The Movement of Cultures in the Canadian High Arctic*

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Much of the sport in archaeology has come from being the first to predict the most unexplored terrain. As logical deduction is reinforced with pertinent geographically-peripheral data, the arguments become more and more convincing. Such has been the fate of the Canadian High Arctic, north of 75° North Latitude, and particularly northern Ellesmere Island vis-à-vis the origin and movement of cultures in the eastern Arctic.

In 1882, Lt. A.W. Greely[1] found that northern Ellesmere was cut transversly from southwest to northeast by a low, broad, valley, filled in part by 46 mile long Lake Hazen. This ice-free valley gave access at its western end to the western islands of the Canadian Archipelago, and on its eastern end to the Greenland Coast across a frozen strait some 35 miles wide. In limited surface collecting, Greely's party picked up a small but significant assemblage of prehistoric Eskimo materials, both on the lake shore, and along the fiords to the east of it. Seventy years before Greely, Ross[2], making initial contact with the Cape York Polar Eskimos, found that they had no knowledge of other people to the south of them. Steensby[3], in 1910, combined Ross' observation with Greely's evidence to postulate a northward migration route for his Caribou Hunting Eskimos. These Caribou Hunters, he felt, had traveled through the western inlands of the archipelago, across the Hazen Valley, and into northwestern Greenland where they lived, out

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[1] GREELY, A.W., *Three Years of Arctic Service: an account of the Lady Franklin Bay Expedition of 1881-1884, and the attainment of the farthest north.* Vols. I and II. C. Scribner and Sons, New York, 1886.

[2] ROSS, Sir John, *A Voyage of Discovery.* J. Murray, London, 1819.

[3] STEENSBY, H.P., "Contributions to the Ethnology and Anthropogeography of the Polar Eskimo", *Meddelelser om Grønland,* Bind 34, Kobenhavn, 1910.

of contact with the maritime hunters to the south of them. This migration route was reproduced in most articles on Arctic migration from then on.

Unfortunately, Greely's collection has, so far as we know, never been seen by others than the original field party. It is known only through a few rather poorly engraved plates of part of the collection. On the basis of one illustrated harpoon point which might be Dorset in type, Mathiassen[4], and later Rowley[5], predicated a Dorset site in the Hazen Valley. Presumably on the same basis, Giddings in 1956[6], indicated the same location in an Arctic distribution of micro-blades. At the same time he clairvoyantly indicated Lauge Koch's Dorset site on Polaris Promontory, northwestern Greenland, at which the first micro-blade was found in 1958. Admittedly, this was a logical extrapolation since Knuth in 1952[7], and 1954[8], had reported two early stone tool horizons in northeastern Greenland, and suggested that these assemblages must have had their cultural base in northern Ellesmere Island.

Now that this *terra incognita* has become largely *terra cognito,* it is time to inventory the material actually found on Ellesmere Island, and to re-arrange hypotheses of cultural movement where necessary.

In the summer of 1958, as an officer *pro tempore* of the National Museum of Canada, it was my good fortune, in company with seventeen other scientists, to explore the Hazen Valley and adjoining fiords.[9] We covered 416 linear miles of terrain; over 350 of those miles on foot. Of the more than 800

[4] MATHIASSEN, Th., "Eskimo Relics from Washington Land and Hall Land", *Meddelelser om Grønland,* Bind 71, Kobenhavn, 1928.

[5] ROWLEY, Graham, "The Dorset Culture of the Eastern Arctic", *American Anthropologist,* Vol. 42, Menasha, Wisc. 1940, p. 497.

[6] GIDDINGS, J.L., Jr., "A Flint Site in Northernmost Manitoba", *American Antiquity,* Vol. 21, 1955-1956, pp. 255-268.

[7] KNUTH, Eigil, "An Outline of the Archaeology of Peary Land," *Arctic,* Vol. 5, No. 1, 1952, pp. 17-33.

[8] KNUTH, *Eigil,* "The Paleo-Eskimo Culture of northeast Greenland Elucidated by Three New Sites", *American Antiquity,* Vol. 19, 1954, pp. 367-381.

