posture to issues of sovereignty and welfare. But recent analyses by environmental historians have demonstrated that, in other arenas, the government was more involved and exacting. By focusing on nature in northern history—the restriction of Aboriginal hunting, the establishment of northern parks, and the expansion of fisheries and mineral industries—these historians have revealed how central the remote north was to national politics and world economies. The control of northern natural resources became a vehicle for extending federal jurisdiction over northern peoples and linking marginal environments to global markets. By reshaping the north, Canada redefined its dominion at home and abroad.⁶

A close look at reindeer in this essay builds on these interpretations of northern history by incorporating the central role of science in mediating human relationships with the natural world. As detailed in the first section of this chapter, the physical and human landscapes above the Arctic Circle presented the Department of Interior with challenges not found in other northern areas. Copper deposits had been identified near the lower reaches of the Coppermine River, but there were minimal food resources available locally to sustain a labour pool. Moreover, Inuit occupied the arctic coastline across the northern edge of western Canada, and were reluctant to sign over rights to their land through treaty arrangements. Government officials looked to scientists, including Porsild, when crafting solutions to these problems.

As Porsild conducted field research and instituted a plan for herding, his science fundamentally changed the Canadian state and the arctic environment. As we will see in the second half of this essay, managing animal husbandry economies required institutional arrangements and approaches not found in the development of the Canadian north elsewhere.

As scholars in this volume convincingly show, a multi-national mining industry and the machinery of expertise associated with it were crucial to the exploitation of many regions north of sixty from the late 1800s through the 1940s.⁷ Private mineral companies, alongside governmental engineers, geologists, and surveyors, rendered distant northern lands knowable and therefore more easily subject to corporate and federal power. Government agents quickly realized, however, that these institutions and forms of knowledge were not suitable for a development regime based on reindeer. In learning how to manage a foreign species, the Canadian government reimaged criteria for scientific authority, forged novel partnerships with the United States, collected unprecedented scientific data about the tundra, and generated new instruments for regulating northern land uses. In the conclusion, I suggest these results of the reindeer experiment comprise part of the continuing legacy of the interwar north, even as governments and corporations jettisoned herding programs in the second half of the twentieth century.

Taming the Arctic: The Impulses behind the Canadian Reindeer Project

Experience has proven that there are periodical fluctuations in the number of fur-bearing animals and that caribou cannot be depended upon to follow the same migration routes each year. With the object of broadening the basis of subsistence of the natives, especially in view of the rapid advance of mining in the Northwest Territories, the Department of the Interior has for a considerable time been looking into the possibilities of increasing the numbers of the larger ruminants.

—*Canada's Reindeer Experiment*, 1936⁸

Reindeer first came to North America in the late 1800s under the direction of missionaries. These men hoped to alleviate starvation among Native northerners in Alaska whose subsistence base of caribou and marine mammals had been destroyed by commercial fisheries industries.⁹ Missionaries believed the reindeer could turn non-arable hinterlands into

productive grazing lands and so-called primitive Inuit hunters into sophisticated herders.¹⁰ Sheldon Jackson brought a herd across the Bering Strait from Siberia to Port Clarence, Alaska, in 1892. In Canada, Dr. Wilfred Grenfell spearheaded the introduction of reindeer to Newfoundland in 1908 with motivations that mirrored Jackson's.¹¹

These initial introductions had differing fates. Jackson's Alaskan herd swelled in the early 1900s. Smaller herds were spun off the main group and driven to Inuit settlements along the Bering Strait and Beaufort Sea coasts. Congress grew interested in the possibility of pairing the civilizing mission behind missionary-led herding with education, and dispatched US Bureau of Education staff and Saami herders from Scandinavia to each village to teach the would-be Inuit herders. Meanwhile, countless obstacles plagued the Canadian herds. Predacious wolves, pestering flies, straying animals, and poor grazing lands were all problems reindeer officials could not solve. In addition, as the federal bureaucracy expanded to incorporate new departments for the north and for wildlife in the late 1910s, Ottawa bureaucrats disappointed in reindeer shuffled the responsibility for herding programs. After many of the animals died, the Parks Branch took over those that remained, only to transfer them to the Anticosti Island Administration in 1923. This herd remained small and isolated compared to what became of the Canadian Reindeer Project in the 1930s and 1940s.¹²

After 1918, Canadian government officials gained new motivation and partners to develop reindeer industries. Reindeer garnered attention following the completion of a series of scientific expeditions to the western Arctic in 1918. Inspired by their travels in the north, expedition members championed reindeer as a vehicle of economic development and game management. Like missionaries before them, biologists, geographers, geologists, and anthropologists leaned on their own experience to deploy a complicated rhetoric about protection and exploitation. Along with federal officials, northern police, and whaling captains, scientists imagined the north as meat-producing factory and game sanctuary. There, domesticated musk ox and reindeer met the needs of Canadians through the commodification of northern prairies and the conservation of large native mammals.¹³

These attempts by expedition scientists to redefine the Arctic through reindeer mediated post-First World War concerns about food scarcity and industrialization in North America. As western ranches gave way to

settlement, European agricultural fields recovered from the wounds of battle, and urban populations exploded, the Canadian north appeared as both a promising frontier for livestock and a landscape on the verge of repeating the west's environmental history. Historian John Sandlos has argued the discursive practices relating to conservation in the north created an "Arctic Pastoral," in which bureaucrats, sportsmen, scientists, and other conservationists portrayed the Native hunter as "irrational and destructive" and the arctic tundra as an environment ripe for government-sponsored development. In combination with other measures, such as regulating hunting and creating national parks, taming the musk ox and introducing reindeer sought to stem the supposed "wanton slaughter" of certain game species, like caribou. In so doing, bureaucrats in Ottawa sought to establish northern lands and animals as national resources and southern bureaucrats as the logical managers of these assets.¹⁴

As we attend to the elaboration of the Canadian Reindeer Project in the 1920s and 1930s, it is important to distinguish between two kinds of northern nature at stake in the Arctic Pastoral: wildlife and tame-life. Administrators articulated the impulses behind reindeer herding as distinct from—though related to—the conservation of game. These impulses responded in part to the particular challenges of engaging Inuit and the arctic environment in the project of development.

The distinctions between wild and tame can be brought into focus by attending to the legal relationship between governmental agents and Inuit in the early twentieth century. The federal government was unable to secure a treaty with Inuit (as they had with Dene living along the Mackenzie River), as the Inuit did not sign Treaty 11, the comprehensive agreement of 1921. According to one Inuit scholar, "Our people had the necessary tools for surviving and there was enough game around to meet their needs, so they didn't see the need to sign any treaty."¹⁵ While the Royal Canadian Mounted Police and missionaries had enforced legal and moral codes at whaling and fur-trading outposts in Inuit territory, the formal designation of Inuit as wards of the state did not occur until the Indian Act was amended in 1924.¹⁶ Still, Inuit had never agreed to the terms of this amendment nor dissolved any rights to the land, and thus federal agents must have been eager to find some additional apparatus to bring Inuit under the purview of national law. Indeed, in the contemporary case of musk ox conservation, consultants to the Advisory Board on Wildlife

Protection suggested the federal government practice diplomacy with Inuit to enlist northerners in the project of protecting nature. This seemed a more effective alternative to doubling-down on hunting regulations that could not be adequately enforced.¹⁷

Accounts from Inuvialuit residents suggest that reindeer were living forms of bureaucracy in the Canadian Arctic. According to Randall Pokiak, Inuit living in the Mackenzie Delta and along the arctic coast in the early 1900s were troubled by the recent influx of Alaskan Inupiat into the area, as they deemed these foreign Natives responsible for the recent decline in caribou populations. Alaskan Inupiat had travelled eastward since the 1880s, first with commercial whalers who had over-harvested caribou in the Bering Strait and north slope regions, and later to avoid an epidemic of Spanish Influenza after 1918. Calling on a local shaman, Inuvialuit leaders hoped to alter the migration patterns of caribou to force the Inupiat to return to Alaska. The caribou did go away, but did not return, and the Inuvialuit thus became amenable to new means of procuring food. When government agents approached the Inuvialuit in the 1920s, Aboriginal leaders negotiated for the delivery of reindeer from Alaska, having “heard stories from the Inupiat that reindeer had the same diet as caribou.”¹⁸ Oral histories indicate that one Inuvialuit man, Mangilaluk, negotiated with the government on behalf of local communities, suggesting to treaty officers that, “if they brought reindeer from Alaska to Tuk area they would think about signing an agreement.”¹⁹ In Canada, then, reindeer created possibilities for making Inuit into colonial subjects, whether through religion, commerce, or law.

The control of nature also played out differently in introducing tame-life than it did with conserving wildlife. On the ground, corrals brought widely dispersed animals and herders to one geographic location at two distinct points in the year, allowing for counting, branding, slaughter, and evaluation. On a broader scale, legislation in Ottawa also enclosed people and resources in the Arctic. The creation of a six-thousand-acre Reindeer Grazing Preserve in the Mackenzie Delta and a federal protection ordinance for reindeer made northern nature a federal responsibility. In the context of an introduced reindeer industry, protected areas would have to be administered according to the demands of recruiting Inuit to herding animals. This was quite different than preventing the hunting of wild species. In a 1935 meeting of the Interdepartmental Reindeer Committee,

a body organized in 1932 to help guide the Project's evolution, biologist Rudolph Anderson and anthropologist Diamond Jenness contrasted the functions of national parks with those of the Reindeer Grazing Preserve. The scientists agreed that the national parks were designed to protect all wildlife in perpetuity. But in the preserve, hunting and trapping must be carried out by herders, as they required a certain amount of fur for winter clothing. The scientists noted it would be nearly impossible to attract Natives to herding if trapping privileges were denied. In making this distinction, Jenness and Anderson helped construe the Reindeer Preserve as an experimental space for managing Inuit and nature. With aims to domesticate, study, and develop, reindeer projects were more like colonial botanical gardens than hunting preserves.²⁰

Most importantly, reindeer herding became a key mechanism in plans for arctic economic development in ways that wildlife and national parks did not. Reconnaissance work in the Coronation Gulf during the Canadian Arctic Expedition of 1913–18 returned with the promise of extensive copper deposits. Scientists argued that, in order to capitalize upon these resources, a local food source would need to be established, since populations of migrating caribou had been decimated. Many southern Canadians also believed that white men were unlikely to want to live in the north and might be physically unable to do so. Reindeer and Inuit offered solutions to these problems. Inuit could be responsible for maintaining reindeer herds, the meat from which could be shipped to the Coronation Gulf, reducing overhead costs for privately or federally sponsored mineral extraction. Drawing connections between labour needs, environmental changes, and the possibilities of reindeer and mineral economies, promoters of northern development often articulated Inuit as the Arctic's most valuable asset. Without them, the government would "spend millions" to get people to live and work there. Jenness, who had recently returned from three years of study among the Copper Inuit of the Coronation Gulf, distilled the situation for his audience at a 1923 lecture at the Victoria Memorial Museum. "Unless we use the Eskimos," he argued, "we can never develop the Northland."²¹

As Canadian scientists and bureaucrats began to see the value of reindeer for arctic development, they were forced to think differently about the existing northern fur trade. Especially after the stock market crash in 1929, the discourse around reindeer in North America asserted the

value of stability found in husbandry economies while denouncing the volatility of dealing in fur and its associated markets. Herding and harvesting reindeer appeared to state agents as more stable than the fluctuations inherent in animal populations and the fur trade, which was rapidly expanding across the Beaufort Sea coast after the Great War. Regulating hunting of native species would not necessarily address the unpredictability of markets and nature, but building up reindeer as a subsistence base might. Such a “native-run industry,” the kind government agents advocated for in the early 1930s, gradually replaced the visions of a grand northern meat industry.²²

Rhetoric about reindeer reflected the complicated project of administering the Arctic during the interwar period. Emerging from missionary-sponsored civilizing missions, reindeer projects found new impulses after 1918. Industrial boosterism, the limits of legal relationships with Inuit, concerns about the volatility of wild nature and markets, and desires to build a northern mineral industry all infused the conversation on herding programs. After the Great War, many Canadians believed that taming the Arctic was the key to the region’s future. Over the 1920s, a series of trials and errors would test this optimism and catalyze new relationships between science and the federal government.

