

Fort Conger: A Site of Arctic History in the 21st Century

MARGARET M. BERTULLI,¹ LYLE DICK,² PETER C. DAWSON³ and PANIK LYNN COUSINS⁴

(Received 19 September 2012; accepted in revised form 15 January 2013)

ABSTRACT. Fort Conger, located at Discovery Harbour in Lady Franklin Bay on northern Ellesmere Island, Nunavut, played an intrinsic role in several High Arctic expeditions between 1875 and 1935, particularly around 1900–10 during the height of the Race to the North Pole. Here are found the remains of historic voyages of exploration and discovery related to the 19th century expeditions of G.S. Nares and A.W. Greely, early 20th century expeditions of R.E. Peary, and forays by explorers, travelers, and government and military personnel. In the Peary era, Fort Conger's connection with indigenous people was amplified, as most of the expedition personnel who were based there were Inughuit from Greenland, and the survival strategies of the explorers were largely derived from Inughuit material cultural and environmental expertise. The complex of shelters at Fort Conger symbolizes an evolution from the rigid application of Western knowledge, as represented in the unsuitable prefabricated Greely expedition house designed in the United States, towards the pragmatic adaptation of Aboriginal knowledge represented in the Inughuit-influenced shelters that still stand today. Fort Conger currently faces various threats to its longevity: degradation of wooden structures through climate and weathering, bank erosion, visitation, and inorganic contamination. Its early history and links with Greenlandic Inughuit have suggested that the science of heritage preservation, along with management practices of monitoring, remediation of contamination, and 3D laser scanning, should be applied to maintain the site for future generations.

Key words: Fort Conger, Nares, Greely, Peary, Inughuit, Ellesmere Island, Arctic exploration, inorganic contamination, 3D laser scanning

RÉSUMÉ. Fort Conger, situé au Havre de la découverte, dans la baie Lady Franklin, au nord de l'île d'Ellesmere, au Nunavut, a joué un rôle intrinsèque dans plusieurs expéditions de l'Extrême-Arctique entre 1875 et 1935, surtout dans les années 1900 à 1910, à l'apogée de la course vers le pôle Nord. Nous trouvons ici les vestiges de voyages d'exploration et de découvertes historiques, vestiges qui se rapportent plus précisément aux expéditions de G.S. Nares et d'A.W. Greely au XIX^e siècle, aux expéditions de R.E. Peary au début du XX^e siècle et aux incursions de divers explorateurs, voyageurs, militaires et employés du gouvernement. À l'époque de R.E. Peary, les liens entretenus avec les Autochtones de Fort Conger se sont intensifiés, car une grande partie des membres de l'expédition étaient des Inughuits du Groenland, et les stratégies de survie des explorateurs dépendaient grandement de l'expertise matérielle, culturelle et environnementale des Inughuits. Le complexe d'abris qui se trouve au Fort Conger symbolise une évolution, où l'on a délaissé l'application rigide des connaissances occidentales, comme en atteste la maison préfabriquée inadaptée conçue aux États-Unis pour l'expédition Greely, pour aller vers une adaptation pragmatique des connaissances autochtones, comme l'illustrent les abris d'influence inughuite que l'on aperçoit toujours de nos jours. En ce moment, la longévité de Fort Conger est menacée en raison de la dégradation des structures en bois, dégradation attribuable à l'altération climatique et atmosphérique, à l'érosion des berges, aux visites et à la contamination inorganique. Les débuts de Fort Conger et ses liens avec les Inughuits groenlandais suggèrent qu'il y aurait lieu de mettre en application la science de la conservation du patrimoine, jumelée aux pratiques de gestion de la surveillance, de restauration des matériaux contaminés et de balayage laser 3D, afin d'assurer le maintien du site pour les générations à venir.

Mots clés : Fort Conger, Nares, Greely, Peary, Inughuit, île d'Ellesmere, exploration arctique, contamination inorganique, balayage laser 3D

Traduit pour la revue *Arctic* par Nicole Giguère.

¹ Corresponding author: Parks Canada, 145 McDermot Avenue, Winnipeg, Manitoba R3B 0R9, Canada; present address: 920 Garwood Avenue, Winnipeg, Manitoba R3M 1N6, Canada; margmb@mymts.net

² Lyle Dick History and Heritage, #103, 1055 Harwood Street, Vancouver, British Columbia V6E 1R5, Canada

³ Department of Archaeology, University of Calgary, 2500 University Drive NW, Calgary, Alberta T2N 1N4, Canada

⁴ Nunavut Field Unit, Parks Canada, Box 278, Iqaluit, Nunavut X0A 0H0, Canada

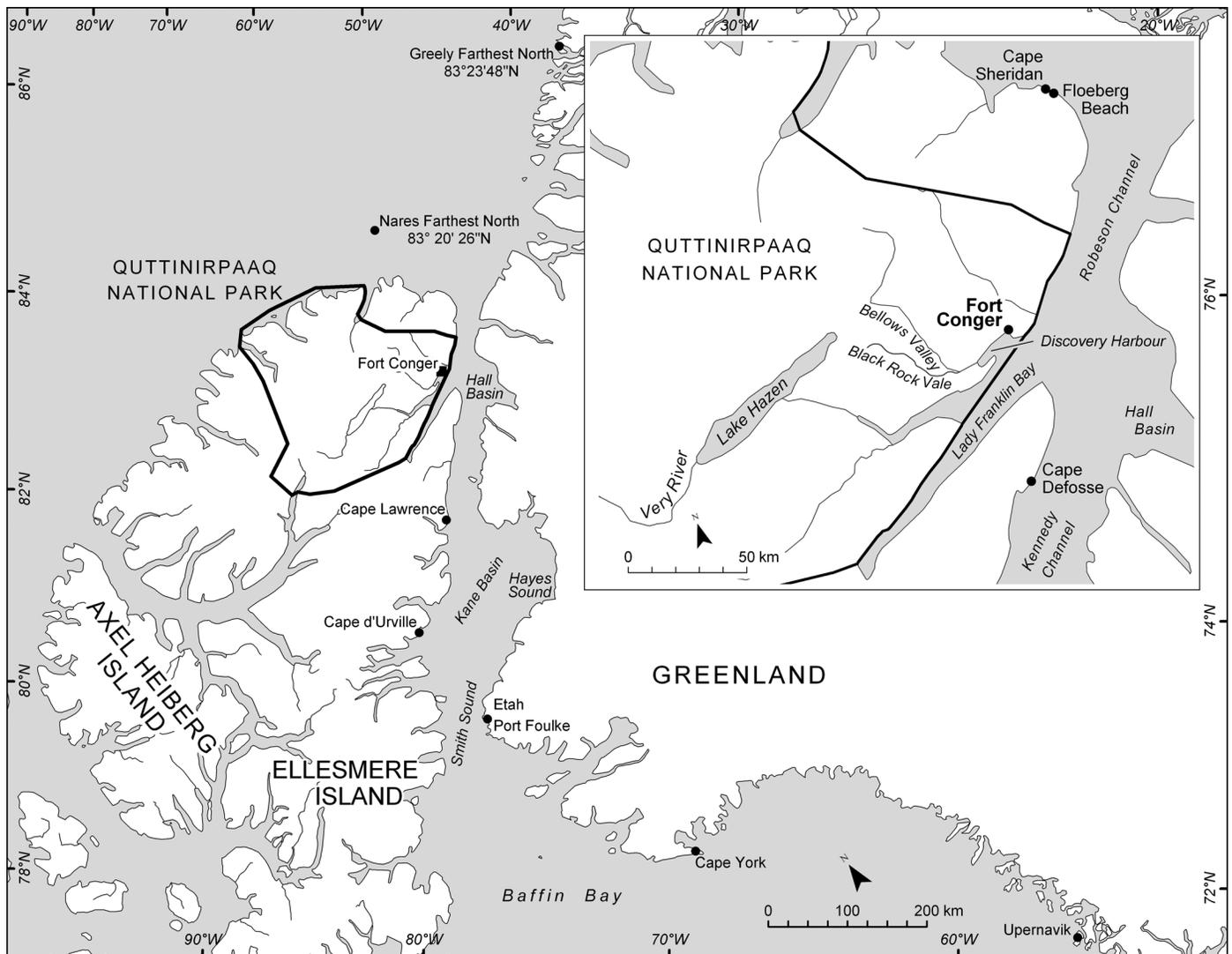


FIG. 1. Map showing location of Fort Conger on northern Ellesmere Island and other place names noted in the text (Credit: T. Naughten and M. Templin).

