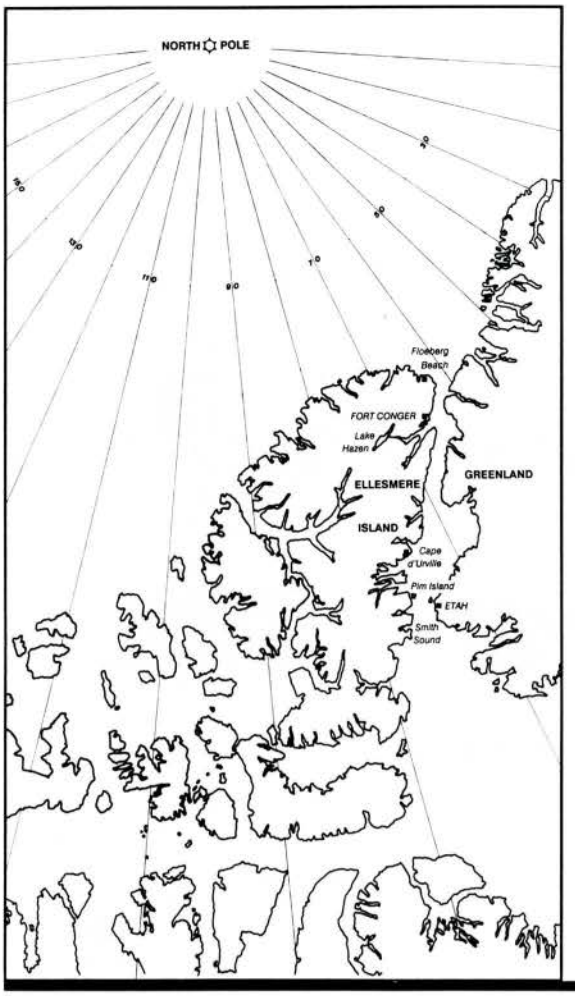
THE FORT CONGER SHELTERS

and Vernacular Adaptation to the High Arctic

The Fort Conger shelters in the spring of 1978. (Archaeological Services, Canadian Parks Service, Prairie and Northern Region)

In 1900 the American polar explorer Robert E. Peary and his party built three frame shelters as the core of a wintering complex at Fort Conger in northern Ellesmere Island. Despite their rudimentary character, these deceptively simple structures in fact can be viewed as monuments to the age of Euro-North American exploration in the High Arctic. Earlier British (1875-76) and American (1881-84) wintering expeditions to the Discovery Harbour site brought traditional European architectural techniques to their shelter, often with disastrous consequences. Peary avoided the mistakes of his predecessors by carefully studying and applying Inuit architectural principles and settlement patterns in the design of the shelters which stand today. More broadly, Peary's shelters at Fort Conger bear upon the nature of vernacular architecture itself. In particular, the surviving structures serve as a demonstration of the pragmatic, yet inventive approaches by which vernacular builders work with the materials at hand to arrive at conceptual solutions attuned to their environmental contexts.

By Lyle Dick



Visitors to Fort Conger in northern Ellesmere Island (Lat. 81° 44'N., Long. 65° 03'W.)(**figure 1**) may at first be impressed more by its dramatic history and natural setting than by its physical remains. This famous station, in its day the most northerly base camp in the world, today consists of three rudimentary wooden huts and some building foundations surrounded by a scatter of debris (**figure 2**). Unimpressive as they may initially seem, the shelters erected in 1900 by the party of the American explorer Robert E. Peary are nevertheless important monuments to the age of Euro-North American exploration of the High Arctic. These and earlier artifacts tell a fascinating story of hubris, disaster, and eventual adaptation to winter shelter and survival in one of the world's most severe climates. Of even greater interest, perhaps, than the historical associations is the process revealed in the forms of these shelters, a process that goes far to define the character of vernacular architecture.

In his book *The Friendly Arctic* Vilhjalmur Stefansson identified a series of stages in polar exploration that charted a progression from ignorance to wisdom in Euro-North American approaches to the Arctic. These stages included an initial period in which explorers so feared the North that they made only "furtive incursions into it by ship in summer." This was followed by a second stage, in which the North was still feared but a few men were willing to winter there. Stefansson summarized this phase:

> The hardy navigator penetrated as far north as might be for a ship and then, figuratively speaking, dug himself in and waited for winter to pass, coming out of his hibernation in the spring.[2]

Among the more distinguished examples of this second type of explorer was Captain Leopold McClintock, whose use of Inuit snow house and sledging techniques during his voyage of the late 1850s elicited Stefansson's praise. Yet McClintock's experience had little impact on his immediate successors. In particular, Stefansson cited the example of Captain George Nares, who served with McClintock and later led an expedition to Ellesmere Island, but ignored his advances.[3] The third stage represented a major breakthrough over both of the earlier phases and was marked by a realization that explorers could not only endure

The matter of winter quarters is one of pronounced importance to polar travellers, ranking second only to the question of an abundant supply of food.... A knowledge of Eskimo methods of house-building, combined with a little ingenuity, enables these needs to be secured with few and simple materials.[1]
Robert E. Peary

Figure 1. The High Arctic, showing northern Ellesmere Island and Fort Conger.

polar winters but thrive and work in this season. For Stefansson this stage was best exemplified by the methods of the American polar explorer Robert E. Peary, whose adoption of Inuit methods of survival extended to include native techniques of shelter, travelling, hunting, and clothing.

The progression from the heroic age of Euro-North American defiance of the environment to Peary's pragmatic adaptation is well represented in the history and physical remnants of three wintering expeditions to Discovery Harbour between 1875 and 1900. While separated by only a few years, the differences in their approaches to arctic shelter could not be more dramatic. These contrasting approaches culminated in the building of Peary's shelters of 1900, which revealed the critical importance of Inuit architectural principles (although this complex lacked the community patterns that sustained native wintering settlements over the long term). But beyond questions of form and content, the cognitive process by which these deceptively simple shelters evolved bears upon the nature of vernacular architecture itself. In particular, the Fort Conger structures serve as a demonstration of the pragmatic, yet inventive, approaches by which vernacular builders work with the materials at hand to arrive at conceptual solutions attuned to their environmental contexts.

The British Arctic Expedition led by Nares in 1875-76 was the first party to winter in northern Ellesmere Island since the Thule culture abandoned this remote region of the

1 Robert E. Peary, *Secrets of Polar Travel* (New York: The Century Company, 1917), p. 126.

2 Vilhjalmur Stefansson, *The Friendly Arctic: The Story of Five Years in Polar Regions* (New York: The Macmillan Company, 1944), p. 2.

3 *Ibid.*, p. 3.