Exploratory Engineer or Botanist? Testing Definitions of Arctic Expertise

It was not clear what kind of expert would lead the Canadian Reindeer Project. In the winter of 1919–20, members of a royal commission on musk ox and reindeer sat down to a series of meetings in Ottawa. This body was brought together by explorer-anthropologist Vilhjalmur Stefansson to “investigate the possibilities of the reindeer and musk-ox industries in the Arctic and Sub-arctic regions of Canada.”²³ The Commission called thirty-five witnesses to testify on the opportunities and obstacles facing a reindeer industry. That no trained botanist had spent enough time in reindeer country to give evidence before the Commission did not appear to be an issue, though it became one in 1926.

The Commission heard from whalers, missionaries, northern police, elected officials, explorers, and self-identified scientists.²⁴ Despite their

divergent training, all had spent considerable time living or traveling in the north. Importantly, eight had recently returned from the Canadian Arctic Expedition of 1913–18.²⁵ Commission members queried witnesses on issues suspected to be indicators of failure or success of reindeer introductions, including “vegetation, soil, climate, topography, and surface conditions.”²⁶ Testimony detailed the extent and distribution of vegetation in certain geographical districts; the presence or former presence of caribou, which was assumed to denote the potential for reindeer; and the existence of mosquitoes and prevailing winds (to account for a troublesome reindeer pest, the mosquito).²⁷ Excitement for the reindeer industry grew with each meeting. The Commission outlined vast swaths of the north as Canadian reindeer country, including several islands in Hudson Bay, the entire Ungava and Mackenzie Districts, the interior of the Yukon, and the arctic coast from the international boundary to Kent Peninsula. Given northern Canada’s similarities with Alaska, Siberia, and northern Europe—all areas with thriving reindeer industries—witnesses believed animal husbandry would finally capitalize upon “vast tracts of country that are not utilized.”²⁸

Yet there were also many concerns with existing knowledge about northern lands. Commissioners admitted that there was much “conflicting evidence” about whether Inuit would take to herding, how reindeer managed pests, and how much time plants needed to recover after grazing. Commissioners underlined the importance of continued governmental presence “to remove the elements of doubt and uncertainty, and so tend to encourage private enterprise and investment.” This could be accomplished through “careful study,” of individual localities, so as to “utilize to the best possible advantage, as means of control, any suitable valleys or other special topographical features, which may be available.” Participants agreed that the Canadian government should lead the initial reindeer trials, beginning with a small, manageable herd, working out any kinks in logistics, and paving the way for future investment by private groups.²⁹

Despite this faith in government-led development, the first attempt to cash in on reindeer following the Royal Commission came from the north’s biggest corporation and biggest personality. Resigning from the body, Vilhjalmur Stefansson introduced reindeer to Baffin Island in 1921, in conjunction with a new subsidiary of the Hudson’s Bay Company, the Hudson’s Bay Reindeer Company. This project was a public disaster,

as the \$200,000 spent to transport six hundred reindeer and six Saami herders from Norway was squandered in six years. In 1921, the herd was delivered to Baffin Island, and, by 1927, most of the reindeer had died or disappeared, prompting the government to cancel the Company's grazing permit.³⁰ Reports of this debacle—and the controversy they inspired—eventually catalyzed the hiring of botanist Alf Erling Porsild and major changes in relations between science and the state.

The Hudson's Bay Company hired Alaskan reindeer specialist W. T. Lopp in 1925 to assess the problems with Baffin Island and to survey the island for potential areas for continued experimentation. Lopp's report concluded that the Company herd failed because of the choice of location, calling the plot "virtually worthless as range for reindeer." Lopp's insistence on this root problem seemed to call the whole enterprise into question. While the Company could buy more animals, replace its manager, Storker Storkerson, or invite more Saami families to assist them, Lopp wrote that the tundra itself—the "handicap" of its operations—could be neither "remedied nor removed." His surveys of the remainder of Baffin Island showed little hope for future industries there.³¹

Newspapers across the United States and Canada covered Lopp's report, sparking a controversy with Stefansson. Stefansson interpreted the report as inflicting severe damage on his reputation as an expert on northern matters. During one of the anthropologist-explorer's high-profile lectures in Ottawa, Edward Sapir, the director of anthropology at the Geological Survey of Canada, challenged Stefansson on the Baffin Island ordeal, asking for some explanation for the "Reindeer experiment on Baffinland." Stefansson blamed the failure on issues of management, suggesting that the Hudson's Bay Company did not heed his advice and also had mistreated Storkerson. Sensing that he was losing favour with Canadian audiences—whether in that lecture hall, or in broader commercial, intellectual, or political circles—Stefansson sent a private letter to Carl Lomen, the head of the Lomen Reindeer Corporation in Alaska. Lomen's business had boomed since the mid-1910s, with herds dotting much of the Alaskan coastline and markets for reindeer meat popping up across the United States. The explorer-anthropologist admitted to Lomen that Lopp's report might result in the Hudson's Bay Company backing out of the reindeer business, and that Lomen should consider working with Stefansson in

buying up land on Baffin Island. Lomen did not take up the offer, signaling Stefansson's increasingly marginal role in reindeer industries after 1925.³²

Stefansson was known for his contentious nature, but this case was as much about changing requirements for knowledge about the north as about his knack for the spotlight.³³ Before 1921 and the formation of the Hudson's Bay Reindeer Company, members of the Canadian Department of Interior relied on substantial northern experience—like the kind Stefansson had amassed in his ten years in the Arctic, or that embodied by the witnesses to the Royal Commission on Muskox and Reindeer—over pure academic scientific training when appraising the needs of a possible reindeer industry. Those with both academic expertise and northern experience, like many of the scientists invited to the Commission, seemed especially useful sources.³⁴ In early 1926, after Lopp's report was made public, the Department of Interior retained its emphasis on northern experience and academic expertise, but refined its interest in a particular type of knowledge and know-how: applied botany.

These shifting definitions of arctic expert authority materialized in correspondence among Canadian bureaucrats trying to decide on a suitable manager for the Canadian Reindeer Project. In January 1926, before the publication of Lopp's report, the head of the Northwest Territories and Yukon Branch could see little value in a botanist. O. S. Finnie wrote the Deputy Minister of the Interior, making a plea for a man with practical skills to lead a government reindeer project. "I do not think the qualifications as a Botanist is sufficient," he wrote, because "I believe we would get better results if we could get a practical reindeer man who knows the kind of feed that the reindeer live on, and one who is a good traveller and could go through the country and size up the situation accurately and quickly."³⁵ Finnie wanted to hire Lopp, but the Alaskan was unavailable due to his contract with the Hudson's Bay Company. In addition, the stress placed on the ability to travel raised concerns about his age—Lopp was nearly seventy years old.³⁶

By 1927, though, Finnie expressed a firm commitment to applied botanical science as a way of knowing and managing reindeer. When a second private venture, the Dominion Reindeer Company of Vancouver, inquired in 1927 about leasing land in the Northwest Territories, Finnie responded with caution. He was unable to recommend any location "until the different districts in the North West Territories had been thoroughly

cruised with a view to determining their value as feeding grounds for the reindeer.” Finnie admitted to the director of the National Herbarium, M. O. Malte, that his hesitance with the Dominion Reindeer Company emerged from the Baffin Island incident. A lease was granted to the Dominion Reindeer Company in the eastern Arctic in 1928, contingent on a scientific survey of the region. This survey was never completed, the Dominion Reindeer Company never introduced reindeer, and the government terminated the lease in 1931. As Finnie noted, the recent history with commercial enterprise had “served as a lesson” for governmental managers of reindeer experiments.³⁷

What happened in the interim to change Finnie’s mind? Beyond the report issued by Lopp, Finnie and other reindeer enthusiasts in Canada were convinced of the value of applied botanical science by their counterparts in Alaska. In March of 1926, two months after Finnie voiced skepticism about botanists, high-ranking Canadian official W. W. Cory visited New York City and Washington, DC to consult with US officials on best practices for a Canadian reindeer industry. While in the American capital, Cory met with Dr. E. W. Nelson, the chief of the United States Bureau of Biological Survey, an agency that assisted both the Lomen Corporation and the US Bureau of Education with reindeer operations in Alaska. In 1920, Nelson had dispatched two scientists to Fairbanks, Alaska, where they began surveys and experiments on reindeer, including their principal movements, feeding habits, and major predators, pests, and diseases. Nelson impressed upon Cory that a single man could not handle the duties of getting the Canadian Reindeer Project off the ground. They also required surveying Canada for suitable forage and building the systems of reindeer management, like the supervisory hierarchies, corrals, and storage facilities needed to round up, slaughter, and process reindeer.