INTRODUCTION

Few sites of the Arctic exploration era are as rich in history and cultural significance as Fort Conger. Between 1875 and 1935, it played a role in several High Arctic expeditions, particularly at the height of the Race to the North Pole around 1900. Traditionally viewed as a site of European or Euro–North American exploration history, Fort Conger can also appropriately be considered a site of material cultural exchange between Europeans and Greenlandic Inughuit. Moreover, if we look carefully at its surviving physical record of occupation, we begin to see Fort Conger functioning as part of a larger cultural landscape on Ellesmere Island and adjacent landmasses (Fig. 1).

Beyond the story of exploration, science is what largely defines Fort Conger and its environs. It was the science of geography, meteorology, the aurora, and earth's magnetism that first brought European explorers and scientists to Fort Conger. It was eventually Inughuit traditional knowledge that aided their achievements and kept them alive. Finally, it

is the science of heritage stewardship and preservation that may ultimately protect the endangered cultural legacies of Fort Conger.

In recognition of its unique status, Fort Conger has been categorized under Parks Canada policy as Zone 1—Special Preservation, a zoning that places the resource's preservation as the foremost consideration. Nevertheless, several factors may impinge upon its longevity—degradation to the wooden structures, bank erosion, inorganic contamination, and animal and human activity. The site's enduring importance has been recognized in numerous ways. It is a site of territorial historical significance under the Historical Resources Act; Peary's huts, erected in 1900, are Classified Federal Heritage Buildings; and it is one of two sites at which the National Historic Event of the First International Polar Year of 1882–83 is commemorated by the Historic Sites and Monuments Board of Canada.

Spread across a tableland in the protected reach of Discovery Harbour on Ellesmere Island's northeast coast are the fort's evocative remains, which have become a



FIG. 2. Aerial view of Fort Conger's extant remains in 2003. On the top right are the three Peary huts and berm outlining Peary's winter tent with the foundation of the Greely house at centre left (Image: T. Christie).

landmark for Arctic travelers (Fig. 2). The most notable of these include the ruin of the post office cairn, originally constructed with gravel-filled tin cans and topped by a globe made of interlocking barrel hoops (Fig. 3); metal storage tanks; a brick instrument pedestal; and two replacement wooden plaques commemorating the deaths of seamen on the Nares Expedition. Relics of the Greely expedition are numerous and scattered across the entire site—the station house foundation, the louvers of the thermometer observatory, tent outlines and pits, an enclosure or ring made of barrel hoops, barrel water traps in a streambed, a portable forge, and metal bedsteads. The familiar image of Fort Conger is the three huts constructed by Robert Peary's party from the materials of Greely's station house; visible as well is the berm outlining the summer and winter tent quarters, which housed Peary himself.

We consider Fort Conger and its environs to be a cultural landscape—a concept promoted by human geographer Carl O. Sauer, who viewed human culture as an agent shaping specific regions of the earth's surface (Sauer, 1925). The concept evokes the spatial and temporal magnitude of geological processes that wrought the land in its present forms and natural systems; the engagement of indigenous people in co-existing with and within these systems; the spoken and written stories of contact between cultures; the material remnants of indigenous and Euro–North American sojourns in this challenging land; and our current experience of incorporating the tangible past into the present (Olsen, 2010).

This paper explores the entanglement of Western science and Inuit traditional knowledge at Fort Conger through the material remains present at the site. In many ways, the artifacts and structural remains found there constitute a cultural landscape, in which localized knowledge gradually trumps knowledge that was imported from the south by successive expeditions. Perhaps the best expressions of this phenomenon are in the remains of the dwellings found at Fort Conger. Robert Peary dismantled Greely's

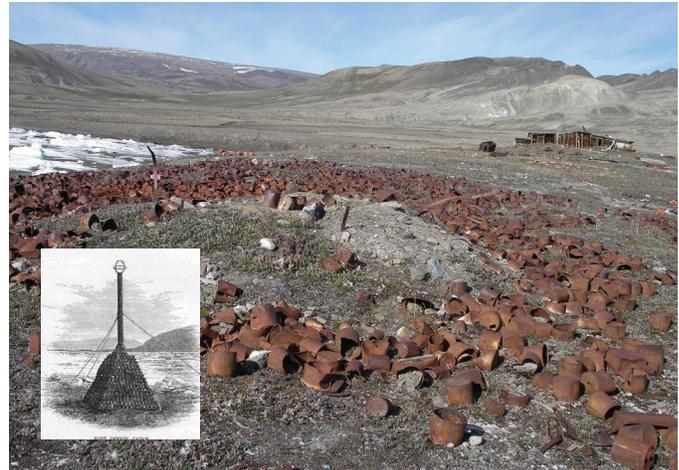


FIG. 3. The post office cairn (Nares, 1878:143), constructed with gravel-filled meat tins by the men of the Nares expedition in 1876 (inset), and as it appeared in 2007. The three Peary huts are in the background at upper right.

earlier prefabricated structure, which was designed in the United States and entirely unsuited to the rigours of an Arctic climate, and used the lumber to construct the Inughuit-influenced shelters. In fact, almost all of the artifacts present at Fort Conger lie somewhere along this continuum, with Western science at one end and Inuit traditional knowledge at the other. Threats to the site now require importing Western science northward again—but this time in the name of heritage preservation rather than Arctic exploration. We explore these ideas through the history of three early expeditions to Fort Conger from the perspectives of their individual achievements, their interactions with the Inughuit, and their adoption of Inughuit traditional methods for living and traveling in the Arctic.

EARLY EXPEDITIONS TO FORT CONGER

British Arctic Expedition, 1875–76

The British Arctic Expedition, led by Captain George Strong Nares, overwintered in northern Ellesmere Island in 1875–76. Clements Markham, editor of *Geographical Magazine* and an influential member of the Royal Geographical Society, had spent a decade urging the government to mount the expedition in order to advance scientific knowledge (Markham, 1921:303). But once the venture fell within the Admiralty's purview, science became a secondary consideration to geographical discovery, and the focus changed to attaining a new "Farthest North" and—if possible—the North Pole. The expedition's orders were to establish winter quarters, conduct scientific observations, and carry out sledging excursions to the highest north latitude possible.

On 29 May 1875, the expedition departed Portsmouth, England. HMS *Alert* and HMS *Discovery* carried complements of 61 and 59 officers, seamen, and marines, respectively. Two Greenlanders joined the expedition: Hans

Hendrik, a seasoned Arctic expedition guide, and hunter and dog driver Johan Frederik Wille. En route to Ellesmere Island, the expedition stopped to purchase sealskin overboots made by West Greenland Inuit women and to secure 55 husky dogs for the expedition's use (Nares, 1878:19–23). The ships passed through Smith Sound in late July and negotiated the narrow passage through Kennedy Channel to arrive off Lady Franklin Bay on Ellesmere Island's northeast coast in late August. Under the command of Captain George Stephenson, HMS *Discovery* remained to winter in the protected harbour that bears its name, while HMS *Alert* under Nares traveled another 150 km to the edge of the Arctic Ocean. Sailing as far north as the pack ice would allow, Nares marked a new "Farthest North" of 82°24' N (Great Britain, Parliament, 1877a:13), before returning to Floeberg Beach at the northeast tip of Ellesmere Island (Cape Sheridan), where he established wintering quarters (Great Britain, Parliament, 1877a). The crew hauled the vessels to safe positions by the shore, where they were anchored and frozen into the ice in autumn. As was the conventional practice during the era of Arctic exploration, the crews of both *Discovery* and *Alert* wintered aboard ship.

The focus of the expedition's activities was the exploration of northern Ellesmere Island and adjacent landmasses by sledging parties. In March, Nares sent out two parties from *Alert* at Floeberg Beach, both with man-hauled sledges. He instructed Lieutenant Pelham Aldrich's party to explore the northern coast of Ellesmere to the west, while Commander A.H. Markham's party was to set out across the pack ice of the Arctic Ocean in search of a new "Farthest North," and "to ascertain the possibility of a more fully equipped expedition reaching the North Pole" (Great Britain, Parliament, 1876:118; Dick, 2001:175). The labour, which proved to be arduous, was made worse when the men began to develop scurvy; the afflicted individuals needed to be carried on the sledges, which increased the weight to be hauled. By 10 May, his party largely incapacitated, Markham concluded that further efforts would place the entire group in peril, and he ordered his men to turn back. They had traveled over the ice pack of the Arctic Ocean more than 800 km to reach a new "Farthest North" at 83°20'26" N, about 640 km from the North Pole (Markham, 1876:319).