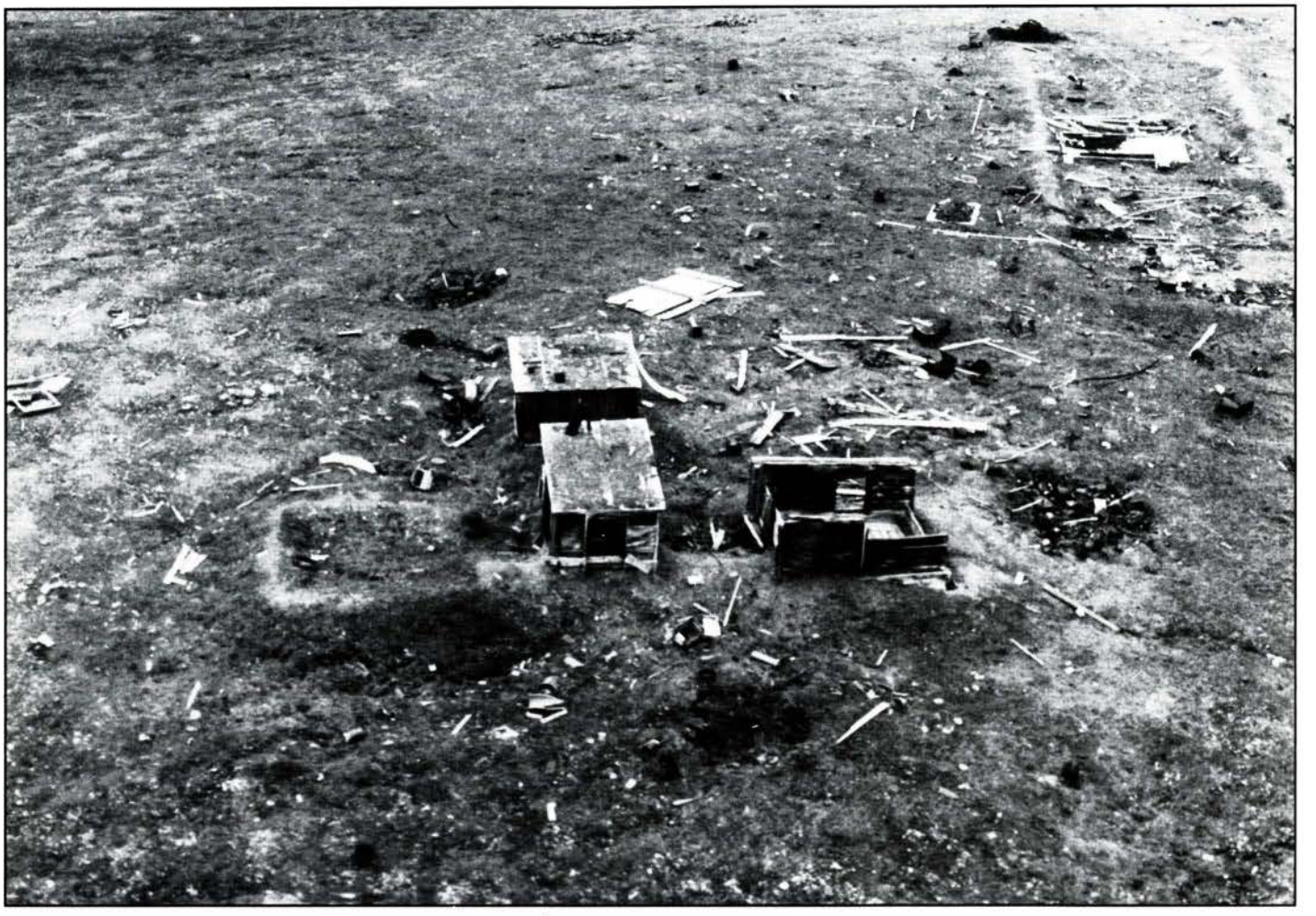


Figure 2. Aerial view of Fort Conger in 1979, showing the surviving shelters in the centre, the outlines of Peary's wintering tent and entranceway on the left, and the location of the kitchen site as indicated by the rectangular depression on the right. The remnants of the tunnel connection between the Dedrick and Inuit huts are visible in the centre, while the outlines of the former Greely house are shown in the upper right-hand corner. (Archaeological Services, Canadian Parks Service, Prairie and Northern Region)

High Arctic around A.D. 1450 due to climatic deterioration.[4] With orders to establish wintering quarters, conduct scientific observations, and carry out sledging excursions to the highest latitude north possible, the expedition's two ships set sail on 29 May 1875 and arrived at Lady Franklin Bay off Ellesmere's northeast coast in late August. Leaving H.M.S. *Discovery* under Captain George Stephenson to winter in the protected harbour that bears its name, Nares sailed on in the *Alert* to establish his own wintering quarters at Floeberg Beach at the northeastern tip of Ellesmere Island.[5]

As was the conventional practice during the Franklin era of arctic exploration, the crews of both the *Discovery* and the *Alert* wintered aboard ship. They first hauled the vessels to safe positions by the shore where they were anchored and frozen into the ice in autumn. At Floeberg Beach, after the onset of snow in November, they constructed a snow block wall 1.3 metres high about 2 metres from the ship's sides, and filled the intervening space with loose snow up to the channels, or sheaf holes for the rigging.[6] Cutting through this snow barrier, gangways of two or three steps led to hanging doors enclosing entrances cut into the bulwarks on both sides of the ship. The upper deck was also covered with a deep layer of snow and roofed in by a thick felt awning spread overhead across spars fastened between the masts. To provide an additional buffer, snow block passages with double wooden doors were constructed over the hatch entrances.[7]

Despite the attempt to avert the intrusion of cold air by building snow porches over the hatches, these structures actually ran counter to the fundamental principle behind their Inuit counterparts. Designed in conformity with axioms of gravity by which warm air rises and cold air falls, the Inuit porches were invariably built lower than the living quarters so that cold air from the outside was trapped in the porch, while warm air in the igloo would not escape.[8] But in the case of the Nares hatchway porches, gravity functioned to nullify the advantage of this intended buffer zone, as each entrance to or exit from the hold was accompanied by a cascade of freezing air. As Dr. Edward Moss, the *Alert*'s surgeon, wrote:

> We opened the inner door, a rush of cold air precedes us down the ladder, and we descend in a cloud of vapour like an Olympian deity.[9]

4 Robert McGhee, "Thule Prehistory of Canada," in David Damas, ed., *Arctic*, vol. 6 of *Handbook of North American Indians* (Washington, D.C.: The Smithsonian Institution, 1984), p. 375.

5 Capt. Sir G.S. Nares, *Narrative of a Voyage to the Polar Sea During 1875-6 in H.M. Ships "Alert" and "Discovery,"* vol. 1 (London: Sampson Low, Marston, Searle and Rivington, 1878), pp. 116-29.

6 Capt. Albert Hastings Markham, *The Great Frozen Sea: A Personal Narrative of the Voyage of the "Alert" During the Arctic Expedition of 1875-6* (London: Daldy, Isbister & Co., 1878), p. 180.

7 Dr. Edward L. Moss, *Shores of the Polar Sea: A Narrative of the Arctic Expedition of 1875-6* (London: Marcus Ward & Co., 1878), p. 31. [mimeographed transcription in the library of Canadian Forces Base, Alert, N.W.T.]

8 Stefansson, *The Friendly Arctic*, p. 177.

9 Moss, *Shores of the Polar Sea*, pp. 37-38.

To compound the difficulties, the snow porches, receiving the heated air from below, melted regularly, necessitating frequent repairs. In like manner the insulating layer of snow on the deck melted and froze into a slippery layer of ice.[10]

Additional problems developed below decks, where the living quarters were heated by eight coal-burning stoves. The *Alert*'s stoves irregularly maintained the interior temperature at a crisp average of 9.5° Celsius,[11] but for H.M.S. *Discovery* wide fluctuations between -6° and +20° Celsius were reported.[12] Attempts were made to regularize and better utilize the heat by directing it through horizontal flues under the overhead deck, but the flues smoked so much the men were obliged to revert to a vertical format.[13] Beyond the temperature changes other difficulties developed with poor ventilation and excessive condensation. Moisture formed continuously on the beams, requiring the constant attention of crew members to wipe it off. But when the hatch doors had to be opened for a few minutes this moisture froze and, on thawing, produced a constant drip. Consequently, all the books had to be moved from places in contact with the beams and walls.[14] In the officers' quarters, which was the dampest area, the men were obliged to rig waterproof coverings over their beds to divert the frequently dropping water.[15] An improvisation by one officer was to rig an umbrella over his chair, enabling him to read in relative comfort.[16] Yet, despite attempts to cut holes in the upper deck to provide up-takes and down-takes, the condensation troubles persisted throughout the winter. The dampness and extreme changes of temperature were later cited by Dr. Thomas Colan, expedition surgeon, as predisposing factors to the outbreak of scurvy suffered by the men.[17]

Interestingly, at Floeberg Beach, the men constructed a variety of snow block structures that showed an awareness of Inuit building techniques, but they used these structures to house their equipment and scientific instruments rather than people. For example, the magnetic observatory, named "Kew" after its English namesake, consisted of three igloos connected by snow block passageways. The practice of building snow structures on shore proved so popular that Captain Markham wrote of a "building mania" that infected the officers in October. Presumably working in the wintry outdoors was preferable to remaining inside in their cool damp quarters. One enthusiast went so far as to begin a "colonnade" of snow block pillars to extend from the shore to the ship. Whether he had Ionic or Corinthian capitals in mind is not reported, but the builder abandoned the project after a few days' work.[18]

The expedition might usefully have adopted the Inuit practice of erecting temporary igloos during sledging trips away from the ship. McClintock had found such shelters to work well during his travels in the 1850s. Yet Nares adhered to the earlier practice of housing his sledge parties in tents, just as he eschewed dog teams in favour of man-hauled sledging over the exceedingly rough land and sea ice surfaces of the region. The combination of exhaustion from the excessive physical demands of sledging, inadequate clothing and shelter, and scurvy incapacitated large numbers of the sledgers and contributed to four deaths. These tragedies were the subject of a Parliamentary investigation on the expedition's premature return to Britain in 1876.[19]

If the Nares expedition exemplified for Stefansson an inept regression to pre-McClintock methods, he was conspicuously silent on the topic of Lieutenant Adolphus Greely. Greely was the leader of the United States Army's Lady Franklin Bay Expedition which established Fort Conger in 1881. While improving somewhat on Nares's approach, Greely also made important errors in his techniques of shelter, with disastrous consequences.