Moreover, Nelson advocated for trained ecologists to fill these roles, as the Bureau’s grazing scientist, Lawrence Palmer, had made clear the importance of scientific studies of reindeer feed. Nelson attributed the steady growth of reindeer populations in Alaska to Palmer’s ability to translate his studies to the management of grazing lands. In 1901, one thousand animals roamed the coasts of Alaska; by the mid-1920s, that number had exploded to over two hundred thousand. Palmer had also argued that, when his research was fully applied, reindeer country in Alaska could support three million livestock. Nelson suggested that the Department

of Interior hire two botanists and have them apprentice with Palmer for six months, learning the particulars of reindeer ecology and the reindeer business. Cory relayed this news to Finnie, and with both men sold on the model of the Alaskan industry, they began to see botanical expertise, both academic and applied, as fundamental to reindeer management.³⁸

These conversations among Stefansson, Lopp, Finnie, Malte, Cory, and Nelson redefined the terms of state power and science in the Arctic. Scholars have described relationships among the Canadian state and explorers during the interwar era as tumultuous, especially as the north became a site of economic and political development and as bureaucrats endured debates provoked by Vilhjalmur Stefansson.³⁹ In the case of reindeer and the Arctic, fields of expertise were similarly unstable. Since the Canadian government was experimenting with taming the Arctic for the first time, it needed new experimenters. Naturalists, explorers, geographers, geologists, topographers, biologists, and anthropologists had been instrumental in documenting and discovering the north before the Great War. But none of these specialists appeared as “qualified men” for the duties necessary in starting a government herd.⁴⁰

In 1925, Finnie and Cory referred to the person capable of guiding the Project as an “Exploratory Engineer.” But by May 1926, Finnie had hired both a “Botanist” and an “Assistant Botanist.” These titles captured the shifting position of science relative to the state, as well as the place of the north in Canada during the interwar period. The jobs required an expert traveller who could make use of the north’s existing transportation networks and yet “size up the situation” from the dogsled when necessary. He was a botanizer, who systemically collected data about vegetation patterns from landscapes in Alaska, Yukon, the Northwest Territories, and the Keewatin District. Finally, he was a project manager, who could apply extensive and intensive studies in selecting appropriate pastures and best management practices, the foundations of a new industry in the north.⁴¹

Finding the Men for the Job: Alf Erling Porsild, Robert Porsild, and a Transnational Reindeer Network

With the help of Dr. Malte of the National Herbarium, Finnie prepared a memo soliciting Canadian universities and governmental departments for trained botanists. This memo stated clear requirements for knowledge of systematic botany, with specific competence in the flora of the Canadian north. They wanted candidates who could work independently in a harsh, remote, and difficult terrain. They had to have common sense and a proven ability to apply knowledge to economic benefit. Yet queries to schools in Ontario, Alberta, Saskatchewan, and Quebec failed to turn up a single nomination. No government men applied for the job, either. But by a stroke of luck, Malte knew of two Danish brothers who fit the Department of Interior's bill.⁴²

Malte had recently been contacted by Morten Porsild, the director of the Arctic's first biological station at Disko Island (Greenland). Morten's sons, Alf Erling and Robert Porsild, grew up in the shadow of the station, within a transient community that offered useful training in northern botany and arctic travel. The two men spent their youth building elaborate plant collections, competing with one another to win their father's approval. They met government officials and arctic scientists from around the world and cut their teeth on dog sledding while accompanying research parties. When Morten Porsild contacted Malte to inquire about employment possibilities for his sons, Malte was ecstatic to learn of trained botanists with arctic experience—even though the men knew little about reindeer.⁴³

The decision to hire the Porsild brothers again made use of the United States Bureau of Biological Survey's director, E. W. Nelson. W. W. Cory first contacted Alf Erling and Robert Porsild, meeting the two brothers while they visited Chicago. Cory was impressed by Alf Erling's knowledge of Inuit culture and language and of northern vegetation. In April 1926, Finnie, Cory, and Alf Erling Porsild went to Washington to meet with Nelson. Here, Nelson facilitated what would become the brothers' indoctrination to reindeer: a half-year spent visiting the Alaskan operations and studying the work of Bureau of Biological Survey biologist Lawrence Palmer. Finnie wrote the brothers in May 1926, detailing the orders to be completed.⁴⁴

The Porsilds' recruitment makes visible a network that bureaucrats used to manage the Canadian Reindeer Project in the 1920s and 1930s. We have briefly visited several nodes in this network: Disko Island; the Bureau of Biological Survey's headquarters in Washington, DC; and, in Ottawa, the Royal Commission's hearings and Finnie's reindeer team. As we will see, between 1926 and 1936 this network expanded to include Fairbanks, Alaska; Kautekeino, Norway, where Porsild hired Saami herders hired to train Inuit apprentices; the Norlite Building in Ottawa, where the Interdepartmental Reindeer Committee met to discuss the Project's progress; and the Mackenzie Delta, the eventual home for Canadian reindeer. This network comprised the intellectual, political, and physical space of the Project, and continued attention to it helps us to comprehend further the relationship between science and the state in the interwar north. At these sites, and via the knowledge produced therein, the Canadian government was able to design and implement the Project and direct the day-to-day operations of Saami herders, Inuit apprentices, and imported reindeer in the Arctic. This network was also responsible for realizing the long-imagined dream of northern reindeer herds in the persons of arctic vegetation specialists Robert and Alf Erling Porsild.

Their abilities to speak an Inuit language and travel in harsh northern conditions, combined with their studies at a pioneering institution for arctic science, met the expectations of both the Canadian Department of Interior and the US Bureau of Biological Survey.⁴⁵ While Finnie had been initially resistant to the value of a botanist, other northern promoters bristled against the shifting domains of credibility surrounding reindeer. The Porsild brothers' lack of practical experience with reindeer was not lost on Vilhjalmur Stefansson, who lobbied his peers to reconsider their hiring.⁴⁶ However, these deficiencies did not bother Finnie, Cory, and Nelson, who came to believe in the Porsilds' talents and skills, and were convinced that time spent in Alaska gaining hands-on experience with reindeer and grazing science would fill in any remaining gaps. While his brother Robert eventually left the reindeer business, Canadian bureaucrats and scientists soon identified Alf Erling Porsild as a leading authority on arctic vegetation and reindeer.⁴⁷

A Regime for Reindeer: Lawrence Palmer, Lichens, and Legibility in Reindeer Country

In May 1926, the Porsilds headed for Fairbanks, where they began their studies with Lawrence Palmer. They carried a note from the director of the US Bureau of Biological Survey that served as instructions for the Alaskan ecologist. Palmer was to offer the Porsilds his “fund of information” on reindeer.⁴⁸ This fund had been generated by his quadrat studies on tundra re-growth and carrying capacity at the Fairbanks experimental station, and his collaboration with the US Bureau of Animal Industry on the nutritive quality of various types of forage.⁴⁹ E. W. Nelson also recommended that the Porsild brothers be introduced to the practical workings of the herds, trying their hands at corralling, capturing, marking, castrating, and branding.

Discerning the Porsilds’ apprenticeship with Palmer is crucial to our understanding of the Canadian Reindeer Project and how it unfolded in the remainder of the twentieth century. This partnership guided the Porsilds in siting the Project and crafting its inner workings. Palmer emphasized the importance of a particular kind of knowledge in first selecting and subsequently managing a reindeer grazing area. The Porsild brothers, Nelson wrote, “should be taught as much as possible concerning the forage plants used by these animals, with a special view to the differences between the summer and winter forage and the need of safeguarding the winter forage areas from use in summer in order that the range may be perpetuated. ...”⁵⁰ Recognizing and protecting forage were foundational to managerial decisions in the Canadian Reindeer Project. As such, these twinned convictions were inscribed onto the physical landscape of the Mackenzie Delta and the social interactions of developers, Saami, Inuit, and governmental supervisors.

To understand how this could be so, we must first gather the details of what the Porsilds learned in Alaska, and thus become familiar with the work of Lawrence Palmer. Palmer had studied forestry and botany at the University of Nebraska between 1911 and 1915 before becoming a grazing assistant with the US Forest Service. Hired in 1919 as an assistant biologist at the Bureau of Biological Survey, Palmer considered himself a botanist, biologist, ecologist, and range manager—suggestive of the kinds of relations between plant studies, agricultural development, and state power in

place at the time.⁵¹ He applied his knowledge of grazing relationships in the American west to the study of reindeer. His first five years in Alaska were taken up with reconnaissance surveys of the herds along Alaska's meandering coastline. These surveys supplied Palmer with a sense of the reindeer industry in Alaska, and the seasonal movements of people and animals across the land. As with range management in the west, Palmer concluded that the bases of the industry were the major species of plants that provided nutrition for reindeer. He arrived at this conclusion after careful study of these plants in the field and at the experimental station in Fairbanks.

Nelson's instructions to impress upon the Porsilds the significance of winter forage likely did not surprise Palmer. After all, it was the Fairbanks biologist who had first articulated the significance of this component of the reindeer industry. Palmer developed an elaborate system of experimental pastures and quadrat studies in Fairbanks. These he explored in several lines of research, including the conditions governing forage and range management, the various relations of lichens to grazing, the relative carrying capacity of lichen and non-lichen ranges, and the methods of feeding and their effects.⁵² Palmer parcelled out eleven pastures, each with slightly different vegetation based on its position on the slope of the hill on which the farm sat. He brought reindeer to graze within these pastures, learning about how the animals ate, what plants they selected in different seasons, how they dealt with snow, and how the plants responded in spring. He established quadrats within these different pastures and performed his own tests, cutting plants and picking them by hand. These experiments convinced Palmer that winter forage, comprised mostly of the genus *Cladonia*, was essential to a modern, successful reindeer industry.⁵³ Beyond supplying the local industry with valuable data, Palmer was certain that the study of lichens would also open an entire field of inquiry for the Alaskan and broader scientific communities.⁵⁴

By 1926, Palmer had made a case for organizing the entire industry around *Cladonia*. He noticed that winter ranges were patchier than summer ranges, and so winter resources had to be protected—especially given the observation that reindeer bunched up in colder temperatures, potentially overgrazing their food source. A closer look at the nutritive quality of winter forage plants and their reaction in quadrat studies to mowing, picking, and feeding showed surprising results.⁵⁵ Even after only

a few years of observation, Palmer noticed that it might take winter lichen ranges ten to fifteen years to “come back to a normal height growth of four to five inches,” and thus “proper management of the winter range presents an exceptionally important problem.”⁵⁶ Palmer had initially estimated that each reindeer required thirty acres of land per year. But this number was based on the supposition that tundra could recover from grazing within five to ten years. After allotting time for recovery, especially the winter range, he asserted that carrying capacity must be on the order of forty to sixty acres per head. Extrapolating to the available land in Alaska suitable for grazing, he estimated that the territory could support three million reindeer, three times as many as the fully stocked industry had in 1926.⁵⁷

Palmer’s conclusions about *Cladonia* and carrying capacity fit into the Bureau of Biological Survey’s larger scheme of modernizing the reindeer industry. Palmer lamented that reindeer handling in Alaska suffered “from lack of application of improved modern methods.”⁵⁸ What he meant was modern science, and more specifically, the concept of rotational grazing. This concept Palmer imported to Alaska through the US Department of Agriculture from sheep and cattle range science in the west. In theory, this approach made maximum use of available forage by moving herds between a series of summer and winter pastures, and prevented overgrazing by allowing some tracts of land to go fallow each year. In order to make this kind of grazing possible, Palmer noted, the industry’s management and infrastructure would need careful overhaul and supervision. The territory must be divided into grazing units; fences should be erected to keep herds separate and prevent strays or mixing; corrals should be constructed to facilitate round-ups and slaughter; and permanent winter cabins needed to be built to ease herd management in winter, the most important phase for the protection of *Cladonia*. But most importantly, rotational grazing depended on open herding, where animals were free to select food on their own. This approach contrasted with the Saami tradition of close herding, where herders and animals stayed together as they moved over the land. Both Palmer and Nelson agreed that rotational grazing replaced the “crude methods of the original herders” and instilled in the industry “definite scientific investigations [and] oversight.”⁵⁹