For the other sledging parties, whose mission was to explore the coastline, similar difficulties emerged. In addition to the challenge of terrestrial travel on irregular rocky terrain, Nares' sledgers encountered numerous ice pressure ridges that slowed their progress when crossing the mouths of inlets and fiords. Even travel on the coastal ice foot was impeded in places where ice floes were piled, resulting in irregular tangles of jagged ice. Here, the sledgers used pickaxes and shovels to try to hew a path, but mired in drifting snow, they made "snail-like progress" (Markham, 1878:309).

By the summer of 1876, confronting the onset of scurvy in half his men, Nares ordered a premature retreat to the south to Port Foulke, Greenland, and both ships returned to

England a year earlier than expected (Library and Archives Canada, 1876). Owing to the scurvy outbreak and the deaths of four members of his team, Nares faced a Parliamentary enquiry (Great Britain, Parliament, 1877c). He was upbraided by the Committee of Enquiry for failing to provide his men with lime juice, although it was later argued that a greater use of Ellesmere Island's game resources could help to avoid succumbing to scurvy (Kendall, 1951). Certainly, by the mid-1850s, American explorer and physician Elisha Kent Kane (1856:306) espoused the therapeutic effects of a fresh meat diet as both a preventive and a treatment for scurvy. The disease continued to manifest, however, because the Royal Navy used lemon and lime juice interchangeably, not realizing that lime juice was a much less efficient antiscorbutic and that its already low efficiency was often reduced by improper processing and storage practices. The widespread use of lime juice was likely contingent upon the fact that the supply chain of these sour limes from the West Indies was directly under British control (Bown, 2003:212–213).

Science was given greater prominence during the Nares mission than in previous forays. At Discovery Harbour and Floeberg Beach, much of the scientific activity was carried out in the fall and winter of 1875–76 in snow or tent structures near the ships. By the 19th century, geomagnetic research was a major focus of study into the physical character of the earth. Other scientific activities included astronomical, botanical, zoological, and geological observations, as well as oceanographic measurements of tides and spectroscopic observations of solar and auroral phenomena. The Admiralty agreed to fund a scientific manual compiling syntheses of the scientific data acquired by the expedition, and alongside its geographical discoveries, this book constitutes the major legacy of this expedition (Great Britain, Parliament, 1877a).

Lady Franklin Bay Expedition, 1881–84

Only five years after the return of the Nares expedition, the Signal Corps of the United States Army staged its own expedition to the High Arctic and set up wintering quarters in the form of a large station house (Fig. 4) on the same site off Lady Franklin Bay where *Discovery* had wintered in 1875–76. The Signal Corps's mandate to acquire comprehensive weather information led to the conception of this expedition as a means to accumulate Arctic weather data, which were increasingly viewed as important to accurate forecasting (Loomis, 1877; Utley, 1973:22–23). This expedition was one of several sent to North Polar and South sub-polar regions as part of the International Polar Year of 1882–83, an international effort to gather simultaneous scientific data on Arctic and Antarctic regions over the course of a single year (Barr, 1985). The Lady Franklin Bay Expedition (or International Polar Expedition), led by Lieutenant Adolphus Greely, sought specifically to conduct astronomical and polar magnetic observations and also to collect meteorological, oceanographic, zoological, botanical, and



FIG. 4. “Our house at Fort Conger (west side), March, 1882” (Greely, 1888, vol. 1: Frontispiece).

ethnographic data. According to Levere (1993), the most valuable work of the expedition was contained in its astronomical and geophysical observations. The geophysical work included regular recording of tidal data and pendulum observations crucial for measuring local gravity, which varies at different points of the earth. At Fort Conger, Edward Israel’s magnetic data were considered the most thorough of the myriad scientific observations taken by the party between August 1881 and August 1883.

Magnetic observations assumed a particular importance for the Greely party, as they had for the Nares expedition. In November 1882, a marked magnetic disturbance connected to an unusual aurora at this high northern latitude occasioned frequent readings and collection of data. Despite the unsettling failure of their supply vessel to arrive, the Greely party continued making magnetic observations throughout their increasingly troubled tenure at Fort Conger. Other research activities included Greely’s collection of archaeological artifacts and animal and bird specimens intended for transport back to the United States. Owing to the straitened circumstances of the party’s hasty retreat from Fort Conger after a resupply vessel failed to appear for the second consecutive year, many of the intended specimens and artifacts were abandoned at Fort Conger in August 1883.

Interestingly, while leading a predominantly scientific expedition, Greely regarded geographical discovery and in particular, the attainment in 1882 of a new “Farthest North” off the coast of adjacent Greenland at $83^{\circ}23.8' N$ as the expedition’s greatest achievement (Greely, 1886, vol. 1:335). This record-setting sledge excursion, led by Lieutenant James Lockwood, included Sergeant David Brainard and the West Greenland guide Frederick Christiansen, who drove their dog team, enabling the party to negotiate the challenging conditions of the Arctic Ocean pack ice to attain the new record. Brainard also acknowledged the usefulness of maps and sketches of the Greenland coast made by Lieutenant Beaumont of the Nares expedition (Kersting, 1902:75).



FIG. 5. The three Peary huts at Fort Conger in 2010. From left to right: roofless (northwest) Inughuit hut; Dedrick’s hut (northeast); Henson’s hut (south).

Robert Peary, First North Pole Expedition, 1898–1902

Robert Peary’s 1898–1902 expedition is of particular interest for the study of Fort Conger, as it formed his party’s core winter quarters in 1900–01 and continued to function as his base of operations for expeditions in 1905–06 and 1908–09 (Fig. 5). Peary’s 1900 demolition of Greely’s house and subsequent construction of wooden shelters more suited to the environment have given us the Fort Conger that substantially survives today.

The 1898 expedition was also the first on which the explorer relocated whole families of Greenlandic Inughuit to the North, intending that they would establish new settlements to support his efforts to reach the North Pole. The Inughuit or Polar Inuit were the most northerly group of Inuit of the North American Arctic and Greenland. In the 19th century, they inhabited coastal northwest Greenland from Etah on Smith Sound to Cape York. Numbering only about 140 people in total, the Inughuit pursued settlement patterns based on seasonal resource procurement activities and depended on marine mammals for subsistence. Collective capturing of walrus in Smith Sound at the northern extent of the North Water polynya in February and March was an efficacious component of the seasonal round. Distinctive to the Inughuit was the stone winter house: built mainly by the women with sandstone slabs, bones, and turf, it featured coursed stone walls, a cantilevered roof, a cold trap entrance, interior paving with flat stones, and a raised sleeping platform. Snow houses were used mainly for traveling and hunting. At the time of the first documented contact with Europeans (Ross, 1819), the Inughuit had experienced attenuation in their material culture, lacking qayaq technology, fish leisters, and the bow and arrow (Peary, 1898:271; Gilberg, 1984; Dick, 2001:61–73).

Rather than applying Western methods unsuited to the polar environment, Peary relied on the skills and environmental knowledge of Inughuit from northwest Greenland. His plan to “live off the country” largely focused on

Inughuit techniques of travel, shelter, hunting, and clothing, all provided by Aboriginal members of his parties (USNA, 1909).

On his 1898–1902 expedition, Peary first established a main base camp at Etah in northwest Greenland, then overwintered across Smith Sound on Ellesmere’s east coast with his ship *Windward*. His plan was to trans-ship provisions and materials along this coast as far north as Fort Conger, which would be used as a wintering camp. Sledge parties were organized into “trains,” charged with breaking the trail along the coastal ice foot, moving small quantities of supplies, and building snow houses for the sledging parties that would follow. After each party reached one of these temporary camps, it would leave a cache and continue to the next stop. Peary’s intention was to entrench his party and its supplies “at the northern tip of the North Greenland archipelago...with caches behind it at each prominent headland” (Peary, 1899:421). From this staging platform, he and his men would press on in an attempt to become the first group to reach the North Pole (Peary, 1899).