With orders to establish a "permanent station" from which to carry out the scientific observation and exploration of this High Arctic region, Greely's party arrived at Discovery Harbour in August 1881. This time the expedition ship was not retained for the winter, and it departed after unloading men, supplies, and precut lengths of lumber for the prefabricated frame expedition house. Assembled within a few days, the house measured 18 metres long by 5.5 metres wide and featured 3-metre-high ceilings and a steeply-pitched gable roof with intervening loft space used for storage. Its double walls consisted of outside vertical boards, battened with tar paper and separated by an airspace from the tongued and grooved inner walls, also lined with tar paper. Similarly, tar paper was used to line the ceiling and roof boards. Inside, the structure was partitioned into three rooms: a central entrance and cook house, flanked by the officers' quarters and men's room.[20]

Greely's house was of questionable suitability for a High Arctic environment 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.[21] Nor did the expedition demonstrate an adequate knowledge of banking techniques for insulating purposes. The house was partially banked with sod, snow blocks, and loose snow, but inexplicably

10 Markham, *The Great Frozen Sea*, pp. 180-81.

11 Moss, *Shores of the Polar Sea*, p. 31.

12 Letter, Dr. Belgrave Ninnis, Staff Surgeon, H.M.S. *Discovery*, to the Director General of the Medical Department, 26 September 1876, in *Journals and Proceedings of the Arctic Expedition, 1875-6, Parliamentary Paper C-1636* (London: Harrison and Sons, Queen's Printer, 1877), pp. 464-65.

13 Moss, *Shores of the Polar Sea*, p. 31.

14 Markham, *The Great Frozen Sea*, pp. 183-84, 208.

15 Nares, *Narrative of a Voyage to the Polar Sea*, vol. 1, p. 182.

16 Markham, *The Great Frozen Sea*, pp. 208-9.

17 Letter, Dr. Thomas Colan, Fleet Surgeon, to the Director General of the Medical Department, in *Journals and Proceedings of the Arctic Expedition, Parliamentary Paper C-1636* (London: Harrison and Sons, Queen's Printer, 1877), p. 460.

18 Markham, *The Great Frozen Sea*, pp. 176-77.

19 United Kingdom. Parliament. *Report of the Committee Appointed by the Lords Commissioners of the Admiralty to Enquire into the Causes of the Outbreak of Scurvy in the Recent Arctic Expedition. Parliamentary Paper C-1722* (London: Her Majesty's Stationery Office, 1877).

20 Adolphus W. Greely, *Three Years of Arctic Service: An Account of the Lady Franklin Bay Expedition of 1881-84 and of the Attainment of the Farthest North*, vol. 1 (New York: Charles Scribner's Sons, 1886), pp. 82-91.

21 *Ibid.*, vol. 1, p. 121.

these were mounded only to a height of two metres.[22] For the second winter the banking was improved by carrying it up to the eaves, but the roof, through which most of the heat escaped, was left uncovered. Even after the improved banking, surgeon Dr. Pavy's diary entries revealed the continuing need to assign one or two men to haul coal from a nearby seam virtually on a daily basis.[23]

Greely ordered the stove fires put out each night, presumably to conserve fuel, or perhaps because of the risk of smoke or fire. It seems likely that the resulting cold night temperatures contributed to health problems among the men. In February 1883, Pavy reported in his diary that the command was "generally affected ... with chronic bronchitis."[24] The following month he wrote that he was treating various individuals for such complaints as rheumatism and general debility.[25] He subsequently attributed their weakened state to the hardships of arctic work, noting that contrary to the received wisdom, the body did not become accustomed to the cold through repeated exposure, but rather "less prepared to resist its effects,"[26] a view with which Peary was later to concur.

Despite its unwieldiness and energy inefficiency, the big house was evidently an improvement on Captain Nares' shipboard wintering arrangements. But when its supply ship was unable to penetrate the ice dam in Smith Sound in 1882, and another sank in a similar attempt the following year, the perils of polar unpreparedness were visited upon the ill-fated party. In August 1883 Greely ordered a general retreat in a small steam launch to Smith Sound to increase the likelihood of encountering a ship. At Camp Clay, on Pim Island, the party established wintering quarters, which became a dismal starvation camp.

Here, Greely's ignorance of Inuit techniques was demonstrated in the makeshift shelter his men constructed for a winter habitation. After selecting a site the men hauled rocks to build a low rectangular wall about a metre high on which they inverted the hull of a whale boat to serve as a roof. At the sides the boat was supported by oar blades inserted into holes cut into the gunwales and reaching across to rest on the stone walls. These tie beams were held in place by cables anchored in the ends of the wall and the whole was covered with canvas. Snow blocks were stacked outside the stone walls and also fashioned into a passageway and storehouse.[27] Yet no attempt seems to have been made to cover over the roof with either sod or snow.

How suitable this makeshift shelter was for High Arctic accommodation soon became apparent. By early November, Greely wrote:

> Our sleeping-bags and clothing were already frozen to the ground and their interiors were thawed only by the heat of our bodies, and froze solidly on quitting them. The roof and walls speedily gathered frost and ice, as did every other article in our wretched hut.[28]

Not only did the roof allow most of the shelter's heat to escape to the outside, Greely reported that on 1 December a violent storm caused drifting snow to blow through the roof, further lowering the interior temperature. Continuing storms unroofed the passageway and repeatedly filled it and the storehouse with snow.[29]

The story of the successive tribulations of Greely's party has been recounted several times and will not be discussed here.[30] It is sufficient to state that, under-nourished and suffering from frostbite, exposure, and respiratory diseases, the men began to die. When a rescue ship finally appeared the following June, only 7 of the original party of 25 men, including Greely, were still alive.

ROBERT PEARY FIRST ARRIVED AT FORT CONGER on 6 January 1899, after an arduous sledge journey up the east coast of Ellesmere Island from Cape d'Urville. He found the house largely intact, much as it was when Greely's party abandoned it in haste 15 years earlier. His initial approach to shelter at the site was to utilize the existing house, while making some adjustments to conserve fuel. During this first trip his party took refuge in the officers' quarters, their only intervention being the nailing up of this room's only outside door. By entering through the kitchen they averted the direct loss of heat to the outside which, not surprisingly, "made a pronounced improvement in the temperature," according to Peary.[31]

When he returned to Fort Conger that April, Peary made some additional changes in an effort to fit the station house as a suitable base for his future exploratory work. He decided to move his quarters to the central kitchen, presumably because two of its four walls were buffered by the officers' and men's rooms. His employees first doubled the walls of the kitchen and, in an attempt to make it air-tight, they stuffed rags in the spaces overhead and old clothes between the layers of the partitions.[32] After covering the partition surfaces on both sides with battened tar paper, they further lined the inside walls with blankets and canvas, and then fitted the room with bunks from the men's quarters.[33] Peary found that this

22 *Ibid.*, vol. 1, pp. 156-57.

23 Records of the Weather Bureau, Lady Franklin Bay Expedition, Box No. 12, Diaries of Dr. Octave Pavy, RG 27, U.S. National Archives, Washington, D.C. (hereafter USNA).

24 *Ibid.*, Pavy Diary Entry for 3 February 1883, fol. no. 376.

25 *Ibid.*, Diary Entry for 14 March 1883, fol. no. 200.

26 *Ibid.*, Diary Entry for 3 May 1883, fol. no. 331.

27 Adolphus W. Greely, *Three Years of Arctic Service*, vol. 2 (New York: Charles Scribner's Sons, 1886), pp. 171-74.

28 *Ibid.*, p. 195.

29 *Ibid.*, pp. 206-7.

30 See Greely, *Three Years of Arctic Service*, vol. 2, pp. 211ff.; Bessie Rowland James, ed., *Six Came Back: The Arctic Adventure of David L. Brainard* (Indianapolis/New York: Bobbs-Merrill Company, 1940), pp. 190-297; and L.H. Neatby, "The Greely Ordeal," *The Beaver* 292 (Autumn 1961), pp. 4-11.