As we consider the relationship of the Porsilds and Palmer—and the connections among scientists, the Canadian state, and the Canadian Reindeer Project—we must remember that the concepts of winter forage and

Section	Composition					Density	Palatability	Forage value
	Lichen	Browse	Sedge	Weeds	Moss			
Coast summer range:								
St. Lawrence Island.....	0	5	91	3	1	90	65	58.5
Kivalina.....	5	15	47	31	2	79	68	53.7
Kotzebue Sound.....	10	26	51	5	8	93	64	59.5
Seward Peninsula.....	7	15	53	24	1	68	60	40.8
Norton Sound.....	11	22	50	5	12	92	51	46.9
Yukon-Nunivak Island.....	9	15	57	15	4	90	60	54.0
Kuskokwim.....	6	40	34	17	3	70	67	46.9
Average.....	7	20	55	14	4	83	62	51.4
Interior summer range:								
Broad Pass.....	18	28	27	12	15	96	70	67.2
Gulkana-Tangle Lakes.....	16	34	29	10	11	88	68	59.8
Average.....	17	31	28	11	13	92	69	63.5
Coast winter range:								
St. Lawrence Island.....	65	12	2	11	10	40	80	32.0
Kotzebue Sound.....	50	25	15	10	0	60	70	42.0
Seward Peninsula.....	50	15	30	5	0	70	75	52.5
Norton Sound.....	50	10	30	4	6	87	67	58.3
Yukon-Nunivak Island.....	50	10	30	2	8	99	66	65.3
Kuskokwim.....	47	30	10	3	10	70	70	49.0
Average.....	52	17	20	6	6	71	71	50.0
Interior winter range:								
Broad Pass.....	50	20	8	4	18	85	76	64.6
Gulkana-Tangle Lakes.....	53	23	11	6	7	85	83	70.5
Average.....	52	22	10	5	13	85	80	67.5

¹ Forage value derived by multiplying the percentage of density of forage stand by the percentage of palatability.

FIG. 3.1: Lawrence Palmer quantifies the potential of the arctic landscape based on the seasonal forage needs of reindeer and the types of vegetation along coastal and interior Alaska. Table by Lawrence Palmer, "Progress of Reindeer Grazing Investigations in Alaska," United States Department of Agriculture Bulletin 1423 (Washington, DC, 1927), 20.

carrying capacity hinged on the application of a scientific management regime. This regime made room for the expertise of scientists to guide the activities of Saami herders and Native apprentices. To visualize the linkages between scientific knowledge, state supervision, and the reindeer industry, consider the tables and maps Palmer presented to his readers in his 1926 US Department of Agriculture publication (Figs. 3.1–3.2). Through reference to the chemistry of various tundra plants and the spatial distribution of what he called "tundra types," Palmer argued for the merits of a rational, scientific manager to preside over people and nature in the north. Such a person could consider the particular nutritive value of *Cladonia* and the landscape mosaic of topography, vegetation, and climate, while directing the right number of herders and reindeer to the right places at

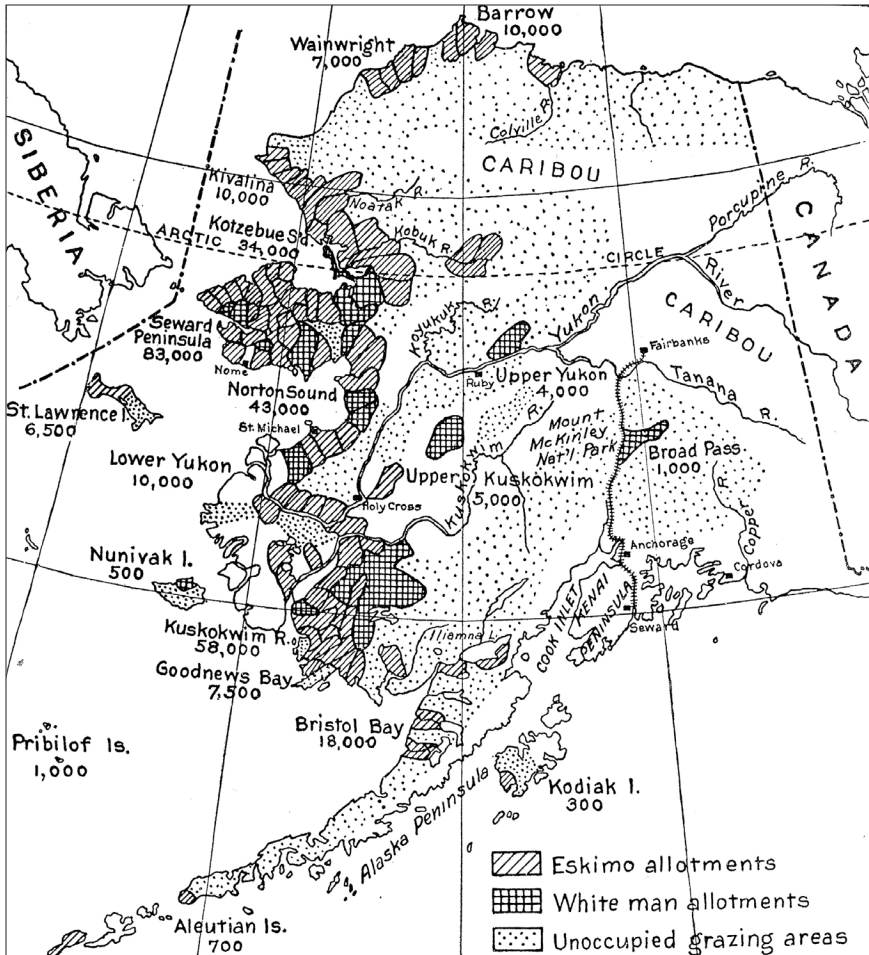


FIG. 3.2: Lawrence Palmer converts the arctic landscape into the terms of reindeer ecology. Map by Lawrence Palmer, "Progress of Reindeer Grazing Investigations in Alaska," United States Department of Agriculture Bulletin 1423 (Washington, DC, 1927), 2.

the right times. Winter forage, carrying capacity, and grazing units were thus mechanisms for what scholars have called *legibility*, the capacity of governments to represent the resources of particular territories so as to exploit them. Palmer's charts and maps provide telling examples of "the radical reorganization and simplification of flora to meet man's goals."⁶⁰

The Porsilds' studies with Palmer brought science and the state a long way from the Royal Commission on Muskox and Reindeer. Enclosures and quadrat studies produced new knowledge about the tundra, which highlighted a set of problems, solutions, and problem solvers unique to a style of reindeer management founded on grazing ecology. Lichens and "reindeer mosses" were known to Canadian bureaucrats before the Porsilds' visit with Palmer, but *Cladonia*, "winter forage," "carrying capacity," and "tundra types" had not yet been quantified or made intelligible. Similarly, the creation of a scientific grazing manager reordered the positions of Saami, native Inuit, government teachers, and federal administrators relative to one another. Armed with charts, maps, specimens, and observations, the scientist-manager abstracted himself from the day-to-day operations of the industry, even as he governed them. Perhaps paradoxically, this scientific and managerial ethos meant that Saami could remain authorities on tacit knowledge about reindeer in ways that no longer threatened researchers or bureaucrats. The novelty of Palmer's ecology and its applications might be why some Alaskans considered him not a practical reindeer man, but a man with a briefcase, issuing figures pulled from thin air.⁶¹ It may also account for renowned ecologist Frederic Clements' interest and support of Palmer's research, which he called "exceedingly important and helpful" in the development of ecological science.⁶²

When the Porsild brothers were given orders to learn what Palmer had to teach them about reindeer, a passage was opened between the Canadian Reindeer Project and scientific ideas emerging from the Fairbanks station. The Porsilds visited extensively with Palmer, touring his experimental pastures and travelling with him around Alaska to observe herds. Palmer walked the brothers through the practices of marking, corralling, and butchering, and shared "all his reindeer files" with Alf Erling Porsild. The Bureau biologist also conveyed his views about the advantages of open herding, and, by association, the superiority of "modern" methods for handling reindeer over Native Alaskan and Saami ways of knowing the animal.⁶³

The Porsilds left Nome, Alaska, in December 1926, completing a trek to the Mackenzie Delta to test a possible route for the delivery of the herd to Canada. Upon arriving in Aklavik, Alf Erling Porsild wrote O. S. Finnie to proclaim the reconnaissance mission with Palmer a success. Porsild developed his observations of the northern tundra and Inuit culture through

the lens of Palmer's science. Noting the plant cover in the Mackenzie Delta flats, Porsild characterized them as one of many tundra "types," which "entirely conform[ed] with similar deltas of Buckland, Kubuk, or Noataq in Alaska." While on his way to the International Boundary, he observed the herds owned by Inupiat in the vicinity of Point Barrow. Porsild lamented that the "lack of white initiative and of adequate supervision" had resulted in poor management and even a notable decrease in the size of reindeer.⁶⁴ To tame the Arctic, one first needed to recognize its wild ways.

Home on the Range: Surveying the Canadian North, Building the Canadian Reindeer Project

Between 1926 and 1931, Alf Erling Porsild visited Alaska twice (once to study with Palmer and a second time in 1929 to select the animals to comprise the Canadian herd), scoured the Canadian north for a home for reindeer, and also visited Kautekeino, Norway, to hire three Saami families to teach Inuit how to herd.⁶⁵ Ultimately, Porsild recommended that only two districts, the Mackenzie Delta and the Dease River valley, were suitable for a governmental reindeer herd.⁶⁶ Over the next few years, Porsild helped build Reindeer Station, oriented the Saami families to the place, and waited for the herd to arrive.⁶⁷ When viewed together, these activities and the reports Porsild wrote about them reveal how Palmer's regime of reindeer configured Porsild's observations and conclusions, and the final construction of the Canadian Reindeer Project.