By the winter of 1898–99, Peary was ready to implement his plan to transport supplies during the winter months to Fort Conger, where he would move his entire party by February. Departing Cape D’Urville on 20 December 1898 with surgeon Dr. T.S. Dedrick, his long-time assistant Matthew Henson, and four Inughuit men—Uutaaq, Iggiannuaq, Ukkujaaq, and Sigluk—Peary and his men used several of the shelters constructed earlier along their well-traveled route. Constructed at intervals corresponding to a day’s run by dog team from the nearest camp, these shelters were positioned along the entire route from Cape D’Urville on Kane Basin to Fort Conger. After an extremely arduous journey, Peary’s party arrived at Fort Conger on 6 January 1899. They found the expedition house in generally good condition, despite its chaotic abandonment by Greely’s party more than 15 years earlier. Peary described the scene:

Forcing an entrance and lighting our oil stove, [I] found the interior presenting the utmost confusion. Floor of both officers’ and men’s quarters and kitchen blocked and littered with boxes, packed and empty, pieces of fur, cast-off clothing, rubbish of all descriptions. In the kitchen, partially consumed tins of provisions, tea, coffee, etc., were scattered about, their contents spilled on table and floor. In the men’s quarters dishes remained on the table just as left after lunch or dinner on the day the fort was deserted. Biscuits scattered in every direction, overturned cups, etc., seemed to give indications of a hasty departure. (USNA, 1899)

For the next year and a half, Peary’s party relied on the former Greely house for shelter. However, when his supply vessel *Windward* was prevented from reaching Fort Conger, Peary implemented his emergency plan for sheltering the party in smaller huts built with the lumber of the Greely house and other scavenged pieces of wood. In August 1900, his party constructed the three semisubterranean,

simple-frame structures with six layers of protection, consisting of tar paper, double wooden walls infilled with silt and gravel, and various types of paper, principally star charts and asbestos paper found in the Greely house (Phillips Parmenter et al., 1978a:235–236, 241; Broodhagen et al., 1979). In addition, the party banked the structures with earth and turf, and after the onset of snow in the fall, mounded a final layer of drifted snow around the entire complex (USNA, 1900a). Linking the different structures was a series of excavated tunnels that connected to low-lying entrances into the respective shelters. Peary’s party roofed over these passages with canvas and muskox skins and then with domes constructed of snow blocks (USNA, 1900b).

The settlement pattern of the Fort Conger complex recalls Inuit techniques of both siting and grouping dwellings close to one another and to the shore. Semisubterranean, small, and interconnected dwellings could be adequately heated with a minimal expenditure of precious fuel. As well, shared snow-block entrances, such as the connection between Dedrick’s and Matthew Henson’s shelters, reduced the escape of heat and the intrusion of cold air (USNA, 1901).

Where the Fort Conger complex differed from Inuit practice was in its hierarchical organization of space. Peary’s wintering shelter was connected directly to that of Dr. Thomas Dedrick, the expedition’s second-in-command, who was charged with conveying Peary’s orders to both Matthew Henson and the Inughuit members of the party, housed in turn in huts linked to Dedrick’s unit (Dick, 1991). These hierarchical relations did not continue with subsequent expeditions seeking shelter at Fort Conger. In his account of his 1921 side trip to Fort Conger, Lauge Koch commented that his party was occupying the same shelter in which his Inughuit guides sang drum songs long into the night (Koch, 1926).

Nevertheless, beyond its status as an artifact of Peary’s North Pole expeditions, Fort Conger also displays the environmental knowledge and pragmatic adaptation that have enabled Inuit and their predecessors to occupy the High Arctic. One of the most striking differences between Peary’s approach and those of his predecessors was his intentional reliance on the Inughuit, with whom he had become well acquainted during several earlier expeditions to northern Greenland (Fig. 6). Other expeditions had employed individual Greenlanders as hunters and sledge drivers, but they were given minimal roles in these operations and were separated from their families. In the course of earlier wintering expeditions in Greenland’s Thule district, Peary discerned the importance of Inughuit family dynamics to the survival and effective functioning of his parties and further, that the well-made, warm, and waterproof skin clothing and footwear sewn by Inughuit women was vital to existence in the Arctic climate (Peary, 1917b:160–178; Lemoine and Darwent, in press). So determined was Peary to attain the North Pole that the effects of what may now be viewed as patriarchal and hierarchical



FIG. 6. “Photo of Inughuit with tents and hunting weapons at Fort Conger, with barrels and boxes in foreground, ca. 1906” (Peary, R.E. Family Collection, 1908–09).

practices and interactions with the Inughuit led to many unfortunate consequences. Reactions to severe psychological stress on the part of the Inughuit were characterized as pathological (*pibloktoq*), but in fact derived largely from such imposed practices as long separations of family members and compatriots, strenuous and perilous sledging trips, sexual exploitation and abuse of women, and compulsory work routines, noise curfews, and rationing (Dick, 2002).

LATER EXPEDITIONS TO FORT CONGER

Although the 19th- and early 20th-century expeditions to Fort Conger, particularly Peary’s sojourns, are pivotal in establishing its historical and international significance, expeditions later in the 20th century cemented its allure.

In May 1915, geologist W.E. Ekblaw of MacMillan’s Crocker Land Expedition of 1913–18 and Inughuit companions Esayoo and E-took-a-shoo overnighted at Fort Conger and used the “Army Range No. 1” stove, which was then still in the remains of Greely’s kitchen. The stove is now inverted near the northwest corner of the Greely foundation (Ekblaw, 1925).

Commander Godfred Hansen, Royal Danish Navy, traveled to northern Ellesmere Island on the Third Thule Expedition to lay supply depots in support of Norwegian explorer Roald Amundsen’s unsuccessful North Polar drift in *Maud*. Fort Conger was the location for one of these depots, and in April 1920, Hansen deposited “about 300 pounds of food, 3 to 4 gallons of kerosene, a quantity of ammunition and a report for Amundsen” (Hattersley-Smith, 1964:112). The depot, used by later parties, is now referred to as “Amundsen’s Cache” and is thought to have been left in Matthew Henson’s hut, the most southerly of the three huts.

Geologist and explorer Lauge Koch (1927), on the Danish Bicentenary Jubilee Expedition, stayed at Fort Conger from 5 to 19 April in 1921. Several of the Inughuit on this expedition had previously lodged at Fort Conger, and

one had participated in the construction of the three Peary huts. Koch used the stove in the northeast hut and found the northwest hut to be in a very poor state. At that time, only a few of the kitchen walls of Greely’s station house and the Army Range were visible, along with the inscribed boards commemorating the deaths in June 1876 of J.J. Hand and C.W. Paul of the Nares expedition (Hattersley-Smith, 1964).

The final expedition to use Fort Conger was the 1934–35 Oxford University Ellesmere Land Expedition, organized by Edward Shackleton (1937). In April 1935, on an outward journey to Lake Hazen, RCMP Sergeant Henry Stallworthy, A.W. Moore, and Inughuit Nukappianguaq and Inuutiq (Inuuterssuaq) occupied the Peary huts. By now, the northwest hut was decrepit and the memorial boards were not visible above the snow, probably having fallen down. The party used coal, 60 pounds of pemmican, tinned food, and “half-mouldy” cigars from Fort Conger and vicinity. On their return journey from Lake Hazen, during a two-day stop at Fort Conger from 8 to 10 May 1935, they used all of the edible remains from Amundsen’s cache for dog food (Hattersley-Smith, 1964:113).

A senior icebreaker captain of the Canadian Coast Guard, A.C. Chouinard, visited Fort Conger by helicopter in 1948 while on a joint Canadian-American post-war mission to resupply weather stations in Arctic Canada (Christie, 1986). Chouinard’s photographs and the sketch map he drew of Fort Conger are the first descriptive work on the site, although some of his feature attributions are incorrect (Hattersley-Smith, 1964). At this time, Captain Chouinard “picked up a can of potatoes left by Nares or Perry (sic) and presented it to the [Deputy] Minister [of Transport, J.C. Lessard] as a photographer took their picture” (Kikkert, 2009:156; Appleton, 2011). This can of potatoes was eventually given to J. Edward Devine, a senior government official, whose family now possesses it, but its association with either of these early expeditions has not yet been ascertained (P. Devine, pers. comm. 2012). Additionally, Kikkert (2009:170) refers to Lt.-Colonel Charles Hubbard of the USAAF “retrieving some old meteorological instruments from Fort Conger” in 1950 with an Archaeological Sites Ordinance permit. Also at that time, the helicopter pilot left a record with signatures at Fort Conger, a long-standing tradition at remote locations around the globe. In the following decades, visitation to Fort Conger increased as renewed scientific research interests coincided with improved transportation methods (Table 1).