31 Robert E. Peary, "In Greely's Old Camp at Fort Conger," *McClure's Magazine* 14 (January 1900), p. 239.

32 Dr. T.S. Dedrick Diaries, Notebooks and Other Papers, Diary of 17 January to 21 May 1899, Entry for 11 May 1899, Robert E. Peary Papers, Papers Relating to Arctic Expeditions, 1886-1909, Greenland, 1898-1902 (hereafter Peary Papers), RG 400/1, USNA.

33 Peary, "In Greely's Old Camp," pp. 239-40.

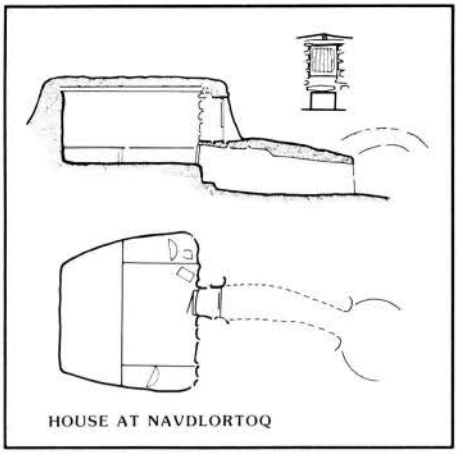


Figure 3. Polar Inuit winter dwelling at Navdlortoq, ca. 1960, showing the dug-out tunnel entranceway built lower than the sleeping platform of the house, with a snow domed vestibule indicated on the right. (Erik Holtved, "Contributions to Polar Eskimo Ethnography," Meddelelser om Gronland, vol. 182, no. 2 (1967), fig. 9, p. 17. Illustration redrafted by David Elrick)

room, so insulated, could be warmed by the old army range with a small amount of fuel. Additional improvisations included the conversion of the men's quarters to serve as the party's cold storage room. This change in function was achieved by clearing out the remaining objects and fixing "stringers" to the ceiling, presumably to be used for suspending frozen muskox carcasses.[34]

After wintering at Etah, Greenland, the party returned to Fort Conger in the spring of 1900. It was not long before Peary concluded that the Greely house was incompatible with his needs of appropriate arctic shelter. As he later wrote in his book *Secrets of Polar Travel:*

> This great barn of a structure, sixty feet long by 30 feet wide, was grotesque in its utter unfitness and unsuitableness for polar winter quarters. With its great size, its light construction, and its high-posted rooms, nine or ten feet from floor to ceiling, it embodied about everything that should not be found in winter quarters.[35]

Nor was Peary impressed with the practice of leaving a dead air space between the walls, the utility of which he regarded as a fallacy. One possibility he did briefly consider was the construction of an even smaller room within the shell of one of the large rooms of Greely's house. This option would have involved the use of the larger structure simply as a windbreak and building a smaller domicile with double walls, low ceiling, and tight joints. For a number of reasons,[36] he eventually rejected the option of refitting the Greely house in favour of using its lumber to build the three smaller structures that still stand today.

Peary's design for these shelters was the outcome of years of careful study and experimentation in High Arctic shelter. An assiduous reader of the literature of arctic exploration, he was undoubtedly acquainted with earlier explorers' accounts of Inuit snow villages of interconnected dwellings and ancillary structures in the Canadian Arctic, particularly among the Netsilik and Iglulik Inuit.[37] During his expeditions from the 1880s on he also had numerous opportunities to examine the Greenlanders' techniques of insulating their wintering dwellings with sod embankments, as well as their use of dug-out entrance tunnels to conserve heat (**figure 3**). To these techniques he added his own ideas which, combined with particular circumstances and available materials, produced an unorthodox, highly distinctive approach to arctic building.

In 1900 it was not Peary's preferred choice to build a completely new wintering complex at Fort Conger as he intended to rely on his supply ship the *Windward* for shelter. As he had done the previous winter at Etah, Greenland, he presumably would have floated ashore the railroad caboose he used as a deck house to serve as the nucleus of a shelter on land.[38] Alternatively, he might have planned to leave the caboose on deck and build snow block porches for it and crew's quarters in the topgallant forecastle, as he later did with the ship the *Roosevelt* at Cape Sheridan in 1908-09.[39] But when it became apparent by August that the ship was not likely to arrive, Peary's contingency plans came into play. Knowing that the season of warm weather during which the ground could be readily worked would last only a few weeks, he ordered his Inuit and American employees to commence digging the foundations of their prospective dwellings.[40]

The overall site plan for the complex involved the construction of individual shelters for himself and the other two Americans of his party—Dr. T.S. Dedrick and Matthew Henson—with a separate shelter for his Inuit employees. In an unpublished essay of the period, Peary explained his rationale for this plan as stemming from "the experience of several winters, the small numbers and the character of the members of my party, as well as personal preference indicate this plan as the best."

> Discipline, routine, etc., etc., so essential in a large party should in a party of this kind be reduced to the minimum. Each man should be able to secure privacy when he desires it and be able during the long night (meaning the sunless four months in winter) to act as he pleases (i.e. sleep when he pleases, keep his temperature as he pleases) without being disturbed by a feeling that he is disturbing others. Also to have his belongings about him undisturbed by anyone. This cannot be secured by a mere curtained apartment.[41]

Therefore, while the joining of these shelters with passages represented a partial accommodation to the communal principles of Inuit wintering villages, the discrete character of the dwellings expressed a more individualistic Euro-North American ethos.

As he had done in planning other wintering shelters, Peary gave careful consideration to the selection of an appropriate site for the complex. He was later to write that, in winter quarters, "warmth, dryness, and abundance of light are the great desiderata."[42] All of these objectives were reflected in his preferred site at Fort Conger. He chose an area about 15 metres to the northeast of the Greely house, adjacent to the army tent he had fitted for use as his summer shelter. This site occupies higher ground and has a steeper gradient than its Greely counterpart. Presumably it

34 Dr. T.S. Dedrick Diary of 17 January to 21 May 1899, Entry for 12 May 1899, Peary Papers, USNA.

35 Peary, *Secrets of Polar Travel*, p. 153.

36 R.E. Peary Diary, January-April 1901, "My Domicile at Conger," Peary Papers, USNA.

37 Guy Mary-Rousselière, "Iglulik," in David Damas, ed., *Arctic*, vol. 5 of *Handbook of North American Indians* (Washington, D.C.: Smithsonian Institution, 1984), p. 433. See also J.E. Nourse, ed., *Narrative of the Second Arctic Expedition Made by Charles Francis Hall: His Voyage to Repulse Bay, Sledge Journeys to the Straits of Fury and Hecla and to King William's Land and Residence Among the Eskimos During the Years 1864-69* (Washington, D.C.: Government Printing Office, 1879), pp. 128, 371; Franz Boas, *The Central Eskimo* (Lincoln, Nebraska: University of Nebraska Press, 1964), pp. 138-39; and Captain Leopold McClintock, *The Voyage of the "Fox" in the Arctic Seas: A Narrative of the Fate of Sir John Franklin and His Companions* (London: John Murray, 1859), pp. 258-59. See also "Communal Igloos" in Peter Nabokov and Robert Easton, *Native American Architecture* (New York/Oxford: Oxford University Press, 1989), p. 197.

38 Peary, *Secrets of Polar Travel*, pp. 150-51.

39 *Ibid.*, pp. 149-50.

40 Peary Diary, July-August 1900, Peary Papers,USNA.

41 *Ibid.*, Peary Diary, January-April 1901, "My Domicile at Conger."