Between April and August 1927, A. E. Porsild and his brother completed a survey of the "Husky Lakes" region between present-day Inuvik and Tuktoyaktuk. Porsild was hopeful this landscape could house the Canadian Reindeer Project. "Magnificent lichen cover over vast areas," he scribbled in his journal. "50 to 80% [of which are] pure lichen." With excitement, he pictured the region with Palmer's lichen ecology in mind: "*Cladonia rangiferina* and *Cl. silv.* and *Cl. Uncinalis*, *Cl. alpestris*, *Cetr. aiv.* and many others. *Cladonia rangiferina* and *Cl. silv* probably covers more ground than all the rest together. ... This lake would be ideal location for winter reindeer camp."⁶⁸ Based on his observations of forage in the area, Porsild estimated the country could support up to 250,000 reindeer.⁶⁹

The carrying capacity of the Husky Lakes region did not dwarf the other areas that Finnie asked the Porsilds to study, which included the shores of Great Bear Lake and the Keewatin District. In 1928, the brothers inspected the valley of the Dease River, which extends northeast of Great Bear Lake, and the “northern plains” running south and west of the lake. Alf Erling Porsild described the region as a “natural grazing unit,” as it was “closed in from all sides” and afforded abundant vegetation. But he increased the number of acres there to be allotted per reindeer. These grazing units presented a “tundra type” different from the Mackenzie Delta, and Porsild found it difficult to estimate grazing potential in this “unmapped country.” Still, the botanist suggested that the twenty-five million acres of the Great Bear Lake basin could support a total of three hundred thousand reindeer.⁷⁰

The Great Bear Lake basin presented other ecological problems particular to reindeer. The southern shores of the lake were “too heavily timbered to make herding and control of tame reindeer practicable.”⁷¹ But more importantly, both the Dease Valley and the northern plains grazing units offered little protection from mosquitoes, the ubiquitous, though temporary, pest of reindeer and reindeer industries. A. E. Porsild’s diaries are peppered with comments about how annoying the mosquitoes could be, as well as how troublesome they were to effective reindeer management. When visiting Palmer in 1929, Porsild learned that nearly fifty head of Palmer’s stock at Fairbanks had been killed by mosquitoes in the previous year. In 1936, Porsild spelled out the consequences of mosquitoes for the potential expansion of reindeer industries. “Nowhere in the area under consideration are the hills high enough to permit reindeer to escape flies during the summer,” he concluded. For this reason, Porsild surmised, reindeer ranching would be “limited to the sea-coast and adjacent hinterland.”⁷²

Alf Erling Porsild’s thoughts on *Cladonia*, carrying capacity, and mosquitoes make clear how an enriched awareness of ecology was at play in siting the Canadian Reindeer Project. This ecological knowledge found its clearest expression in descriptions of vegetation in the Mackenzie Delta, the eventual home for Canadian reindeer. “Reindeer ranching under a system such as has been evolved in Alaska,” he argued, “requires summer and winter pastures.”⁷³ With rotational grazing in mind, Porsild admired the patchwork of tundra plants evident in the Mackenzie Delta

and the arctic coast. He employed Palmer's models of tundra types and the Alaskan scientist's ecological counting methods to determine the exact proportion, distribution, and nutritive values of sedges, grasses, and lichens.⁷⁴ In this grazing unit, Porsild pointed out that the highest parts of the interior were covered by a "hard and fairly dry type of tundra," while low-lying areas were comprised of brackish lakes and lagoons. "Although not so rich in succulent grasses and herbs as the Alaska tundra," Porsild wrote, "this type of pasture is nevertheless more valuable as summer pasture for reindeer, as it is not so susceptible to damage by the trampling of grazing herds." Ranking the "Husky Lakes" region as the best winter grazing land in Canada, Porsild commented on its "high percentage of palatable species," and the possibility for its "maximum development." In one turn of phrase, Porsild even pictured reindeer in this winter pasture "put[ting] on their back fat," directly linking the growth of plants with the growth of a northern reindeer industry.⁷⁵

Porsild's observations did not seem to favour the obstacles or opportunities of reindeer in Canada, but rather the logical consequences of ecological data for the institution of animal husbandry. His attention to mosquitoes and forage makes this clear, as does his impression of the Hudson Bay coast. In 1929–30, Porsild teamed with the Royal Canadian Air Force to perform aerial surveys of vegetation on the shores of Hudson Bay. While exhilarated by the plane's ability to ease the rigours of fieldwork, Porsild admitted that the Keewatin district was poor country for reindeer. He later wrote that the flights proved this area was "entirely unsuited to reindeer"; viewed from a plane, "the almost total absence of soil and closed plant cover is most striking."⁷⁶ Ironically, then, ecology made reindeer possible in the Mackenzie Delta even as it circumscribed its possibilities within Canada. As historian P. Wendy Dathan has noted, just as the Royal Commission's grand plans for reindeer came into being in the Delta through scientific research on lichens, the application of this knowledge to other potential reindeer landscapes confirmed that Canada's north would never boast a vast industry.⁷⁷

Porsild did not only apply his new knowledge to natural conditions, he also used it to affirm ideas about the social organization of the Project. In his journals and his reports to the Department of Interior and the Royal Geographical Society, Porsild found evidence to support a hierarchical regime of supervision over grazing units, Saami instructors, Inuit herders,

and the tundra itself. While crossing from Barrow, Alaska, to Aklavik in the winter of 1926–27, Porsild met Tarpoq, an Inupiat man and owner of a reindeer herd. Porsild found that Tarpoq was “a good reindeer man under the supervision of a white man,” but when he had been left unsupervised by the US Bureau of Education, he started to “neglect his herd when his increase and profits is [*sic*] not up to his expectations.”⁷⁸

Financial concerns and the need for governmental oversight animated Porsild’s engagement with local Inuit in the Mackenzie Delta region. While at Atkinson Point, Porsild noted that the Inuvialuit had “too much easy cash” and had not yet learned the value of caring for their possessions. Moreover, he found that in the region between the international boundary and the Mackenzie Delta, Inuit had given up their customary seal hunt in favour of trapping fox, as the latter activity afforded them enough money to buy dog food (rather than hunt seal for it) and purchase other goods, like flour, tobacco, rifles, and ammunition. The botanist also worried about the future of Inuit in a fur economy, which was more volatile than one based on herding.⁷⁹ Later, in 1929, Finnie echoed Porsild’s sentiments, suggesting that the “natives ... might be seriously affected by the periodic fluctuations in the numbers of fur-bearers and by changes in the fur markets.”⁸⁰ For Porsild and Finnie, reindeer helped subdue these wild elements of the north.

Scientists and state officials drew clear boundaries between white society and Inuit culture even as reindeer projects meant to erase them. But they sometimes got their lines crossed on the roles of scientists and Saami herders. While the reindeer were being driven from Alaska to the Mackenzie Delta, they faced incredible delays: a trip that was estimated to take eighteen months was completed in just under five years. These delays inflamed relationships between the Saami, the Canadian government, and Porsild. Anxious for the herd to arrive in Canada, bureaucrats in Ottawa suggested that Porsild relieve the current supervisor of the drive, Saami Andy Bahr, and guide the animals to their destination. Porsild was infuriated, both because he had advocated for “white men” to lead the drive originally and because he interpreted this order as a demotion from his position as scientist. On the verge of losing both Porsild and the reindeer, a representative of the Lomen Corporation of Alaska stepped in, paying the botanist a handsome \$2,500 to manage the delivery of the herd.⁸¹

Porsild's conclusions, themselves a result of Palmer's teachings, directly informed the creation of a series of instruments to further guide the Canadian Reindeer Project. In 1931, he travelled to Kautekeino, Norway, as the Project's ambassador, identifying and selecting three Saami families to relocate to the Mackenzie Delta to train Inuit in reindeer herding. In 1931 and 1932, Porsild chose the site for and helped build Reindeer Station, the government's first town in the Arctic.⁸² In 1933, following Porsild's recommendations, Parliament established federal ordinances to protect the reindeer as a national resource and created a six-thousand-acre Reindeer Grazing Preserve to contain and control northern pastures, as well as who trapped or hunted in them. In that year, the Inter-Departmental Reindeer Committee, having formed to consult Department of Mines and Resources staff on best practices for the reindeer industry, nominated Porsild to become the Canadian Reindeer Project's first superintendent.⁸³ In October 1935, after supervising the herd's arrival and the first six months of operations at Reindeer Station, Porsild left the north for Ottawa. After spending ten summers and seven winters in the Arctic, "getting Canada's first Government-owned reindeer off to a good start," he took up new roles as chief botanist at the National Herbarium and as a consultant for the Interdepartmental Reindeer Committee.⁸⁴ His continued investment in the Canadian Reindeer Project throughout the early 1930s is remarkable, especially given the retrenchment of the civil service in Canada and the reorganization of northern bureaucracies following the Great Depression.⁸⁵

By 1940, the reindeer inhabited a landscape that looked quite different from that which Porsild had surveyed in the late 1920s. The image of thousands of reindeer the botanist had projected onto the landscape had been replaced by regular, seasonal movements of people and animals. In the spring, Saami herder Mikkel Pulk, together with Inuit apprentices, pushed the main herd from its winter range to the coastal area, where fawning commenced in early April and lasted until June. In the summer, the reindeer were driven to Richards Island, where consistent winds dispersed mosquitoes. Before the annual roundup, which took place at the summer corral near Kittigaruit, herders caught fish and harvested whales, and prepared this meat for the long winter.⁸⁶ Reindeer supervisors, hired through the Department of Mines and Resources, directed the schedule of the main herd and supervised the nascent, Native-owned herds.⁸⁷ In

addition, they kept supplies and equipment on hand, maintained communication via radio with government agents in Aklavik, and arranged for the training in reindeer husbandry of as many young boys as possible.⁸⁸ Finally, supervisors issued regular reports to Ottawa to be reviewed and evaluated by the Interdepartmental Reindeer Committee. That these movements of supervisors, herders, apprentices, and reindeer had become routine by 1940 belies the dramatic transformations in the scientific understanding of arctic nature and government capacity that had taken place in the previous two decades.

Conclusion: The Experimental State of Nature

Despite these foundations, the Canadian Reindeer Project fell apart in a matter of twenty years. While six teams of Inuit became owners of herds after 1938, all of these operations had collapsed by 1959. In that year, the Canadian government handed the project to private developers, having little to show for its million-dollar investment. It continued to be passed back and forth between private and public hands throughout the 1960s and 1970s. Today, the small extant herd in the Mackenzie Delta is owned in part by a private individual and in part by the Inuvialuit Regional Corporation.⁸⁹

As reindeer herding in the western Arctic fell apart, activities in the late 1940s and early 1950s reinforced the project's status as a product of governments testing out science and development in a so-called wild north. Inspired by Cold War geopolitics—which identified the western Arctic as a vulnerable border zone with the Soviet Union—Ottawa went north with renewed vigour in the 1940s and 1950s. Bureaucrats placed high priority on defense and modernization initiatives, which relegated the Canadian Reindeer Project to an antiquated status. Kittigaruit, where the reindeer were corralled in the summer, became home to a radar station in the mid-1940s. By the mid-1950s, the animals grazed the Yukon North Slope's coastal vegetation in the shadows of Distant Early Warning Line stations.⁹⁰ As Ottawa planned the relocation of Aklavik and Reindeer Station residents to the new "East-Three" site (Inuvik), the feasibility of maintaining the reindeer program was brought into question.⁹¹ By 1958, much of Reindeer Station's labour pool had been channelled toward

construction projects related to “East Three” and defense.⁹² The government transferred the herd to private developers in that year, maintaining a staff person at Reindeer Station for oversight.⁹³

The demise of government-sponsored reindeer herding coincided with the rise of high modernism in the north. High-modernist ideals and priorities helped reinforce reindeer herding as an outmoded form of development. In the 1950s, Canadian officials, Interdepartmental Reindeer Committee members, and university researchers began wondering why this project—seemingly destined to succeed—never lived up to its potential. Drawing on ecological and sociological analyses of the Alaskan industry, they turned the Canadian Reindeer Project into a case study of historic attempts to develop the north. Analysts hung the Project’s troubles on Inuit culture, immature science, and poor planning.⁹⁴ But beyond the particulars was a broad conclusion about the past. Both government and science had moved on from interwar ways into a new era of commanding a strategic yet vulnerable environment.