Geologist Hattersley-Smith (1964:114–115) presents a haunting description of Fort Conger on his visit of 5 June 1962:

Peary’s and Henson’s houses were more or less intact, but the doorways were open, and there was snow inside. Both houses still had the wall-papering put on by Peary’s Eskimos, and the paper included unused meteorological record sheets and copies of the original orders to the expedition, with the signature of “W. B. Hazen” (Chief Signal Officer, U.S.A.) clearly

TABLE 1. Visitation at Fort Conger, Discovery Harbour, Lady Franklin Bay. This list, though not exhaustive, indicates that Fort Conger has attracted High Arctic travelers for well over a century. The list excludes monitoring visits by Parks Canada staff, Greenlandic hunters, military excursions from Canadian Forces Station Alert, and small groups of tourists, but it does include visits when scientific or site recording was conducted or major impacts occurred.

Expedition / Project / Leader	Personnel referenced	Year	Reference
British Arctic Expedition (Captain George Strong Nares)	Captain George Stephenson, HMS <i>Discovery</i>	1875–76	Nares, 1878
Lady Franklin Bay Expedition (Lieutenant Adolphus Greely)	Complement of 25 men	1881–84	Greely, 1886
First North Pole Expedition	Robert Peary	1898–1902	Peary, 1903
Second North Pole Expedition	Robert Peary	1905–06	Peary, 1907
Third North Pole Expedition	Robert Peary	1908–09	Peary, 1910
Third North Pole Expedition (Robert Peary)	D.B. MacMillan, Koodlookto, J. Barnes	1909	MacMillan, 2008
Crocker Land Expedition of 1913–18 (Donald B. MacMillan)	W.E. Ekblaw, Inughuit Esayoo and E-took-a-shoo	1915	Ekblaw, 1925
Third Thule Expedition	Commander Godfred Hansen, Royal Danish Navy	1920	Hansen, 1921
Danish Bicentenary Jubilee Expedition	Danish geologist and explorer Lauge Koch	1921	Koch, 1927; Hattersley-Smith, 1964;
Oxford University Ellesmere Land Expedition (Edward Shackleton)	RCMP Sergeant Henry Stallworthy, A.W. Moore, Inughuit Nukappianguaq and Inuutiq (Inuutersuaq)	1935	Shackleton, 1937; Hattersley-Smith, 1964
Arctic Weather Stations Resupply Mission; Icebreakers USS <i>Edisto</i> and USCGC <i>Eastwind</i>	Captain G.J. Dufek (USN) and Captain A.C. Chouinard (RCNR) landed in helicopter	1948	Hattersley-Smith, 1964; Kikkert, 2009; Christie, 1986
Returning from mission to establish Alert Weather Station	J.W. Burton (Senior Canadian Observer) and J.G. Dwyer (Senior US Weather Bureau Observer)	1950	Hattersley-Smith, 1964; Kikkert, 2009
Testing tundra tires on fixed wing aircraft	Aviator W.W. Phipps and D. Muir (National Film Board)	1956	Hattersley-Smith, 1964, 1997
Group from the Lake Hazen camp of the Defence Research Board	Flight Lieutenant M.W. Utas; F.S. Grant conducted gravity measurements	1958	Hattersley-Smith, 1964
RCMP patrol	Supt. W.G. Fraser	1962	Hattersley-Smith, 1964
Topographical survey	P.C. Atkinson, G. Hattersley-Smith	1962	Hattersley-Smith, 1964
Geological Survey of Canada	R.L. Christie, M. Haycock, J. Cline (pilot)	1965	M. Haycock, 1982; K. Haycock, 2007
Geological Survey of Canada, glacial geology of Archer Fiord	J. England, R. Bradley, D. Thompson	1971 and 1972	England, 1973
	Artist M. Haycock and G. Hobson, then Director of Polar Continental Shelf Project (PCSP)	1972	G. Hobson, pers. comm. 2013
	Artist and geologist M. Haycock	1975	K. Haycock, 2007
Archaeological baseline survey of Ellesmere Island National Park Reserve	P. Sutherland	1977	P. Sutherland, pers. comm. 2012
Arctic Historical Archaeology Project	C. Phillips and field crew	1977	Phillips Parmenter et al., 1978a
Arctic Historical Archaeology Project	C. Phillips and field crew	1978	Phillips and Burnip, 1981
Arctic Historical Archaeology Project	C. Phillips and field crew; extant recording of Peary's huts	1979	Broodhagen et al., 1979; Phillips Parmenter, 1980b
Geomagnetic Laboratory, NRCan (then Energy, Mines & Resources Canada)	L.R. Newitt and E. Dawson installed a geomagnetic survey marker and made magnetic observations	1982	Newitt and Dawson, 1984
	George Hobson, then Director of PCSP and Dr. Raymond A. Price, then Assistant Deputy Minister, Department of Energy, Mines and Resources	1984	George Hobson, pers. comm. 2013
Parks Canada	Lyle Dick, Tabitha Mullen and Ellen Lee set up a photo-monitoring program	1989	Parks Canada, 1990
Inuit Communications Systems Ltd., Parks Canada	Rene Wissink, <i>Working Together to Manage the Most Northern Lands in Nunavut</i> (video); Barrie McLean, Producer	ca. 1994	
Parks Canada	Damage by Twin Otter landing on site rather than airstrip	1994	B. Troke, pers. comm. 2007
	Adventurer and author Jerry Kobalenko	1995, 1996, 1998, 2002	Kobalenko, 2002; pers. comm. 2012
Good Earth Productions	<i>Fort Conger—Ellesmere Island, Nunavut</i> , Episode 13, History Lands Series (video)	ca. 1997	Good Earth Productions, 1998; I. Macjiwsky, Cinematographer and Executive Producer, pers. comm. 2012
Department of Plant Pathology, University of Minnesota	R.A. Blanchette and field crew	2001 and 2002	Blanchette et al., 2008
Public Works and Government Services, Real Property Services	Detailed photographic recording of Peary's huts	2002	PWGSC, 2002
Jerry Kobalenko	<i>Horizontal Everest</i> (film); Produced by Summerhill Entertainment; Series: Canadian Geographic Presents	2005	Kobalenko, pers. comm. 2013

TABLE 1. Visitation at Fort Conger, Discovery Harbour, Lady Franklin Bay. This list, though not exhaustive, indicates that Fort Conger has attracted High Arctic travelers for well over a century. The list excludes monitoring visits by Parks Canada staff, Greenlandic hunters, military excursions from Canadian Forces Station Alert, and small groups of tourists, but it does include visits when scientific or site recording was conducted or major impacts occurred – *continued*:

Expedition / Project / Leader	Personnel referenced	Year	Reference
Cocked Hat Ventures, LLC	<i>Abandoned in the Arctic</i> (film); G.E. Clark and film crew including Greely descendant, J. Shed	2004	Cocked Hat Ventures, LLC, 2004
Contaminant sampling	Environmental Sciences Group, Royal Military College of Canada	2004, 2005, 2006	Laing et al., 2008
Quark Expeditions	<i>Kapitan Khlebnikov</i> (cruise ship)	2006, 2008, 2010	A. Stubbing, pers. comm. 2012
Parks Canada, patrol/survey of historic sites in area	Tyler Harbidge, Douglas Stern, Alex Stubbing	2007	Bertulli, 2007
Parks Canada, cultural resource management	M. Bertulli, L. Dueck	2007	Bertulli, 2007
Contaminant sampling and arsenic remediation	Environmental Sciences Group, Royal Military College of Canada	2007	Laing et al., 2008
Cory Trépanier, artist	<i>Into the Arctic #65</i>	2009	Trépanier, ca. 2009
Blue Ant Media, Toronto, Ontario	<i>A Park for All Seasons</i> (video); Producer: Craig Colby	2009	http://oasishd.ca/
Cultural resource management and 3D laser scanning; Parks Canada, University of Calgary, Sarpoint Engineering	M. Bertulli, P. Dawson, C. Tucker, L. Dick, L. Cousins, J. Attagutsiak	2010	Bertulli, 2010; Dawson et al., 2010, 2013

discernible on one page. Of the Eskimos' house, the roof and parts of the wall were missing. A large heap of rusty cans of food from 1875 or 1881 lay outside, and one of the cans was found to contain asparagus, apparently in good condition; there were also cans of condensed milk, probably of later vintage. The ground perimeter of Greely's original house was still to be seen, and near the centre there remained the flooring on which the Army range had stood. Scattered around were noticed rusty bedsteads, the remains of a clothes mangle, part of a pair of kitchen scales, a pepper pot, a steel frying-pan, saucepans, a heavy pestle, a wooden coffee-grinder, pickax and sledge-hammer heads, a ski-tip, the sawn-off ends of tent poles, an Eskimo ulu, a chain and toggle, a steel file, and empty medicine bottles and broken crockery. There were also many barrel hoops, including some arranged as a fence around what may have been a miniature garden. ...