42 Peary, *Secrets of Polar Travel*, p. 126.

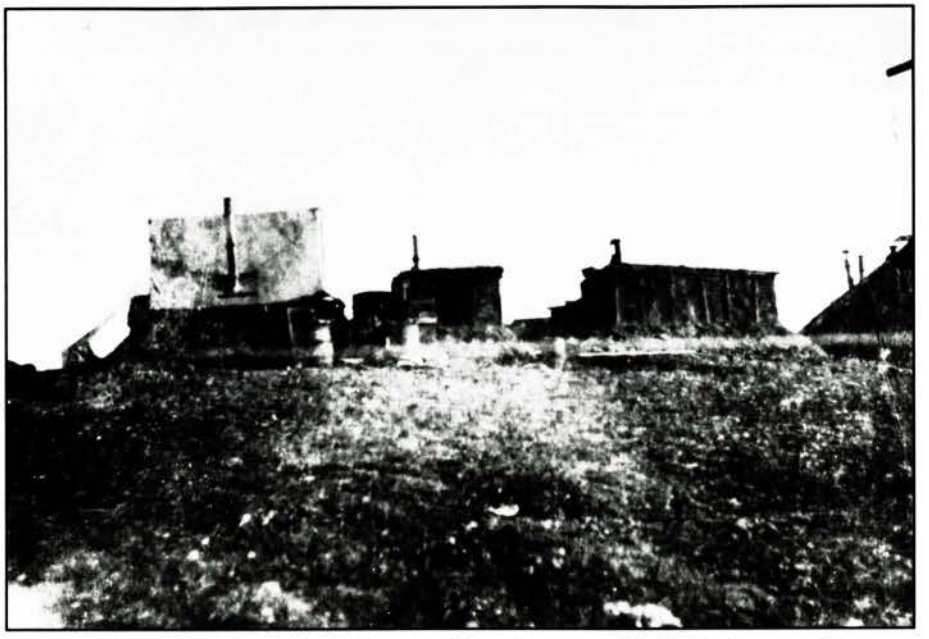


Figure 4. The Peary Fort Conger complex just after its completion, about August 1900. Peary's tent appears on the left, next to Dedrick's hut, with the Inuit dwelling and kitchen shelter on the right. The kitchen appears to have already been banked up to the eaves. (Robert E. Peary, © National Geographic Society)

was selected both for its superior drainage and the advantages afforded by the natural topography, facilitating the excavation of the partially dug-out structures.

Peary also designed the shelters to be in close proximity so that they could be connected by tunnel passageways, obviating the need to go outside when travelling between them. At Fort Conger the dug-out connections appeared to be a hybrid combination of native influences, as they emulated prototypes in both Greenland and the Canadian Arctic. The Polar Inuit had for centuries excavated long entrance tunnels to their stone houses to provide both a buffer from the outside cold and a controlled fresh air intake.[43] Typically, they took full advantage of the natural topography to dig these passages into the side of a slope, with the house invariably cut higher into the hill.[44] Peary reported that, in addition to the more permanent *igloo,* a house built entirely of stones, the Polar Inuit in the contact era were building two other types of dwelling—the *kangmah* and the *iglooyah,* or snow house. The *kangmah* was similar in structure to the stone igloo, except that its stone walls were roofed with sealskins stretched over driftwood sticks and covered over with turf.[45] While the *iglooyah* was often considered a more temporary shelter, the Polar Inuit were observed to occupy snow houses for weeks or even months at a time; these were made considerably warmer by the addition of an insulating layer of skins on the inside of the snow dome.[46] Peary incorporated aspects of all three of these structures into his complex at Fort Conger.

The igloo-sized shelters, which measured between 3 and 3.5 metres long and 2.15 to 2.8 metres wide, were of simple frame construction. The hut of Dr. T.S. Dedrick, Peary's surgeon for the expedition, appears to have been partially prefabricated and then assembled and nailed together. The other two structures were built by driving wooden corner posts into the ground at 45-degree angles, adding additional studs in the long sides, and nailing wall plates across the top of these vertical supports. Horizontal tongued and grooved boards were cut and nailed to the inside of the studs, leaving a space of 15 cm between the inner walls and their exterior counterparts, which were partially constructed of wood from the Greely expedition's packing crates and barrel staves.[47] The flat roofs were similarly constructed of tongued and grooved boards nailed across the wall plates, and sloped down to the north or east, away from the centre of the L-shaped cluster. Wooden strips were then used to tack tar paper to the roofs; these also served as retainers for the sand, gravel, and dirt that was heaped on the roofs for insulation.[48] Doors and windows were fashioned from a variety of materials. As if to underline its vernacular character, one of the doors was found by the archaeological recording team to bear an inscription of graffiti:

FROG EATER
N SALER [sic]
PROF
OF
ANATOMY

Evidently a mocking reference to the French ancestry of Corporal Nicholas Salor of the Greely expedition, this bit of army humour is thought to have earlier graced the inside of a privy door.[49]

43 See the plans and discussion of Thule culture dwellings in Erik Holtved, "Archaeological Investigations in the Thule District," *Meddelelser om Gronland,* vol. 141, no. 1 (1944), part 1, pp. 8-86. For a discussion of the principles of air circulation in Polar Inuit houses, see H.P. Steensby, "Contributions to the Ethnology and Anthropogeography of the Polar Eskimos," *Meddelelser om Gronland,* vol. 34, no. 7 (1910), p. 321.

44 W. Elmer Ekblaw, "The Polar Eskimo: Their Land and Life" (Ph.D. Thesis, Clark University, Worcester, Massachusetts, 1926), p. 118.

45 Robert E. Peary, *Northward Over the "Great Ice": A Narrative of Life and Work Along the Shores and Upon the Interior Ice-Cap of North Greenland in the Years 1886 and 1891-1897,* vol. 1 (New York: Frederick A. Stokes Company, 1898), pp. 501-502, n. 1. Peary discussed Inuit methods of construction in several of his books and articles. In the second volume of *Northward Over the "Great Ice,"* he presented a plan and cross-section dated March 1895 of a Polar Inuit snow house *(iglooyah)* at Peterahwik, Greenland. This dwelling featured an entrance passageway comprised of two snow-domed vestibules. The illustration also indicated the use of an interior sealskin lining, reminiscent of the practice of Baffin Island Inuit before and during the contact era. The Iglulik Inuit group that immigrated to the Thule region in the 1860s is said to have introduced this technique to the Polar Inuit at the same time that they taught this group the principle of the cold air trap achieved by constructing long entrance passageways. Peary, *Northward Over the "Great Ice,"* vol. 2, p. 427.

46 W. Ekblaw, "The Polar Eskimo," pp. 123-25.

47 Virgil Broodhagen, Caroline Parmenter, and Larry Konotopetz, "Fort Conger, Ellesmere Island, N.W.T., As Found Recording" (unpublished report, drawings, and photographs. Canadian Parks Service, Prairie and Northern Region, July 1979, photograph negative no. R3-11-18), and C. Phillips Parmenter, M. Burnip, and R. Ferguson, "Preliminary Report of the Second Season (1977) of Historical Archaeological Investigations in the High Arctic" (Canadian Parks Service, National Historic Parks and Sites Branch Manuscript Report, Ottawa, 1978), pp. 235-36, 241.

48 Parmenter, Burnip, and Ferguson, "Preliminary Report of the Second Season (1977) of Historical Archaeological Investigations in the High Arctic," p. 236.

49 C. Phillips Parmenter, "Northern Ellesmere Island Historical Archaeology: Preliminary Report of the 1979 Season of the Arctic Project" (Canadian Parks Service, National Historic Parks and Sites Branch Manuscript Report, Ottawa, 1979), pp. 12-14.

Figure 5. Canadian Inuit wintering settlement of connected snow houses. (J.E. Nourse, ed., Narrative of the Second Arctic Expedition Made by Charles F. Hall *(Washington, D.C.: Government Printing Office, 1879), p. 128. Illustration redrafted by David Elrick)*

Archaeological analysis has shown that the walls of the shelters comprised six layers of protection and insulation. These consisted, first, of a layer of tar paper tacked to the face of the outer wall of boards. This wall was separated by a layer of silt and gravel from the inner wall of lumber, the outside of which was also covered with tar paper. Finally, the inside face of this wall was lined with various types of paper, principally star charts and asbestos paper found in the Greely house.[50]

Peary's diary suggests that two additional insulating layers, i.e., earth and snow banking, should be added to this list. On 26 August 1900 he wrote that his Inuit companions "have their house banked nearly to the eaves" and that Dedrick, too, had mounded earth around his dwelling.[51] Three days later he wrote that the new kitchen shelter had been "sheathed, roofed, tar papered and partially banked in."[52] One of Peary's photographs from 1900 similarly shows the kitchen completely banked in to the roof (**figure 4**). After the onset of snow and its hardening by wind in the winter, the party added snow block walls which, coupled with natural drifting of snow, completed the last layer of protection.[53]

In the contact era Polar Inuit winter dwellings were not connected physically, although such connections were commonly found in Inuit complexes of the Central Arctic (**figure 5**). For example, Sir John Richardson wrote of the Nelsilik Inuit in the 1850s: "Social intercourse is promoted by building houses contiguously, and cutting doors of communication between them, or by erecting covered passages."[54] To provide sheltered access between the Fort Conger huts, tunnels were dug and banked to connect, Inuit-style, to low-lying doorways (**figure 6**). These were roofed over with canvas and muskox skins, and after the onset of snow, with snow block domes.[55] In like manner, Peary instructed his Inuit companions to strike their summer tents in September and to rig the canvas over a passageway linking his tent and Dedrick's hut to the kitchen shelter they had built on the west side of the complex.[56] Therefore, while the principle of connecting the units was derivative of Canadian Inuit practice, the specific means employed at Fort Conger were consistent with Polar Inuit techniques.