[9] MAXWELL, Moreau S., *An Archaeological Analysis of Eastern Grant Land, Ellesmere Island, Northwest Territories.* Bulletin 170, National Museum of Canada, Ottawa, 1960.

square miles closely inspected, almost all were seen twice; once from the ground and once from the air. Favorable camping sites such as deltas, estuaries, raised beaches, and terraces were literally covered on hands and knees. In the area of the survey, 33 habitation sites were located; all but a very few only temporary camp sites. The information recovered is such that we can state that the Hazen Valley, and northern Ellesmere Island generally, was neither a migration highway nor a dispersal base in the Arctic Small Tool, or Pre-Dorset, spread of culture, the Dorset spread, or the Inuk-Thule spread. To the contrary, occupants seem to have come relatively late to northern Ellesmere, and to be marginal to settlements on the north-western coast of Greenland.

This negative evidence, then, is the most significant point of my report. Negative results are, of course, difficult to prove, leaving doubts even in the original researcher's mind, but I feel that the thoroughness of our initial survey was such that we should no longer speak of what *might* be in northern Ellesmere. We now must confine ourselves, for the present at least, to speak of what *was* there. Even negative results may have broader implications for interpreting the prehistory of the Eastern Arctic. These implications will constitute the subsequent points of my report. Briefly, the archaeological chronology of the Hazen Valley and adjacent fiords is as follows:

> The last occupants prior to the 20th Century were Thule Eskimos at the Inugsuk, or Norse-influenced, stage of development. They seem to have made seasonal use of the area and only rarely wintered over. Their subsistence was based primarily on land game (hare, fox, geese, and particularly caribou and musk ox) and only secondarily on sea mammals (seal only — no walrus, narwhal or baleen whale) which they hunted at breathing holes on the ice, rather than from kayaks. In addition to a general Thule assemblage of artifacts, they had unusual amounts of wood, including wooden sled runners of sawed planks presumably acquired from the Norse; and substantial amounts of European iron for knives, ulus, end blades and drills. They collected amber nuggets in quantities from the shore of Lake Hazen, and drilled them for beads. In terms of the admirable chronology established by Holtved[10] at the stratified Comer's Midden in Wolstenholme Fiord they fit into

[10] HOLTVED, Erik, "Archaeological Investigations in the Thule District". *Meddelelser om Grønland,* Bind 141, Kobenhavn, 1944.

the 14th to mid-15th Century A.D. Many of the more distinctive Inugsuk traits of the late 15th and early 16th Centuries are absent here. Such traits are: the distinctive late Thule-Inugsuk side-bladed knife, decorative bodkins, tub staves, long-handled antler spoons, baleen saws, and carved ivory animals. Particularly notable is the lack of baleen, although sled runners and a few tools were made of whale bone.

There is limited, but convincing evidence for an earlier use of the area in about the 11th Century A.D. Sites in Basil Norris Bay on the coast and on the Gilman Delta on Lake Hazen produced such early Thule traits as: scarf-based harpoon sockets, a harpoon head of Mathiassen's Type II, wooden lance sockets, in company with such Dorset traits as a Dorset harpoon head, a fish harpoon head, a three-pronged fish leister with incised line holes, and two composite knife handles of Dorset type, but made of whale bone. There was no evidence in these assemblages, all associated with summer tent rings except for one doubtful autumn house, of a pure Dorset occupation. If anything, the mixture of artifacts, and even mixture of techniques on single artifacts, such as the composite knife handles, seems to add further evidence for the existence of a Thule-Middle Dorset co-tradition in the eastern Arctic. Although no Dorset seriation has been published, it is my impression that the Lake Hazen Dorset artifacts are late in the Dorset continuence. It should be noted that along with the typological evidence for the antiquity of these 11th Century materials was an indication of a warmer and more moist climate than the present one. Archaeological evidence for use of the area prior to the 10th Century rests on one house or tent ring on the Gilman Delta. This round structure of huge boulders was constructed when the vegetation was much thicker than at present, and the melt run-off from the Gilman Glacier was enough greater to raise the lake level three feet. The house was filled with three feet of wind-blown, sterile sand, in contrast to all other house sites where natural deposition was no greater than 4 to 6 inches. Animal bones in the house had almost completely disintegrated, in contrast to the early Thule site on the east side of the delta where bones were still hard, suggesting pre-permafrost conditions. Unfortunately, the only artifact in the house was a single, non-distinctive, end scraper which probably belongs within the Dorset continuum.

No sites have been located more than 6 miles north of Lake Hazen. Along the west coast, south of Eureka Sound, 12 or more sites have been indicated by Sverdrup[11], Thorsteinsson[12] and others, but the only reported artifacts appear to be

[11] SVERDRUP, O.N., *New Lands: Four years in the Arctic Regions.* Longmans, Green. New York and London, 1918.