Adventures still occur at Fort Conger, as evidenced by the landing of a fixed wing aircraft directly on the site in 1994; it knocked over a brick instrument pier attributed to the Greely expedition and smashed a geomagnetic survey marker dating to 1982 (PWGSC, 2002:11).

WESTERN SCIENCE AND LOGISTICS AT FORT CONGER

Western science, generally associated with knowledge practices developed in Europe or countries settled by Europeans, emerged during the scientific revolution of recent centuries. It has been one of the main ways of trying to know the world through the application of universal

knowledge and theories. We associate it with careful empirical observations to test natural phenomena. Western science represents wide-ranging, coordinated, multinational efforts to develop knowledge, which is then used to assert greater control over the natural environment. The knowledge derived from these approaches is often used to form law-like generalizations about natural phenomena, which are then applied outside of the specific environments from which they were originally derived.

The history of Fort Conger, especially the occupations of this site by the Nares and Greely expeditions, well illustrates the application of Western models to the study of the High Arctic environment. Basing their work on universal principles of collecting empirical data and measuring and testing those data to advance knowledge, the exploring parties made important contributions to the scientific knowledge of the environment.

While the study of geography, meteorology, the aurora, and earth's magnetism initially brought Western explorers and scientists to Fort Conger during the 19th century, it was Inughuit traditional knowledge that later advanced Peary's cause and kept his parties alive. Initially, Western scientific principles were used to determine appropriate modes of travel, shelter, and clothing for life in the Arctic. Not surprisingly, this method frequently resulted in unnecessary hardship. In contrast to Inughuit or Inuit use of sled dogs, most European sledge parties of the early contact period relied on human propulsion. The British Arctic Expedition of 1875–76 used man-hauled sledges made of oak and shod with steel runners, weighing 65 kg unloaded. These sledges proved both heavy and unwieldy. When loaded with trail gear, the sledges weighed 500 kg or more, and frozen tents and sleeping bags, which had to be packed before they had dried, further increased their weight. To

add to their difficulties, the men had inadequate footwear, as no snowshoes had been issued (Hattersley-Smith, 1976). Encountering deep stretches of wet snow, the hapless sledgers sank into it knee-deep or up to their waists (Markham, 1878:343–344). The Greely expedition also heavily relied on man-hauled sledging excursions, and its sledgers experienced difficulties similar to those of their predecessors. Both the Nares and Greely expeditions included Greenlanders, along with their sleds and dog teams, but they made only limited use of Aboriginal techniques while in the Arctic.

The problems inherent in imposing 19th-century European material culture on High Arctic life were apparent in the crucial matter of shelter. As late as the 1880s the explorers were continuing to employ Eurocentric approaches to human habitation, sometimes with disastrous consequences. Euro-North American inexperience in polar shelter was well represented by the Nares and Greely expeditions to northern Ellesmere Island. Ironically, expeditions staged in part to advance the scientific knowledge of polar regions showed little awareness of the applied science of High Arctic survival. The approach of the British Arctic Expedition was perhaps the most outmoded, as it conformed to practices whose suitability was already in doubt during the mid-19th century. Specifically, the explorers wintered aboard ship at both Discovery Harbour and Floeberg Beach. At both sites, the crews hauled the vessels to safe positions by the shore where they were anchored and frozen into the ice in autumn. They undertook a number of steps to insulate the ships by mounding snow up to the channels, or holes in the gunwales for the rigging (Markham, 1878:180), and by spreading snow over the top deck. In an attempt to insulate the hatch entrances from the intrusion of cold air, the crews constructed snow block porches over the hatches (Moss, 1878). Despite the porches, the hatch doors defied the axiom of gravity by which warm air rises and cold air falls. This was the fundamental principle of cold-weather Inughuit architecture in the contact period, but in the case of the British ships, a cascade of freezing air accompanied each entrance into or exit from the hold. To make matters worse, the snow porches, receiving the heated air from below, melted frequently, necessitating recurrent repairs (Markham, 1878:180–181). Below decks, problems developed with excessive condensation, poor ventilation, and oscillations in temperature. The ship quarters were not conducive to the development of proper up-takes and down-takes of air, while moisture, forming continually on the beams, produced a constant drip. Moreover, *Discovery's* coal-burning stoves were unable to maintain a consistent interior temperature: wide fluctuations between 6°C and 20°C were reported (Great Britain, Parliament, 1877b). In a subsequent account on the health of the party, expedition surgeon Dr. Thomas Colan cited both the dampness and the extreme changes of temperature as predisposing factors to the outbreak of scurvy suffered by the men.

Only six years later, the U.S. Army's Lady Franklin Bay Expedition established a base camp on land, as the expedition ship was not retained for the winter. The *Proteus* departed after unloading men, supplies, and pre-cut lengths of lumber for the prefabricated expedition house, which was patterned after trading houses of the Hudson's Bay Company in northern Canada. Assembled within a few days, the house measured 18 m long by 5.5 m wide, and featured 3 m high ceilings and a steeply pitched gable roof with intervening loft space used for storage. Its double walls consisted of exterior vertical boards, battened with tarpaper and separated by an airspace from the tongued and grooved inner walls, which were also lined with tar paper (Greely, 1886, vol. 1:82–91).

The suitability of Greely's house for a High Arctic environment was questionable, as its considerable size and extent of exposed surfaces imposed heavy energy demands. For example, during September 1881, the first complete month of occupancy, the house stoves consumed five tons of coal, "nearly double the proper amount," in Greely's opinion (1886, vol. 1:121). The heavy energy demands obliged Greely to send men to the coal seam in the vicinity to mine and haul coal almost every day. More significant, perhaps, were the effects of heavy burning of coal on the air quality of the expedition house (USNA, 1883). The men were exposed to coal fumes continuously throughout much of the year, a probable contributing factor to the respiratory illness experienced by the party during the first year at the station.

INUIT ENVIRONMENTAL KNOWLEDGE

Like Western science, Inuit environmental knowledge is also empirically based, that is, grounded in the careful observation of natural phenomena, and it too seeks to understand the environment. It is local in origin and has been developed to enable a more effective adaptation to local and regional environments, which could comprise hundreds of square kilometers over land and sea (Freeman, 1976). Knowledge required for the effective exploitation of this range was complex, necessitating the thorough understanding and application of multifaceted technical and environmental information of aquatic and terrestrial ecosystems, in various seasons and during periods of light and dark (Freeman, 1984). Unlike Western science as practiced during the age of Arctic exploration, Inuit environmental knowledge is typically not used to develop generalizations that can be widely applied throughout the natural world. (In contrast, however, those scientists participating in the first IPY believed that Arctic and Antarctic meteorology was key to understanding how similar processes worked in other regions of the world.) Inuit environmental knowledge is used continually in day-to-day problem solving (Dick, 2001:481–491). The knowledge is immediately relevant to the situation and applied on the spot. For both types of science to work, there is always a need to localize knowledge,

that is, to test it out at the places and in the environmental conditions in which it is acquired.

Many examples illustrate how the features of Inughuit knowledge, as defined above, are remarkable adaptations to life in the High Arctic and represent a bank of specific, deep observations collected and held for each visited locale. For example, the sparse populations and perpetual movement of animal resources in the High Arctic demanded high levels of mobility among Inughuit populations. The people needed to be seasonally on the move, adjusting their areas of resource use according to the movements of game species. Remaining highly mobile entailed the transport of all materials necessary to sustain life—skins for tents and bedding and clothing; metal and wood for hunting, cutting, and scraping tools; and sufficient provisions to sustain the group in the intervals between the successful procurement of game. It was a pragmatic and logical adaptation to an ecosystem in which animal species were both broadly dispersed and inclined to roam over vast expanses (Holtved, 1967; Gilberg, 1984).

To effectively exploit the small numbers of animals that were available, inhabitants also needed to avoid too much specialization. Cultures of the High Arctic secured game from a range of both marine and terrestrial species. Such diversification required the development of a variety of hunting tools and a repertoire of techniques to ensure a successful response to the region's resource base.

As hunting peoples, indigenous occupants needed to adapt to the region's natural ecology and to adjust to its frequent and unpredictable privations. Viable human occupation of this region required strategies of resource use closely attuned to the seasonal cycle, feeding characteristics, and migration patterns of the major game animals. Other essential adaptations included the development of flexible forms of social organization structured around hunting, high levels of mobility, and the limiting of parties to small bands capable of developing sustainable strategies of natural resource use. As well, the material culture was largely derived from products of the animals hunted: clothing and bedding from skins of muskox, fox, seals, and polar bear; and projectile points and sledge runners from whalebone.