Peary also opted for a highly unorthodox improvisation for his own winter shelter, which he decided to build around the nucleus of the "A" tent he had scavenged for use as his summer domicile. He explained his rationale for this departure from his plan as "partly to economize the lumber, partly as a practical experiment, and partly to furnish occupation and amusement" for himself.[57]

He began by driving four posts into the gravel to define a rectangle 2.5 metres by 3.5 metres, and connected the tops with 6 x 8 cm joists. The tent poles were then set into the ground, braced diagonally, and the tent stretched over this framework. As with the other shelters, he improvised with an unusual assortment of the available materials for various purposes. For example, for heating facilities he fashioned a stove out of a ten gallon sheet-iron oil cylinder left by the Nares expedition, and from a few lengths of vitrified sewer pipe he built a chimney. With the installation of a floor of old boards from a Fort Conger lean-to, an inner window sash from the big house that he set into the south wall of the tent, and a door from Greely's magnetic observatory, the shell of his residence was in place.[58]

To stiffen the tent from flapping Peary laid rafters of former telegraph poles spaced 60 cm apart, and lined the wall with old blankets. He carpeted the floor with pieces of old tarpaulins, furnished the room with Greely's curtains and desk and Lieutenant Lockwood's cot, and lined the walls with signal flags and calico from the loft of the Conger house. Peary covered the whole with a large tarpaulin that formerly covered Greely's biscuit barrels, and heaped gravel on the ends until the tent was banked in to the height of the wall.[59]

With the arrival of cold weather, Peary blanketed the sides of the tent above the wall with the remaining mattresses from Greely's house and sewed these together. He then covered the gravel with a layer of turf and erected an additional wind barrier of turf 25 cm wide and rising 25 to 50 cm above the embankment. In late October he built a snow block wall around the ensemble, filled in the space between the wall and the mattresses with loose snow, and threw water on it until it became a solid envelope, impervious to wind.[60]

Peary's insulated tent was connected to the other structures in the complex by a canvas passageway linking it to Dedrick's shelter. Dedrick, who supervised its construction, wrote that this porch extension was fashioned from "seven old canvas stable short coats"[61] (**figure 7**). When hardened snow became available, he and Peary added a snow domed vestibule with a curtained door to act as an additional buffer.[62] Peary also reported the presence of a shared snow-block entrance to Dedrick's and Henson's shelters,[63] which presumably connected to the tunnel passageway between these structures. The Danish ethnographer Erik Holtved has noted that such snow structures were commonly added to Polar Inuit houses in winter.[64] A plan of a typical Polar Inuit house of the post-contact era, with subterranean passageway and outer snow domed vestibule, is shown in figure 3.

50 Parmenter, Burnip, and Ferguson, "Preliminary Report of the Second Season (1977) of Historical Archaeological Investigations in the High Arctic," pp. 235-36.

51 Peary Diary, Entry for 26 August 1900, Peary Papers, USNA.

52 *Ibid.*, Entry for 29 August 1900.

53 See, for example, Peary's Diary Entry for 13 December 1900.

54 Sir John Richardson, *Arctic Searching Expedition: A Journal of a Boat Voyage Through Rupert's Land and the Arctic Sea in Search of the Discovery Ships Under Command of Sir John Franklin,* vol. 1 (London: Longman, Brown, Green, and Longmans, 1851), pp. 215-16, quoted in Marcel Mauss, *Seasonal Variations of the Eskimo: A Study in Social Morphology,* trans. James J. Fox (London: Routledge and Kegan Paul, 1979), p. 107, n. 89.

55 Greenland 1898-1902, T.S. Dedrick Diaries and Other Papers,1898-1901, Miscellaneous Papers and Field Notes, Entry for 25 October 1900, Peary Papers, USNA.

56 Peary Diary Entry for 2 September 1900, Peary Papers, USNA.

57 Peary, *Secrets of Polar Travel,* p. 154.

58 R.E. Peary Diary, January-April 1901, "My Domicile at Conger," pp. 1-5, Peary Papers, USNA.

59 Peary, *Secrets of Polar Travel,* pp. 154-55.

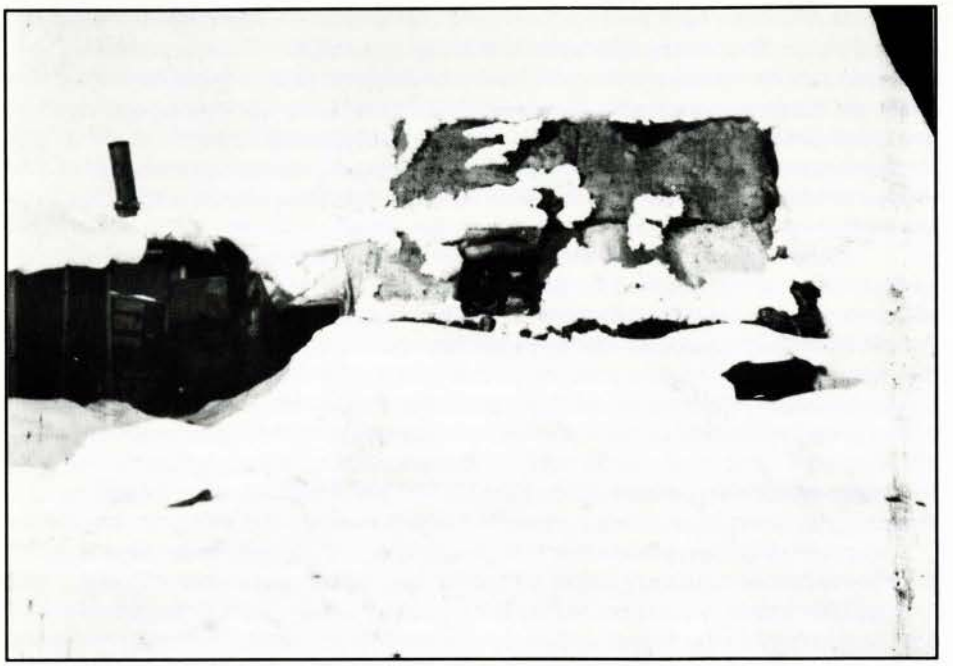
60 *Ibid.*, p. 155; and "My Domicile at Conger," Peary Papers, USNA.

61 Dedrick Field Notes, Entry for 21 September 1900, Peary Papers, USNA.

62 Peary Diary, January-April 1901, "My Domicile at Conger," p. 8, Peary Papers, USNA.

63 Peary Diary Entry for 25 December 1900, Peary Papers, USNA.

64 Erik Holtved, "Contributions to Polar Eskimo Ethnography," *Meddelelser om Gronland,* vol. 182, no. 2 (1967), p. 15.



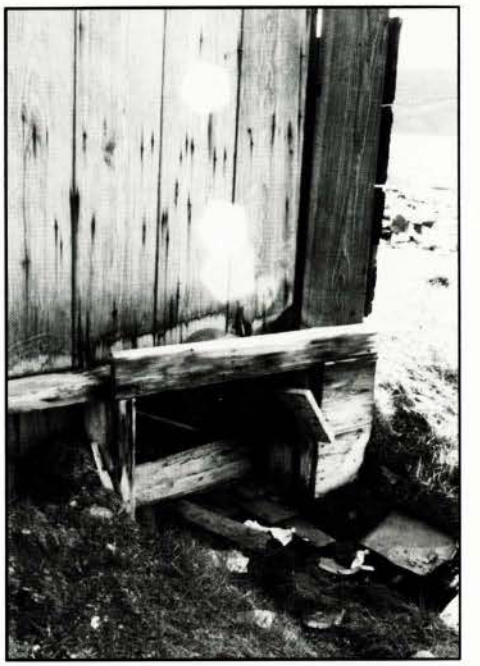


Figure 6 (above). Remains of low-lying entrance to the Inuit shelter from the tunnel connecting to Dedrick's hut, Fort Conger, 1979. (Archaeological Services, Canadian Parks Service, Prairie and Northern Region)