The Canadian Reindeer Project makes clear how science and state priorities for the Arctic call into being new relationships between humans and nature. By the end of the First World War, Ottawa held little institutional knowledge for understanding the north as reindeer country, despite having introduced reindeer to several parts of Canada over the turn of the century. This kind of information—maps, statistics, and archives of research papers—had been instrumental in contemporary cases of mining and commercial fishing elsewhere in the north. There, bureaucrats turned to scientists at the Geological Survey of Canada and the Department of Fisheries to assist private industry in manipulating human and natural resources.⁹⁵ Legibility in the Subarctic was a product of well-established ideas, communities, and stereotypes being transported to terrestrial and aquatic environments. The reindeer, it turned out, was a whole other animal.

There was no university system in place to provide a pool of students trained in animal husbandry science, northern botany, or arctic ecology. There were no archives, maps, or statistics upon which bureaucrats could rely to plot their reindeer schemes. The Royal Commission on Muskox and Reindeer was one attempt to create this database and to define the characters and characteristics of reindeer expertise; but this led to false starts, including Vilhjalmur Stefansson’s spectacular failure on Baffin Island.

In response, the government turned to Alaska, which by 1926 had begun to amass a wealth of research through biologist Lawrence Palmer, and to Denmark, which had already conducted arctic science and empire work in Greenland. The government also imagined Inuit as central to Canada's success in the north, not just as a population that could be supplanted by fishermen or prospectors.

Just as state interests forged new commitments to science, international partners, and local residents, so too did the production of scientific knowledge about arctic life alter how state agents understood the north and their capacity there. Visions of vast herds had preceded Palmer and the Porsilds, but the biologists created the instruments and concepts by which the dream of a domesticated Arctic could become a reality. Through notions of lichens, tundra types, and carrying capacity, these scientists helped bureaucrats to quantify northern terrain, to see it not as barren or backward, or even as an unending prairie, but as a set of districts with varying potential for people and reindeer. At the same time, ecologists and bureaucrats played on widely held fears of wildness—in markets, Native cultures, and game populations—to underscore the stability that animal husbandry economies would bring to people and nature in the Arctic. The arrival of reindeer in Canada, then, can help scholars think carefully about the nature of power and the power of nature. Interventions with domesticated species required nuanced knowledge of the arctic environment, while ecological science showed both the opportunities for government action and the limits northern nature imposed upon southern ambition.

The Canadian Reindeer Project, and especially Alf Erling Porsild's involvement in it, suggests the value of approaching northern history not only from the perspective of environmental history, but of the history of science, as well.⁹⁶ As a sparsely populated region distant from North American metropolitan centres, the Arctic did not enter the orbits of public consciousness and national identity via traditional pathways. Southerners have not consumed the far north through personal encounters with physical landscapes or goods that originate from it, but rather by subscribing to ideas produced about the place. As Emilie Cameron documents in her chapter in this volume, modern ecologists recapitulate colonial power dynamics through their research on arctic climate change.⁹⁷ Yet the place of science in the north is not guaranteed—it is created, contested, and sustained in time. The Reindeer Project was Canada's first experiment with

scientific resource development in the Arctic, one founded not on mining and its disciplines, but on other forms of nature and knowledge. And it was not the last experiment of its kind. As other chapters in this volume make clear, ecological field research, state power, and manipulations of northern nature intensified and further intertwined following Second World War. These post-war episodes, then, amplify the Reindeer Project's importance and the legacy of the interwar period in Canadian history.

This point can be crystallized by returning to the ways historical actors referred to the Canadian Reindeer Project. In 1936, a crowd of military officials, academicians, interested citizens, and Department of Interior bureaucrats gathered at the Royal Geographical Society to hear Alf Erling Porsild speak on "The Reindeer Industry and the Canadian Eskimo." In the discussion that followed the presentation, Albert Charles Seward, a professor of Botany at Cambridge University, offered his support for Porsild's work and the Canadian government's initiative: "I feel that you will agree with me when I congratulate Mr. Porsild on having most successfully carried out this great experiment," Seward announced. "It was an experiment which I think there is no doubt will yield very valuable results, not only as regards value to the Dominion of Canada but particularly in improving conditions under which the Canadian Eskimo are living in those far northern regions."⁹⁸

At the Royal Geographical Society event, Professor Seward chose his words carefully. The Canadian Reindeer Project was a "great experiment"—a study of how the Canadian government could administer the Arctic and its resources more effectively. It was *experimental*, relying upon an unorthodox technology of a foreign domesticated species, creating innovative alliances among ecological botanists, private corporations, and new governing bodies, and building new spaces for development in research stations, grazing preserves, and herding villages. It was also *experimentalist*, as the project employed professional ecological scientists whose quadrat studies and surveys yielded crucial data to guide the implementation of a government-run animal husbandry economy and civilizing program. Without exaggerating or downplaying it, the Canadian Reindeer Project was an attempt to remake the north and Canada's relationship to it. Reindeer Station and the reindeer country that surrounded it became a natural laboratory for state power and scientific knowledge, the best expression of an experimental state of nature.

Notes

- 1 Library and Archives Canada (hereafter cited as LAC), microfilm reel M-1958, A. E. Porsild, "Trip to Alaska to Select Reindeer to be Purchase for Delivery to the Mackenzie Delta, NWT, Autumn and Winter, 1929–1930. Daily Journal of A. E. Porsild," p. 39.
- 2 A note about terminology: in this essay, I refer to Native northerners living in the western Arctic. The region of the western Arctic includes portions of Alaska, Yukon, and the Northwest Territories lying above the Arctic Circle, roughly corresponding to the area between Port Hope, Alaska, and Kugluktuk, Nunavut, on today's map. "Native northerners" is a broad category, which I specify by referring to Inuit (as opposed to Dene). Within the category of Inuit are Inupiat, (Alaskan Inuit) and Inuvialuit (Canadian Inuit living in the Mackenzie Delta and on the Yukon coast). I also use the term Alaskan Natives to refer to Inupiat, Aleut, and Native Americans in Alaska. Historical actors often referred to Inuit as Eskimos. Such a reference continues in modern-day Alaska, but has been replaced with other terms in Canada.
- 3 A short history of Porsild's involvement with the Canadian Reindeer Project is given in Alf Erling Porsild, *Reindeer Grazing in Northwest Canada: Report of an Investigation of Pastoral Possibilities in the Area from the Alaska-Yukon Boundary to Coppermine River* (Ottawa: F. A. Acland, 1929), 6–14, 29. The language of "experiment" was explicitly used in reference to a governmental herd as early as January 1920. See LAC, RG 33 105, "Royal Commission: Reindeer and Muskox Industry, Vol. 1: Hearings of Royal Commission on Muskox and Reindeer." The "Canadian Reindeer Project" was also likely to be called "Canada's Reindeer Experiment," as it was in 1936 in the publication R. H. G. Bonnycastle, "Canada's Reindeer Experiment," *Proceedings of the North American Wildlife Conference*, 3–7 February 1936, Senate Committee Print, 74th Congress, 2nd Session (Washington, DC, 1936), 424–27. Numerous newspaper articles also referred to the project as an experiment. For one example, see "Canadian Reindeer are doing very well," *Globe and Mail*, 1 October 1939.
- 4 For a very useful and comprehensive treatment of Porsild's research and correspondence during his "reindeer years," see Patricia Wendy Dathan, "The Reindeer Years: Contribution of A. Erling Porsild to the Continental Northwest" (master's thesis, McGill University, 1988). Dathan's thesis is not explicitly concerned with the relationships between science and the state, but rather Porsild's contributions to an as-yet inchoate discipline of circumpolar Arctic botany between the 1920s and 1940s. As I was finishing this chapter, Dathan published this monograph from her research: Wendy Dathan, *The Reindeer Botanist: Alf Erling Porsild, 1901–1977* (Calgary: University of Calgary Press, 2012), an extensive treatment of Porsild from a biographical perspective.
- 5 Trevor H. Levere, *Science and the Canadian Arctic: A Century of Exploration, 1818–1918* (New York: Cambridge University Press, 1993).

- See also Stuart E. Jenness, *Stefansson, Dr. Anderson, and the Canadian Arctic Expedition, 1913–1918* (Gatineau, QC: Canadian Museum of Civilization, 2011).
- 6 For an example of historians viewing the Canadian government as neglectful of the north during the interwar period, see Kenneth Coates, P. Whitney Lackenbauer, William R. Morrison, and Greg Poelzer, *Arctic Front: Defending Canada in the Far North* (Toronto: Thomas Allen Publishers, 2008), 54–55. For recent interpretations of the interwar north by environmental historians, see Janice Cavell and Jeff Noakes, *Acts of Occupation: Canada and Arctic Sovereignty, 1918–1925* (Vancouver: UBC Press, 2010); Liza Piper, *The Industrial Transformation of Subarctic Canada* (Vancouver: UBC Press, 2009); John Sandlos, *Hunters on the Margin: Native People and Wildlife Conservation in the Northwest Territories* (Vancouver: UBC Press, 2007); and Morris Zaslow, *The Northward Expansion of Canada, 1914–1967* (Toronto: McClelland and Stewart, 1988), especially 141–45. See also the chapters by Tina Adcock and Marionne Cronin in this volume.
 - 7 See the chapters by Tina Adcock and Jonathan Peyton in this volume.
 - 8 Bonnycastle, “Canada’s Reindeer Experiment,” 424.
 - 9 In the western Arctic, hunting pressure on the caribou intensified through the expansion of commercial whaling industries on the Beaufort Sea. Two good sources on this phenomenon have been provided by John Bockstoce. See John R. Bockstoce, *Whales, Ice, and Men: The History of Whaling in the Western Arctic* (Seattle: University of Washington Press, 1986); and John R. Bockstoce and Daniel B. Botkin, “The Historical Status and Reduction of the Western Arctic Bowhead Whale (*Balaena mysticetus*) Population by the Pelagic Whaling Industry, 1848–1914,” *Scientific Reports of the International Whaling Commission*, Special Issue, no. 5, 107–41.
 - 10 There are many historical records that suggest the various cultural and economic benefits of reindeer in the interwar period. For one example, consider C. L. Andrews, *The Eskimo and his Reindeer in Alaska* (Caxton Printers, 1939), 30.
 - 11 Gilles Seguin, “Reindeer for the Inuit: The Canadian Reindeer Project, 1929–1960,” *Muskox* 6, no. 38 (1991): 1–10. John Sandlos, “Where the Reindeer and Inuit Should Play: Animal Husbandry and Ecological Imperialism in Canada’s North” (unpublished manuscript). My thanks to the author for allowing me to review this piece.
 - 12 C. L. Andrews, *The Eskimo and his Reindeer in Alaska* (Caldwell, ID: Caxton Printers, 1939), 30–37. Sandlos, “Where the Reindeer and Inuit Should Play,” 4–7.
 - 13 I return to these themes with a more specific treatment below. See notes 28–33.
 - 14 For an overview of the “Arctic Pastoral” concept, see Sandlos, *Hunters at the Margins*, 161–70.
 - 15 Randal Pokiak, *Inuvialuit History* (Inuvik: Inuvialuit Cultural Resource Centre, n.d.), 58 (accessed 26 January 2011). I would like to thank the Inuvialuit Cultural Resource Centre for granting me access to its materials, as well as for