The occupation of Fort Conger and associated sites by Peary's party around 1900 represented the application of Inughuit knowledge to most aspects of travel, subsistence, procurement, and shelter in the High Arctic. The practice of building temporary camps at hunting sites or along routes between areas of resource procurement owed much to Inughuit precedent. For centuries, Inughuit and their ancestors had developed strategies, including the placement of summer camps and ancillary settlements, that enabled them to move across the land seasonally to various sites of resource procurement, such as polynyas, which have been shown to host concentrations of game sources (Stirling, 1980) and to which indigenous people were attracted (Schledermann, 1980). These were viable strategies of survival in a region where periodic absences of food animals resulted in debilitating hunger or famine.

An example of Inughuit mobile approaches to animal procurement was a hunting trip to the interior of northern Ellesmere Island staged by Peary's party in the fall of 1900, documented in the explorer's diary account of this foray in the Peary Family Collection at the U.S. National Archives. Drawing on the knowledge of his Inughuit companions, Peary planned these trips to exploit as many hunting areas and different kinds of game animals and fish as could be feasibly included in the itinerary. On 16 September, he left Fort Conger with Matthew Henson and four male Inughuit hunters—Angulluk, Sissuk, Utaaq, and Palloq. They took four sledges, 20 dogs, and five pups. Scouring the interior from the valleys of the Bellows and Black Rock Vale in the east to the southern shores of Lake Hazen and the Very River Valley in the west, the party killed 92 muskoxen before returning to Fort Conger on 22 October. Most of these animals were taken in a period of less than three weeks (Peary, 1917a).

Drawing on skills of keen observation of tracks and other traces of animal movements, Inughuit serving on these expeditions hunted by moonlight even during the four months of winter darkness and severe temperatures. While based at Fort Conger in 1900–01, Inughuit members of the party, accompanied by Dr. T.S. Dedrick and Matthew Henson, spent much of that winter in the interior of northern Ellesmere engaged in hunting and stockpiling meat. An unfortunate impact of Peary's unflinching drive to attain the North Pole was his practice of killing and caching as many animals as possible, which resulted in the near decimation of northern Ellesmere's Peary caribou population. On Peary's second attempt in 1905–06, his hunting parties slew 502 muskoxen and 84 caribou and his overall harvest of caribou from northern Ellesmere amounted to 233 animals (Manseau et al., 2005; Petersen et al., 2010). Although the muskox population has recovered, Peary caribou in this area are scarce to the present day (Manseau et al., 2005).

For shelter on hunting trips, Inughuit used both quasi-permanent stone shelters and more temporary snow houses on the trail. The stone houses were constructed as base camps and also served as collection depots for meat moved from various caches for trans-shipment to Fort Conger. During Peary's last two North Pole expeditions, when Fort Conger continued to serve as an ancillary base camp for parties based at Cape Sheridan on the northeastern coast, the hunting parties relied on three temporary settlements ranged around the perimeter of Lake Hazen. These settlements served as a base of operations for hunting muskoxen and other animals throughout the fall and early winter of 1905–06 and 1908–09.

BEGINNINGS OF SYSTEMATIC SITE RECORDING

The indigenous cultural landscape at Fort Conger is, in actual fact, a composite of Inughuit knowledge and 19th- and 20th-century Western scientific practices. Now, a third category of science—the science of heritage stewardship

and preservation—is necessary to protect these earlier cultural legacies from the looming threats of destruction through erosion, inorganic contamination, and human activities. Effectively managing this important site has become an area of concern. Geologist R.L. Christie (1986) opined with prescience that preserving a site as historically significant as Fort Conger carried the conflicting risks of overprotecting it or allowing natural processes to take their course. In 1965, he mapped the site, and retired mineralogist and artist Maurice Haycock created several paintings of Peary's huts (Haycock, 2007). One of these paintings now hangs near the Speaker's offices of the Legislative Assembly in Iqaluit, Nunavut.

Parks Canada became involved in recording and conserving significant sites in the history of Arctic exploration in the late 1970s, at the urging of advocates Dr. Maurice Haycock, Dr. George Hobson, then of the Polar Continental Shelf Project, and Douglas Heyland, then of the Quebec Wildlife Service. Concern about the unauthorized removal of artifacts from historic sites and the consequent loss of information prompted the formation of the Arctic Salvage Project, later known variously as the (High) Arctic Historical Archaeology Project or the Historical Archaeology Arctic Project, which functioned from 1976 to 1982. This ambitious undertaking, partially funded by Parks Canada, aimed to document sites related to 19th- and early 20th-century exploration of the Canadian Arctic. Under its auspices, Caroline Phillips conducted work at Fort Conger in the summers from 1977 to 1979 and documented the remains of 42 features. The results of this work furnished the baseline recording for Fort Conger's cultural features (Phillips Parmenter et al., 1978a, b; Phillips Parmenter, 1980a, b; Phillips Parmenter and Burnip, 1980; Phillips and Burnip, 1981). Over the years, there has been some structural change to the Peary huts and many artifacts have fallen prey to unauthorized collectors, but those recovered and documented are now stored at the Prince of Wales Northern Heritage Centre in Yellowknife and by Parks Canada in Winnipeg. Besides an impressive variety of tin and wooden containers, rope and textile fragments, barrel hoops and staves, artifacts related to the 526 daily scientific observations conducted by the Greely party include components of thermometers, a barometer, a chronograph, and a psychrometer.

Park Establishment and Heritage Designations

Following an initial expression of interest in creating a national park in the northernmost reaches of Canada in 1978, territorial and federal government backing in 1982, and formal support from the nearest communities of Resolute Bay and Grise Fiord in 1984, the Ellesmere Island National Park Reserve came into being in 1988 (Parks Canada, 1988). Quttinirpaaq ('Top of the World') was established under the National Parks Act in 2001 after the negotiation of the Inuit Impact and Benefit Agreement (IIBA) required by the Nunavut Land Claim Agreement

(Parks Canada, 2009). A six-member joint advisory committee co-operatively manages the park, with three members appointed by the Qikiqtani Inuit Association and three by the Minister responsible for national parks (GOC and QIA, 1999: 5.1.4). This structure has proven to be particularly effective in working within cross-cultural complexities and strengthening Canadian Inuit participation in managing and operating national parks in Nunavut. A major commitment under the IIBA is that Parks Canada will protect and promote archaeological and cultural sites and document threatened sites (GOC and QIA, 1999: Article 4).

Management Concerns

Monitoring and recording of structural remains over the years have shown that major changes occurred at Fort Conger in the mid and latter parts of the 20th century. Significant movement and loss of surface artifacts and faunal materials have been attributed to unaccompanied visitation to the site. Recent comparisons to the extant recording of the Peary huts (Broodhagen et al., 1979), done in 1979, show incremental degradation. Further, gradual thinning of the historic woods of the Peary huts has occurred through wind ablation, salt or chemical damage, defibrillation, and *Cadophora* fungi, whose active presence in moist conditions and above-freezing temperatures produces soft rot (Blanchette et al., 2008).

A monitoring protocol based on the synchronic repetition of photographic views of the Peary huts and surface artifacts was implemented in 1990 and elaborated in 2010 to comprise views of each wall of the Peary huts. The protocol consists of photographically replicating each view in multiple years and comparing it to previous views to document visible changes over time. Conducted several times between 1990 and 2010, comparisons have not identified further significant structural problems with the Peary huts, although they have sustained damage from polar bears and the only remaining ceramic chimney on the northeast hut fell between the summers of 2007 and 2008. In 2010, wall boards that had detached because of weathering or polar bear activity were reattached with metal screws to maintain the structural integrity of the huts, and similar minor repairs have been made over the years.

Monitoring the bank erosion of the tableland on which Fort Conger sits is critical to applying appropriate and timely intervention, if necessary. A bank monitoring protocol, based on the site's original north-south grid line, measures the distance from the major cultural resources of the Peary huts, the Greely house foundation, and the Nares post office cairn to the first major break in the bank edge. The distance from the northwest corner of the Greely House to the eroding bank was 11.7 m in 2007 and 9.4 m in 2010; the post office cairn sits only a meter from the eroding bank edge.