Figure 7 (above left). Photograph from the spring of 1901, showing Peary's wintering tent on the right and Dedrick's frame shelter on the left. The canvas connection between the shelters appears in the centre, while Peary's insulating layers of sod and army mattresses are visible under the melting snow. (Robert E. Peary, © National Geographic Society)

For cooking facilities Peary excavated a rectangular area just west of the huts, installed one of the Fort Conger stoves, and erected a frame kitchen around it. This structure has not survived but the outlines of its foundation indicate that it was somewhat larger than the shelters, and set slightly farther away, probably for fire safety (**figure 8**). The building of a separate kitchen structure in itself represented a marked improvement over the Greely expedition, owing to the fire risk of combining kitchen and living areas in wooden buildings. As with the other shelters, the kitchen was lined with tar paper and completely banked in for winter use.[65]

How suitable was Peary's Fort Conger complex for High Arctic habitation? It seems appropriate to evaluate the shelters both in terms of their environmental and socio-cultural aspects. As the French ethnologist Marcel Mauss observed nearly one hundred years ago, Inuit forms of shelter are not reducible solely to environmental considerations, but also incorporate important principles of social organization and group interaction.[66] In this regard anthropologist Kwang-Chih Chang has proposed an important distinction between the terms "settlement patterns" and "community patterns" in circumpolar societies. In this typology such environmental issues as siting in relation to topography or natural resources, seasons of occupation, and subsistence activities fall under the rubric of settlement patterns. On the other hand, the positioning of constituent houses in terms of political relationships, social ties, and other cultural aspects collectively define the community pattern.[67]

With regard to its settlement pattern, the Peary complex closely paralleled Inuit principles of siting and grouping of dwelling units. As low-lying structures dug into a rise and mounded over with earth and sod, they would have functioned well to deflect the high winds that characterize this region.[68] The semi-subterranean character of the dwellings and their small size, clustering, and interconnectedness enabled an adequate degree of warmth for a minimal expenditure of fuel. Peary later reported that on returning to Conger from his fall hunting trips he could "warm the interior of my tent to a comfortable temperature by the judicious burning of a yard of tar roofing paper in my sheet iron stove."[69] Similarly, his employees experienced few problems in heating their shelters; on 20 December 1900 he wrote of Dedrick's dwelling that "very little coal keeps his house so warm now that he goes naked to the waist practically all the time, and some of the time entirely nude."[70]

Moreover, the building of a complex of separate shelters also afforded energy savings by enabling Peary's party to close off one or more of the units when the men were away from the station on longer hunting trips. For example, on 27 February 1901 Peary reported that he had closed Dedrick's shelter while the doctor was at Lake Hazen.[71] The following month, while Peary was in the field, Dedrick wrote that several of the Inuit had moved into his own house, and so "two fires only will be run."[72] This practice, too, was anticipated by the Inuit tradition of sealing off temporarily-unused igloo units in snow house complexes to conserve heat.[73]

At the same time, the community pattern of the Fort Conger complex represented a significant departure from the cultural contexts of its Inuit counterparts. In Inuit wintering

65 Peary Diary Entry for 29 August 1900, Peary Papers, USNA.

66 Mauss, *Seasonal Variations of The Eskimo*, p. 21.

67 Kwang-Chih Chang, "A Typology of Settlement and Community Patterns in Some Circumpolar Societies," *Arctic Anthropology*, vol. 1, no. 1 (1962), pp. 28-41.

68 Amos Rapoport, *House Form and Culture* (Englewood Cliffs, N.J.: Prentice-Hall, 1969), p. 98.

69 Peary, *Secrets of Polar Travel*, pp. 155-56.

70 Peary Diary Entry for 20 December 1900, Peary Papers, USNA.

71 *Ibid.*, Peary Diary Entry for 27 February 1901.

72 *Ibid.*, Letter, Dedrick to Peary, 10 March 1901, T.S. Dedrick Diaries, Notebooks, and Other Papers, 1898-1901, VI, Folder 6.

73 Nabakov and Easton, *Native American Architecture*, p. 199.

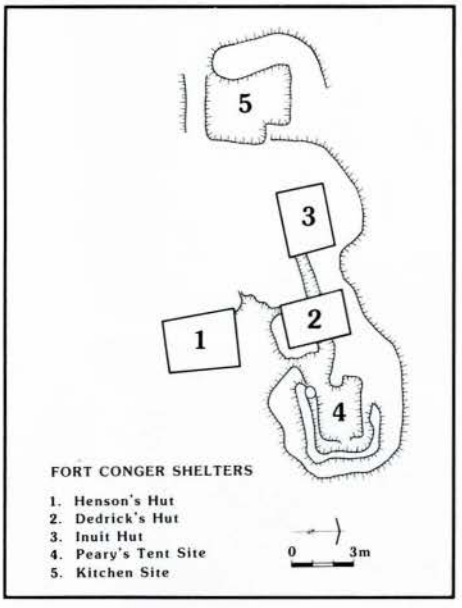


Figure 8. Plan of the Fort Conger shelters, adapted from the site plan by Caroline Phillips, 1979. (Archaeological Services, Canadian Parks Service, Prairie and Northern Region. Illustration drafted by David Elrick)

settlements the clustering of dwellings functioned to ameliorate the insecurity and scarcity of the dark period. The banding together of Inuit not only facilitated the communal sharing of food resources, but occasioned the group's participation in religious or shamanistic activity, feasts, and the sharing of sexuality. In the wintering context, family ties were supplemented and to a degree supplanted by obligations to the larger body, the community.[74] The communalistic character of such villages was also reflected in the spatial arrangement of individual dwellings, which expressed an absence of hierarchy among their constituent families (**figure 5**).

Ethnologists and other visitors to the Thule region have remarked on the importance of social interaction in winter to the Polar Inuit. For example, Eivind Astrup, who participated in two of Peary's expeditions to north Greenland in the 1890s, wrote that "a chief reason which makes it possible for the Esquimaux at Smith's Sound to endure the long winter nights of four months is their social disposition." He went on to observe that young people "generally occupy more of the time of darkness in visits to relatives and friends than they spend at home."[75] In like manner, Jean Malaurie, the French anthropogeographer who spent a year with the Polar Inuit in the early 1950s, reported on the winter practice of visiting and communal drum dancing, often extending far into the night.[76] More generally, Mauss has attributed to such winter activities the vital role of renewing group solidarity in all Inuit societies.[77]

At Fort Conger, a very different dynamic was at work. Despite its similarity in appearance to Inuit settlements, Peary's Fort Conger complex was not an egalitarian community. If it is true of architecture, as Claude Lévi-Strauss has argued, that "spatial configuration seems to be almost a projective representation of the social structure,"[78] then the arrangement of the Fort Conger shelters is suggestive of its own distinctive social organization. Peary's tent connected directly to only one other dwelling—the shelter of Dr. Dedrick, his second-in-command. In turn, the dwelling of Dedrick, who was charged with conveying Peary's orders to the other members of the expedition, was linked to the dwellings of his subordinates—Matthew Henson and the Polar Inuit—by the tunnel passageways between them (**figure 8**). Given that its connecting links served to mitigate these relationships, the complex was nevertheless organized to maintain a degree of social distance and to reinforce its underlying hierarchical command structure.

Whereas the Inuit communities were concerned with subsistence to foster group goals, Peary was preoccupied with generating a surplus to support his individual exploration objectives. During the winter of 1900-01, Peary was determined to secure large quantities of game—principally muskox meat—not only for subsistence but in support of an assault on the North Pole intended for the following spring. To this end, he sent parties to the interior on long hunting trips throughout the winter; this regimen separated family members or friends for extended periods. Such separations were not without psychological consequences, as Dedrick noted: "Soundah does poorly when Pooblah is gone, is listless, eats little and sleeps all the time."[79] Whatever the comfort level of the shelters at Fort Conger, when working in the interior for much of the winter Peary's employees were housed in crowded conditions in more rudimentary igloos. In a letter to Peary in February 1901, Dedrick complained: "The circumstances which have compelled the party to live in such igloos so continuously are a great misfortune."[80] Back at Fort Conger, Inuit winter patterns of group interaction were effectively thwarted by Peary's imposition of a 10 p.m. noise curfew, and while no set time was imposed for retiring, each person was expected to rise to work a full day.[81] Peary viewed such a work routine throughout the winter as essential to the well-being of his party, but his and Dedrick's diaries reveal a tendency of all its members, including the Inuit, to experience depression and malaise during the dark period. Therefore, while Peary's settlement pattern was well designed for physical survival, his accompanying community pattern and activity structure seem to have represented a less successful adaptation to the psychological stresses of the dark High Arctic winters.