- offering gracious support and patience with my questions of them.
- 16 This amendment appears to have been an attempt to legitimize federal appropriations for forms of relief that were distributed to Inuit through missions and fur posts. See John Leonard Taylor, *Canadian Indian Policy During the Inter-War Years, 1918–1939* (Ottawa: Department of Indian Affairs and Northern Development, 1984), 87–88.
- 17 See Sandlos, *Hunters at the Margins*, 126.
- 18 Pokiak, 44–45.
- 19 This quotation is Pokiak’s, from *Inuvialuit History*, 58. Elisa Hart records other accounts of Mangilaluk in *Reindeer Days Remembered* (Inuvik: Inuvialuit Cultural Resource Centre, 2001), 14.
- 20 For a comparison of national parks and the ordinances used to establish the Reindeer Grazing Preserve, consider the minutes of the Inter-departmental Reindeer Committee of 18 June 1935. LAC, microfilm reel T-1332, vol. 82, file 7128, “Lapp herders, 1929–1938.” For a discussion of the relationships between ideas of nature in relation to laboratories and other scientific spaces, see Robert Kohler, *Landscapes and Labscapes: Exploring the Lab-Field Border in Biology* (University of Chicago Press, 2002).
- 21 See LAC, RG 33 105, “Royal Commission: Reindeer and Muskox Industry, Vol. 1.” The quotation in the above paragraph is from George Comer (p. 32). Notes from Jenness’s lecture are found in LAC, Rudolph Martin Anderson fonds, MG 30 40, vol. 14, file 1–eskimos, “A Lecture delivered at the Arts and Letters Club, by Diamond Jenness, Victoria Memorial Museum, Jan 9, 1923: ‘Our Eskimo Problem.’”
- 22 Porsild, *The Reindeer Industry and the Canadian Eskimo*, 4.
- 23 This was the subtitle to the 1922 report of the Department of the Interior, *Reindeer and Muskox: Report of the Royal Commission upon the possibilities of the Reindeer and Musk-Ox Industries in the Arctic and Sub-Arctic Regions* (Ottawa, 1922). See the first page of the report for the full subtitle.
- 24 *Reindeer and Muskox*, 18. Porsild documented the existing knowledge on flora in the western Arctic in *Canada’s Western Northland: Its History, Resources, Population, and Administration* (Ottawa: Department of Mines and Resources, Lands, Parks, and Forests Branch, 1937), 130–41.
- 25 The list of witnesses can be found in Department of Interior, *Reindeer and Muskox*, 9–11.
- 26 *Reindeer and Muskox*, 12.
- 27 *Reindeer and Muskox*, 18.
- 28 The published report lists these witnesses, but only prints excerpts of their testimony. The records of the hearings are found in LAC, RG 33 105, under the titles “Royal Commission: Reindeer and Muskox Industry, Vol. 1” and “Royal Commission: Reindeer and Muskox Industry, Vol. 2.” The quotation is from Bishop Isaac Stringer at the 4 February 1920 meeting (pp. 197–98 of the Vol. 1 hearings).
- 29 *Reindeer and Muskox*, 19–24.
- 30 Seguin and Sandlos both discuss the Baffin Island situation. See Seguin, “Reindeer for the Inuit,” 1–10, and Sandlos, “Where the Reindeer and Inuit Should Play,” 9.

- 31 The details of Lopp's report were found in several sources. For Lopp's thoughts as he pieced together his report, see Alaska and Polar Regions Department Archives, Elmer E. Rasmuson Library, University of Alaska Fairbanks (hereafter cited as APR-UAF), Kathleen Lopp Smith Family Papers, ser. 4, box 2, folder 4, Lopp to R. H. Parsons, 7 September 1925. For his final thoughts, see APR-UAF, Kathleen Lopp Smith Family Papers, ser. 4, box 2, folder 5, Lopp to R. H. Parsons, 1 July 1926.
- 32 For the interaction between Sapir and Stefansson, see LAC, Rudolph Martin Anderson Fonds, MG 30 40, vol. 11, file 8, "The Friendly Arctic." This file contains notes on the lecture as recorded by Anderson's wife, not a complete transcript. For correspondence between Stefansson and Carl Lomen, see Letter from Stefansson to Carl Lomen, June 20, 1927 Lomen Family Papers, ser. 2: Carl Lomen, Box 10, Folder 232, APR-UAF; Stefansson thanks Lomen for submitting a rebuttal to Lopp's report in the *Ottawa Morning Journal* in Letter from Stefansson to Carl Lomen, Apr 17, 1928, Lomen Family Papers, ser. 2: Carl Lomen, Box 10, Folder 232, APR-UAF. The details of Stefansson's bid for the Lomens to purchase land on Baffin Island are covered in Letter from Stefansson to Leonard Baldwin, July 20, 1925, Lomen Family Papers, ser. 2: Carl Lomen, Box 10, Folder 232, APR-UAF.
- 33 On Stefansson's controversial nature, see Richard Diubaldo, *Stefansson and the Canadian Arctic* (Montreal: McGill-Queen's University Press, 1978).
- 34 I deduce that northern experience and scientific training, when combined, were especially useful from the following quotation in the Royal Commission's report: "Your commissioners were fortunate in being able to secure much valuable information as to the potentialities, from a reindeer point of view, of the territory lying within about thirty miles of the Arctic coast, between the International Boundary on the west, and Kent peninsula on the east." *Reindeer and Muskox*, 26. This area was the exact area covered by the recent Canadian Arctic Expedition of 1913–18, and the International Boundary Survey of 1908–12.
- 35 O. S. Finnie to Gibson, January 1926, as quoted in Dathan, 32.
- 36 Much of the Arctic region at the time offered little inland transportation infrastructure for would-be surveyors. In order for a fieldworker to travel and "size up the situation" efficiently, as Finnie wished, he or she would have to master dog-sledding techniques, as there was no feasible alternative for covering ground after the open-water season.
- 37 For quotation at end of paragraph, see LAC, W. T. Lopp, 1925–1939, microfilm reel T-13267, vol. 759, file 4824, O. S. Finnie to Rev. Canon C. W. Vernon, 10 June 1929. See also LAC, RG 132, vol. 23, file 364, O. S. Finnie to W. H. Collins, 14 May 1928; LAC, RG 132, vol. 23, file 364, O. S. Finnie to M. O. Malter, 20 February 1928. See also Sandlos, "Where the Reindeer and Inuit Should Play," 10.
- 38 The details of this meeting between U.S. and Canadian officials are drawn from several sources. See

- LAC, RG 132, vol. 31, file 4492, Letter to A. E. Porsild, 23 March 1926. See also LAC, microfilm reel T13273, vol. 765, file 5095—Porsild, 1926–36, O. S. Finnie to Colonel Starnes, 19 May 1926. For more general descriptions of the hiring of the Porsilds, see North, *Exodus*, 27–34, and Dathan, 33–34.
- 39 See Sandlos, *Hunters at the Margins*; and Cavell and Noakes, *Acts of Occupation*.
- 40 In addition to these broader social and environmental patterns, the interactions of Finnie, Cory, and the U.S. reindeer men echo the complexities of the emergence of grazing sciences in America and Canada over the turn of the twentieth century. See John Sandlos, “Where the Scientists Roam: Ecology, Management, and Bison in Northern Canada,” *Journal of Canadian Studies* 37, no. 2 (2002): 93–129; Morgan Sherwood, *Big Game in Alaska* (New Haven: Yale University Press, 1981); and Christian C. Young, “Defining the Range: The Development of Carrying Capacity in Management Practice,” *Journal of the History of Biology* 31 (1998): 61–83. On Palmer, see Sherwood, 66–67. Of the wildlife specialists with the Bureau of Biological Survey in Alaska, there were Ernest P. Walker, W. H. Osgood, Alfred M. Bailey, Seymour Hadwen, and Lawrence J. Palmer. Only Walker was a “permanent employee.”
- 41 See LAC, microfilm reel T-13267, vol. 759, file 4824—W. T. Lopp, 1925–1939, O. S. Finnie to Moran, 4 December 1925. “Exploratory Engineer” seems to be an established class or rank within the governmental payroll system. On hiring a “Botanist” and “Assistant Botanist,” see LAC, microfilm reel T13273, vol. 765, File 5095—Porsild, 1926–36, vol. 765, O. S. Finnie to Moran, 20 April 1926.
- 42 LAC, microfilm reel T13273, vol. 765, File 5095—Porsild, 1926–36, vol. 765, Memo from R. A. Gibson, 19 April 1926.
- 43 See Dathan, 2–10, for a rich description of the Porsilds’ upbringing.
- 44 See LAC, microfilm reel T13273, vol. 765, file 5095—Porsild, 1926–36, O. S. Finnie to Messrs. A. E. and R. T. Porsild, 19 May 1926. See also Dathan, 48, and North, 28–35.
- 45 See Porsild, *Reindeer Grazing in Northwest Canada*, 5–6.
- 46 APR-UAF, Lomen Family Papers, ser. 2, box 10, folder 232, Vilhjalmur Stefansson to Carl J. Lomen, 20 June 1927. Stefansson wrote, “I think it would also be well to point out that the Porsild brothers coming from Greenland are from a country where there is no reindeer industry and where the wild reindeer (caribou) are practically extinct.” This is ironic, as Stefansson, who was born in Canada, was also from a country with no reindeer industry.
- 47 Finnie, *Canada Moves North*, 16. See also Percy Cox, Professor Seward, and Colonel Vanier, “The Reindeer Industry and the Canadian Eskimo: Discussion,” *Geographical Journal* 88, no. 1 (1936): 17–19. This paper was a published version of a discussion with A. E. Porsild after he presented his paper, “A Four Year Trail from Alaska to the Mackenzie Delta,” to the Royal Geographical Society.