Ironically, remnants of the great age of Arctic exploration, in the form of inorganic chemicals requiring

remediation, present a severe hazard to Fort Conger and its cultural resources. As the agency responsible for addressing contamination problems on lands within its jurisdiction, Parks Canada received funds under the Federal Contaminated Sites Action Plan (FCSAP) of Environment Canada to identify, assess, and partially remediate contaminated areas at Fort Conger. Legislation (Environmental Protection Act, Fisheries Act, and Arctic Waters Pollution Prevention Act) and policy (Treasury Board Policy on Management of Real Property) define acceptable practice. Sampling of soils across the site by the Environmental Sciences Group (ESG) of the Royal Military College, Queen's University, Kingston, Ontario, have perceived higher-than-background levels of arsenic, copper, lead, and zinc, and also cadmium, chromium, nickel, and mercury (ESG, 2009). The highest levels of these contaminants occur in the area of the major cultural resources. It is sobering to realize that such elevated contaminant levels, stemming directly from the historical connections that engendered Fort Conger, carry with them the potential to harm the very resource whose historical connections we observe today. It was likely that the Greely expedition transported these chemicals to the site for the exigencies of its scientific work: arsenic trioxide to preserve faunal specimens for natural history collections; mercury in weather recording instruments; and copper and zinc in batteries. Tar paper used in building construction contains polycyclic aromatic hydrocarbons (PAHs). The ESG assessed the potential for these elements to be taken up into the terrestrial food chain or transferred to the marine environment via a natural drainage ditch and the bank slumping into Discovery Harbour. It was found that plants growing in contaminated soils containing these inorganic elements pose a risk to collared lemmings, but not to predators higher in the food chain, such as Arctic foxes and birds. The ESG (2009) also judged it likely that contaminants would eventually make their way into the sea via the eroding bank, a technical violation of the Fisheries Act (36(3); GOC, 1985), which proscribes the discharge of harmful substances into water bodies "frequented by fish." For these reasons, Fort Conger has been categorized as a Class 1 Site, High Priority for Action on the National Classification System for Contaminated Sites (CCME, 2008). The situation thus requires continued research and monitoring in the form of risk management and possible remediation.

The 2007 removal of a real and immediate threat—two exposed piles of arsenic trioxide (Fig. 7) and surrounding soil—has mitigated the environmental concern to some degree and illustrates Parks Canada's risk management strategy to balance and preserve both the cultural and ecological integrity of this historic landmark. An area in the canvas lean-to at the north end of the Greely foundation contained in situ resources and may have been a storage area for specimens collected during the course of the expedition's scientific work. The excavation to remove the contaminated soil recovered several Thule culture organic artifacts collected by Greely and abandoned at the company's precipitate departure. The contaminated soil was



FIG. 7. Piles of arsenic trioxide in the north part of Greely's house at Fort Conger, before their removal by ESG technical experts in 2007. This particular colour of moss occurs only here and in the ditch leading from this spot to the bank eroding into Discovery Harbour.

replaced with clean soil from off-site and shipped south for disposal as hazardous waste. A few metal and glass artifacts and a harpoon head collected from the ground surface or in soil sampling holes dug in 2007 were found to be uncontaminated by arsenic (Moyle, 2008).

A necessary step in the risk management and remediation process was the Human Health and Ecological Risk Assessment (HHERA) completed by ESG in 2009 and reviewed by the Departments of Fisheries and Oceans, Environment, and Health. Its main objectives were to assess the potential impact of the inorganic contamination on human health and Fort Conger's ecology and to define a restricted area that could require remediation to protect ecological integrity while minimizing disturbance to cultural resources. On the basis of a "single point exposure," it was found that existing concentrations of arsenic and mercury are below the "target benchmark of acceptable risk" both to adults and to toddlers (ESG, 2009:V-18), who are not expected typical visitors at this remote location. The removal of soils with concentrations above ecological remediation objectives of 400 mg/kg for arsenic and 15 mg/kg for mercury was recommended. But the HHERA is missing an important consideration, as it does not adequately acknowledge the effects of risk management and

remediation on cultural resources. With additional funding from FCSAP, a strategy is being developed to address remediation and erosion impacts on cultural resources by striking a working group with archaeology, history, ecology, environmental impact assessment, and management representatives to guide decision making and by using the innovative technology of three-dimensional laser scanning to document Fort Conger. Identifying the impacts of remediation on cultural resources has three challenges: to set a threshold for bank erosion at which intervention is acceptable and necessary to protect both cultural and ecological resources; to monitor contaminants migrating to the marine environment; and to examine ground water dispersal and possible transport of contaminants.

A study of contaminant remediation at a South Polar camp is also instructive. At Casey Bay, Antarctica, the partial excavation and removal of material in the mid-1990s produced several adverse environmental effects, which included the exposure of “pockets of concentrated contaminants to flowing melt-water and resulted in transport of a greater than normal contaminant load into Brown Bay” (Snape et al., 2001:210). In this instance, the remediation measures caused a much greater problem than had existed at this site before remediation. At Fort Conger, determining a course of action to contain the contamination must be approached with great caution. Remediation should be pursued as a last resort when other methods have been tried and found wanting and the risks to humans and the environment require active intervention.

Parks Canada continues monitoring protocols to establish whether the risks to Fort Conger are static, or are worsening through contaminant migration or progressive bank erosion. In 2010, Parks Canada, in collaboration with the University of Calgary and SarPoint Engineering, Calgary, Alberta, undertook a three-dimensional laser scanning project at Fort Conger using a Z+F Imager 5006i laser scanner. Scans of three artifacts were also done with a Minolta Vivid 910 laser scanner. The purpose was to capture as a digital archive a complete synchronic record of the site with the intention of using the data for purposes of conservation, preservation, community outreach, and education. This digital archive, placed in a universally accessible repository for cultural heritage information, may become a catalyst for educational initiatives, raising awareness of cultural stewardship issues and ensuring that future generations have access to a record of human history that might otherwise have been lost forever (Dawson et al., 2010, 2013).

CONCLUSIONS

Fort Conger is a site of national and international significance. It is a cultural landscape comprising material remains that reflect the intellectual legacies of European explorers, scientists, and the Inughuit who assisted them. Consequently, the artifacts and standing structures at Fort Conger form a complex and overlapping cultural landscape,

in which the strict application of Western science was gradually replaced by a recognition of Inughuit knowledge as an equally valid set of practices for understanding and living in polar regions. This shift is perhaps best reflected in the complex of shelters built at Fort Conger in 1900, when Inughuit architectural practices were put to good use by American explorer Robert Peary. It is also reflected at ancillary sites, including shelters for temporary occupation related to resource use and more ephemeral sites connected to travel to and from areas of seasonal resource procurement.

Sadly, Western science activities in the 19th century left behind a toxic legacy that now threatens this important cultural landscape. Consequently, new forms of “science” will need to be implemented at Fort Conger to ensure it remains accessible to future generations. The recent use of 3D laser scanning to capture synchronic, high-resolution images of Fort Conger holds much promise. The success and demonstrated applicability of this technology in an extreme High Arctic environment is discussed in Dawson et al. (2013). It is intended that preserving the site digitally will be a foundation for successful conservation and education programs to excite the public’s imagination and inculcate awareness of stewardship responsibilities while physically sustaining the cultural integrity, historic authenticity, and sense of place of this exceptional landmark. We are seeking to meet the challenges of managing public outreach and interpretation by exploring ways of showcasing Fort Conger virtually for Canadians who will never have the opportunity to visit this remote and awesome site.

ACKNOWLEDGEMENTS

We acknowledge Tim Christie’s kind permission to use his image of the aerial view of Fort Conger. Monika Templin (Geomatics Technician for Parks Canada) and Tom Naughten (formerly with Parks Canada) produced the map. Comments on brief aspects of this paper were provided by Jane Chisholm (Ecosystem Scientist, Nunavut Field Unit); Dr. George Hobson (former director of the Polar Continental Shelf Project); Kevin Lunn (then Planner, Parks Canada); Dr. Micheline Manseau (Wildlife Ecologist, Parks Canada); Alex Stubbing (Quttinirpaaq Park Manager, Nunavut Field Unit); and Dr. P.D. Sutherland (Adjunct Professor in Archaeology at Memorial University in Newfoundland, Adjunct Research Professor in the Department of Geography and Environmental Studies at Carleton University in Ottawa, and Research Fellow at the University of Aberdeen, Scotland). Editing was ably provided by Diana Good and Lori McKinnon (Parks Canada). Perceptive reviewers’ comments strengthened the paper and are appreciated.

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