After the winter of 1900-01 the Fort Conger shelters continued to serve as an ancillary base for Peary's polar expeditions in 1905-06 and 1908-09. Subsequently, the complex was occupied for short periods by other American, Danish, and British expeditions until 1935. One of the best documented of these was the visit of scientist Lauge Koch's Danish Bicentenary Jubilee Expedition of 1920-23, which was at Fort Conger between 6 and 19 April 1921.[82] Koch was accompanied by several Inuit who had been at Fort Conger before, including one man who had participated in the construction of the shelters. Finding the Peary structures "still in a rather good condition," the party set up their headquarters in one that the Inuit identified as "Peary's house" — apparently the former Dedrick shelter. Ironically, the Inuit community pattern formerly suppressed at the complex was now revived, as the Inuit, in "high spirits," sang drum songs long into the night.[83]

74 Mauss, *Seasonal Variations of The Eskimo,* pp. 53-75.

75 Eivid Astrup, *With Peary Near The Pole* (London: C. Arthur Pearson, Ltd., 1898), p. 278.

76 Jean Malaurie, *The Last Kings of Thule,* trans. Adrienne Foulke (Chicago: University of Chicago Press, 1982), pp. 114-18.

77 Mauss, *Seasonal Variations of The Eskimo,* p. 59.

78 Quoted in Kwang-Chih Chang, "A Typology of Settlement and Community Patterns," p. 37.

79 Fieldnotes, Letter, Dedrick, Mouth of Croz. River, to Peary, Fort Conger, 27 February 1900, pp. 4-5, T.S. Dedrick Diaries, Notebooks, and Other Papers, 1898-1901, VI, Folder 6, Miscellaneous Papers of T.S. Dedrick, Peary Papers, USNA.

80 *Ibid.,* p. 5.

81 Peary, *Secrets of Polar Travel,* pp. 157-58.

82 Lauge Koch, "Report on the Danish Jubilee Expedition North of Greenland, 1920-23," *Meddelelser om Gronland,* vol. 70 (1927), pp. 60-63.

83 *Ibid.,* p. 61.

Where do the Fort Conger shelters fit into the architectural history of the High Arctic? Since Peary deliberately waited until after he had completed his polar expeditions before revealing his exploration strategies, he had few immediate successors. With the appearance of his book *Secrets of Polar Travel* in 1917, his ideas finally appeared in print. The principal vehicle by which the Peary approach to High Arctic shelter was disseminated may not have been his own writing but rather the work of Vilhjalmur Stefansson, a noted explorer in his own right and a friend and admirer of Peary. In 1935 the United States Army hired Stefansson to write a manual to educate military personnel about arctic environmental conditions and survival techniques. First printed in 1940 and widely distributed among the American armed forces, Stefansson's manual was subsequently released for commercial publication by the Macmillan Company in 1943. While it is difficult to establish a direct connection, Stefansson's instructions in this manual for the construction of an "emergency house" closely conformed to Peary's practice at Fort Conger as revealed in his book and unpublished papers.[84] With its wide distribution among military and civilian populations during this period of greatly expanded activity in the Arctic, Stefansson's manual assured the popular dissemination of the techniques earlier pioneered by Peary.

More broadly, the history of the Fort Conger shelters invites a re-thinking of the architectural categories within which vernacular structures are commonly placed. As Joseph Rykwert has shown in his survey study of the "primitive hut," writing from Vitruvius to the present has often consigned such structures to an early stage in the evolution of Western architecture. Even major 20th century theorists such as Le Corbusier, who admired their architecture, viewed so-called "primitive" builders as noble savages guided largely by instinct.[85] More recent studies of vernacular architecture acknowledge the appropriateness of these building strategies in their particular environmental or cultural contexts, but similarly draw binary distinctions between Western and "primitive" architects, who are said to respond structurally to their environments in stereotyped patterns.[86] Yet, as we have seen, Peary's Fort Conger complex and its Inuit antecedents speak to a far more sophisticated approach than such categories would indicate.

A useful way to interpret Peary's structural development at Fort Conger might be to refer to anthropologist Claude Lévi-Strauss's concept of *bricolage*. Lévi-Strauss distinguished between two types of science — the abstract Western science, analogous to the approach of an engineer, and the concrete or applied science of non-Western societies. The latter he compared to the work of a *bricoleur*, or handyman. Where the engineer designs special tools and conceptual frameworks for each new problem, the *bricoleur* pragmatically re-works materials within pre-existing mental structures to arrive at a suitable solution. Lévi-Strauss criticized both the ethnocentric classification of such approaches as "primitive" as well as its binary opposite, i.e., the rejection of European culture in favour of "going native." Both Western and native approaches have their merits, and one should not be privileged over the other. Moreover, Lévi-Strauss did not view the two types of science as mutually exclusive; he also used the term *bricolage* to signify a means of "communicating" or mediating between these categories.[87] Nor are these categories of thought found only in one culture to the exclusion of the other. Lévi-Strauss intended the term "the savage mind" to apply to the kind of "untamed thinking" that for him characterized practitioners of *bricolage* in Western as well as non-Western societies, while he rejected the notion that so-called "primitive" cultures were incapable of abstract thought.[88]

It can be seen that this model elegantly explains Peary's approach to the Fort Conger shelters. This complex gave him an opportunity to combine in new and innovative ways his knowledge of Western frame constructional practice with native techniques. While Peary's community pattern reflected Euro-North American—and specifically military—notions of hierarchy, he nevertheless borrowed heavily from the interconnected structure of Inuit communal settlements. At the same time, such improvisations as the refitting of Peary's summer tent to serve as a winter dwelling represented a pragmatic accommodation to existing circumstances and available materials.

More important, perhaps, than specific techniques, Peary developed an *attitude* to arctic building that paralleled the approach of his Inuit companions. Their *bricolage* entailed both the reshaping of the existing universe of materials to meet new challenges and the development of conceptual solutions consistent with a profound knowledge of the polar environment. Where Peary appeared to fall short was in his failure to appreciate that Inuit community patterns were as important to their long-term adaptation as their settlement morphologies. At the very least, his Fort Conger shelters demonstrated that if explorers could not conquer the High Arctic with Western methods, they could physically survive in this region by studying and emulating Inuit settlement patterns, architectural principles, and adaptive ingenuity.

84 Vilhjalmur Stefansson, *Arctic Manual* (New York: The Macmillan Company, 1943), pp. 150-52. In terms of general principles, Stefansson recommended building walls thick enough so that heat could not escape, except through openings deliberately provided for ventilation. He wrote that, invariably, shelters should be constructed so that they would be entered from below through an open trap-door, which also would serve as the air intake for the shelter's ventilation. In coastal areas where driftwood was available, Stefansson recommended that builders begin by digging holes within which to erect posts to define the four corners of the house. Next, four logs should be laid across the four posts to define the tops of the four walls, which could be filled in with whatever materials were available, such as sticks, split logs, and so on. He further recommended that after the location of the door was determined, builders should dig a trench about a metre in width and bridge it over with wood where it was to go under the wall. Tunnel entrances needed to be excavated at least 1 to 1.3 metres below the floor level, and to extend at least 3 metres away from the habitation. After digging this trench, builders were instructed to mound earth around the shelter framework to a thickness of 1.3 to 1.6 metres at the bottom and 0.3 to 0.5 metres at the eaves. Finally, Stefansson advised covering the rafters with a 7 to 14 cm layer of earth. All of these recommended techniques were earlier implemented by Peary at Fort Conger.

85 Joseph Rykwert, *On Adam's House in Paradise* (Cambridge, Mass.: The MIT Press, 1987), pp. 12-39.

86 See, for example, Rapoport, *House Form and Culture*, pp. 3-4.

87 Claude Lévi-Strauss, *The Savage Mind* (Chicago: University of Chicago Press, 1966), pp. 16-36. See also David Pace, *Claude Lévi-Strauss: The Bearer of Ashes* (London: ARK Paperbacks, 1986), pp. 139-43.

88 Pace, *Claude Lévi-Strauss*, p. 142; David Carroll, *The Subject in Question: The Languages of Theory and the Strategies of Fiction* (Chicago: University of Chicago Press, 1982), pp. 162-63.

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