- 48 Quoted in Dathan, 49.
- 49 N. R. Ellis, L. J. Palmer, and G. L. Barnum, "The Vitamin Content of Lichens," *Journal of Nutrition* 6, no. 5 (1933): 443–54. This paper references another: L. J. Palmer and G. H. Kennedy, "A Report on Digestibility in Reindeer. The Digestibility and Nutritive Properties of a Mixed Ration of Lichens and Oats, of Lichens Alone and of Alfalfa Hay Alone." The latter was, at the time, in the process of publication. Below, I cite sources that predate the Porsilds' arrival to demonstrate that Palmer was working on these studies in the early 1920s, and not just in the early 1930s.
- 50 Quoted in Dathan, 49.
- 51 APR-UAF, L. J. Palmer Collection (hereafter cited as LJP), box 2, folder 1, "Record of Members: Society of American Foresters."
- 52 L. J. Palmer and Seymour Hadwen, "Reindeer In Alaska," in *United States Department of Agriculture Bulletin no. 1089, Sept. 22, 1922* (Washington, DC: Government Printing Office, 1926), 19–23.
- 53 L. J. Palmer, "Progress of Reindeer Grazing Investigations in Alaska," in *United States Department of Agriculture Bulletin no. 1423, Oct., 1926* (Washington, DC: Government Printing Office, 1926), 1–11.
- 54 APR-UAF, LJP, L. J. Palmer to E. W. Nelson, 22 March 1923.
- 55 L. J. Palmer, "Progress of Reindeer Grazing Investigations in Alaska," 30. Palmer determined the nutritive quality of lichens by sending samples to the Bureau of Chemistry and the Bureau of Plant and Industry in Washington, DC. See National Archives Pacific Alaska Region, Anchorage, Alaska (hereafter cited as NARA), RG 75, Bureau of Indian Affairs, Lawrence J. Palmer Correspondence, box 2, Digestion Studies, 1920–34, L. J. Palmer to Chief of Bureau, Biological Survey, 6 November 1929.
- 56 NARA, RG 75, box 4, "Progress Report: Quadrat Studies," 1 November 1923."
- 57 L. J. Palmer, "Progress of Reindeer Grazing Investigations in Alaska," 31.
- 58 L. J. Palmer, "Progress of Reindeer Grazing Investigations in Alaska," 33.
- 59 L. J. Palmer, "Progress of Reindeer Grazing Investigations in Alaska," 3. For an interesting comparison between Palmer's science and the Lomen Corporation's business practices, see Carl J. Lomen, *Fifty Years in Alaska* (New York: D. McKay, 1954).
- 60 The best source on legibility remains James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*, (New Haven: Yale University Press, 1999). See, in particular, pp. 1–9.
- 61 "Extracts from Report of W. B. Miller on Kuskokwim Reindeer Investigations, Dated Jan 17, 1931," an addendum within LAC, RG 33 105, "Royal Commission: Reindeer and Muskox Industry, Vol. 1: Hearings of Royal Commission on Muskox and Reindeer" (Washington, DC, 1931). Palmer was described in the addendum as follows: "The new man comes here with his brief case full of formulas which he intends to apply. He publishes and describes their use as an improvement of methods, etc."

- 62 NARA, RG 75, box 4, Quadrat Studies, 1922–35, Frederic Clements to L. J. Palmer, 6 November 1926.
- 63 Quote about files in LAC, microfilm reel M-1958, A. E. Porsild, "Field Journal of an Expedition through Alaska Yukon and the Mackenzie District being a botanical reconnaissance with special reference to the suitability of the country for domesticated reindeer. Also many notes on the physiography of the country, its inhabitants, wild life and general economic conditions. 1926–1928, by AE Porsild," 8. See also Dathan, 53–62; and APR-UAF, LJP, box 3, folder 4, L. J. Palmer to Chief of Bureau, Biological Survey, 27 August 1926.
- 64 LAC, microfilm reel M-1958, A. E. Porsild, "Field Journal of an Expedition through Alaska Yukon and the Mackenzie District...", 57. Porsild, *Reindeer Grazing in Northwest Canada*, 14.
- 65 See note 7.
- 66 He later noted that the government preferred the Mackenzie Delta because its proximity to Alaska would ease the delivery of reindeer. Indeed, Finnie had already suspected that the Mackenzie District—a region much larger than the Mackenzie Delta—would be the best home for reindeer. See LAC, microfilm reel T13273, vol. 765, file 5095—Porsild, 1926–36, O. S. Finnie to Messrs. A. E. and R. T. Porsild, 19 May 1926.
- 67 Porsild, "The Reindeer Industry and the Canadian Eskimo," 6–10.
- 68 As cited in Dathan, 118.
- 69 Porsild, *Reindeer Grazing in Northwest Canada*, 40.
- 70 Porsild, *Reindeer Grazing in Northwest Canada*, 19–39.
- 71 Porsild, *Reindeer Grazing in Northwest Canada*, 34.
- 72 Porsild, "The Reindeer Industry and the Canadian Eskimo," 16.
- 73 Porsild, "The Reindeer Industry and the Canadian Eskimo," 6.
- 74 LAC, microfilm reel M-1958, A. E. Porsild, "Field Journal of an Expedition through Alaska Yukon and the Mackenzie District...", 70.
- 75 Porsild, *Reindeer Grazing in Northwest Canada*, 29–32. See also LAC, microfilm reel M-1958, letter from A. E. Porsild [no addressee indicated], 25 June 1927.
- 76 Porsild, "The Reindeer and the Canadian Eskimo," 6–7.
- 77 See Dathan, 134–84. Porsild's aerial surveys also suggest the complicated legacy of the airplane for scientific knowledge and governmental priorities in regard to the north. For more on this theme, see Marionne Cronin's and Tina Adcock's chapters in this volume.
- 78 LAC, microfilm reel M-1958, letter from A. E. Porsild [no addressee indicated], 16 June 1927. Porsild wrote, "The case of Tarpoq is not unique. Similar cases have been met with in other places in Alaska, when an eskimo, though a good reindeer man under the supervision of a white man, when left to himself, soon starts to neglect his herd when his increase and profits is not up to his expectations."
- 79 LAC, microfilm reel M-1958, A. E. Porsild, "Field Journal of an Expedition through Alaska Yukon and the Mackenzie District...", 73–78.
- 80 Porsild, *Reindeer Grazing in Northwest Canada*, 5–6.

- 81 For a summary of this controversy, see Dick North, *Exodus*, 195–97, 217.
- 82 There were other towns in the western Arctic at the time, but these had emerged in response to private industry. Herschel Island was a product of the commercial whaling industry, just as Aklavik, Fort McPherson, and Tuktoyaktuk were created as outposts of the fur trade. Reindeer Station, in contrast, was built from the ground up to service the government's reindeer program. Families were relocated from these outlying towns to the new settlement. This history prefigured the attempt in the late 1950s to relocate residents of Aklavik to the government hub of Inuvik.
- 83 NWT Archives (Yellowknife) (hereafter cited as NWTA), G79-069, file 1-3, "Minutes from a meeting of the Interdepartmental Reindeer committee," 18 January 1933.
- 84 LAC, microfilm reel M-1958, "To the Mackenzie Delta to inspect and report on Reindeer Experiment, June-August, 1947, Daily Journal of A. E. Porsild," 3.
- 85 On retrenchment, see North, *Exodus*, 170–72; and Richard Finnie, *Canada Moves North* (New York: Hurst and Blackett, 1942), 65–70. Finnie and Cory resigned at the end of 1931. The Northwest Territories and Yukon Branch was abolished, and its territories came under jurisdiction of the Dominion Lands Board.
- 86 Richard Finnie, *Canada Moves North*, 141. See also LAC, RG 109, vol. 491, file 111, A. E. Porsild, 1947 Report, 1–7. Porsild notes that between 1936 and 1947, the Canadian Reindeer Project sent Aklavik five thousand carcasses, amounting to 500,000 pounds of meat.
- 87 LAC, microfilm reel, T13323, vol. 822, file 7128—Lapp Herders, 1929–38, "List for File: Staff at Reindeer Station," 15 November 1935. Inuit who signed up as apprentices earned \$25 a month and a "ration" valued at \$200, along with meat and skins.
- 88 Canada, Northwest Territories Administration, Lands, Parks, and Forests Branch, *Canada's Reindeer* (Ottawa, 1940), 5–7.
- 89 R. M. Hill, *Mackenzie Reindeer Operations*, Northern Coordination and Research Centre, Department of Indian Affairs and Northern Development, August 1967.
- 90 Pokiak, 80. Hart and Cockney, 1. On the Bar-1 DEW Line site, see David Neufeld, "Commemorating the Cold War in Canada: Considering the DEW Line," *Public Historian* 20, no. 1 (1998): 9–19.
- 91 For a compelling history of Inuvik's construction in the 1950s and its effect on local labour and land use, see Dick Hill, *Inuvik: A History, 1958–2008: The Planning, Construction and Growth of an Arctic Community* (Victoria: Trafford Publishing, 2008), 38–59.
- 92 R. M. Hill, *Mackenzie Reindeer Operations*, Northern Coordination and Research Centre, Department of Indian Affairs and Northern Development, August 1967.
- 93 Hart, 84. On labour pool problems in conjunction with the DEW Line and Inuvik's construction, see NWTA, G1979-003-70-1, "Annual Report, Reindeer Station, April 1, 1958–March 31, 1959." The Canadian Reindeer Project did not end with Second World War—or even in 1959, as is implied here. It continued to be passed back and forth between private and public hands

- throughout the 1960s and 1970s. Today, the small extant herd in the Mackenzie Delta is owned partly by a private individual and partly by the Inuvialuit Regional Corporation.
- 94 On published analyses of the Canadian Reindeer Project, see Joseph Sonnenfeld, "An Arctic Reindeer Industry: Growth and Decline," *Geographical Review* 49, no. 1 (1959): 77–94; George W. Scotter, "Reindeer Husbandry as a Land Use in North-western Canada," in *Proceedings of the Productivity and Conservation in Northern Circumpolar Lands Conference*, ed. W. A. Fuller and P. G. Kevan, IUCN new ser., 16 (1969): 159–69; and Scotter, "Reindeer Ranching in Canada," 1972. Unpublished memos and annual reports from Reindeer Station post managers between 1952 and 1959 detail many of these "problems" with reindeer, and make gestures toward conducting research on the Alaskan industry's failure. See, for example: NWT, G1979-003-70-1, Laco Hunt, "Some Observations on the Reindeer Industry, 1952"; and NWT, G1979-003-70-1, R. C. Robertson to "Mr. Steele," 27 May 1960. Of course, these documents gave little consideration to the ways in which Inuit residents consciously avoided the program.
- 95 On fishing and biological research, see Piper 192–223; on mining and geology: Piper, 114–39.
- 96 Stephen Bocking has framed northern environments as spaces wherein scholars can work out the integration of environmental history and the history of science. Stephen Bocking, "Science and Spaces in the Northern Environment," *Environmental History* 12, no. 4 (2007): 867–94.
- 97 See Emilie Cameron's chapter, "Climate Anti-Politics: Scale, Locality, and Arctic Climate Change," in this volume.
- 98 Percy Cox, Professor Seward, and Colonel Vanier, "The Reindeer Industry and the Canadian Eskimo: Discussion," *Geographical Journal* 88, no. 1 (1936): 18.