[12] THORSTEINSSON, R. and TOZER, E.T., "Geological Investigations in Ellesmere and Axel Heiberg Islands, 1956," *Arctic,* Vol. 10, No. 1, 1957.

late Thule. South, along the east coast, Greely and other explorers located sparsely scattered tent rings, but the nearest reported concentration of winter houses is more than half-way down the island in the region of Buchanan Bay.

Here a site, located by Sverdrup and describted briefly by Simmons[13] as "Eskimopolis" was re-located by Lethbridge in 1938[14], partially excavated, and re-named by him "Turnstone Beach". There are 14 winter or autumn houses, three umiak stands and a number of tent rings, meat caches, and fox traps. Significantly, all of the houses are roofed with large whale bones. At least one of the houses at this site is later than the Lake Hazen material, with metal, side-bladed knives, T-shaped-handled ulus, and a carved ivory seal, and one house seems to fall into the early Thule category, with a harpoon blade of Mathiassen's type 1, a float mouthpiece, a Dorset expanded-edge end scraper, and what appears from the illustration to be a partially-ground, burin-like tool. Other material from the site seems to date typologically from the 14th to 16th Century except for one Dorset-like stone lamp and a musk ox horn box bottom.

Lethbridge also collected artifacts from the Carey Islands, between Ellesmere and Greenland, from winter houses roofed with whalebone, which have discrete similarity to the Lake Hazen-Inugsuk material. If anything, the Carey Island Site is later in the 15th Century as indicated by ornamental bodkins, a carving of a polar bear, and a baleen snow beater.

On the southwestern tip of Ellesmere Island, Bentham[15] collected from a number of houses in the vicinity of Craig Harbour. Jenness, in describing the material, attributed it to the 18th Century because of the prevalence of European iron blades. This assessment was made before the quantity of Norse iron from the Greenland Inugsuk sites was known, and it is

[13] SIMMONS, H.G., "Eskimoaernas forna och nutida utbredning Samt dens Vandringsvager," Ymer, Stockholm, 1905.

[14] LETHBRIDGE, T.C., "Archaeological Data from the Canadian Arctic", *Journal of the Royal Anthropological Institute,* Vol. 69, London, 1939.

[15] BENTHAM, Robert and JENNESS, Diamond, "Eskimo Remains in S.E. Ellesmere Island", *Proc. and Trans. of The Royal Society of Canada,* Vol. 35, 1941, pp. 41-56.

now apparent that most of this material belongs in the developed Inugsuk of the 15th to 16th Century. One exception is House J at Craig Harbour which contained a chalcedony burin-like Dorset implement along with early Thule artifacts. Three Dorset harpoon points have also been reported from this locality.

In summary, Ellesmere Island has produced no cultural material pre-dating the developed Dorset of about 500 A.D., and non post-dating the 16th Century.

Just south of Ellesmere Island, on Cape Sparbo, Devon Island, Lethbridge excavated 9 houses, many of them incorporating whale bone in the construction. Artifactual material from these houses included stone, bone, and wood tools of Dorset type, as well as materials from the developed Inugsuk period. Since these typologically early and late materials were mixed in the same houses, Lethbridge was unable to determine whether they represented a mixture of traditions, or a later re-use of early structures. Certainly the relative quantity of Dorset material, points to a greater strength of the tradition here than at any as-yet-discovered site on Ellesmere Island.

Farther to the west, and just south of our arbitrary division of the high Arctic the significant sites on Cornwallis Island excavated by Henry Collins[16] have produced stratified, unmixed, deposits of what he considers to be later (presumably Middle) Dorset types, followed by Thule materials. The Thule component includes a Punuk-Thule element which Collins considers the earliest Thule in the area, but which Holtved, at Ruin Island[17], apparently relates to a later western movement in the 14th Century.

On the west coast of Greenland, north of Latitude 75°, going from south to north, the most significant site is that at the modern settlement of Thule at Wolstenholme Fiord. Here, in Comer's midden, is a stratified sequence beginning with what is apparently middle Dorset; then early Thule; later the arrival

[16] COLLINS, Henry B., "Archaeological Excavations at Resolute, Cornwallis Island, Northwest Territories". Bulletin No. 126 An. Rpt. of the Nat. Mus. of Canada for 1954-1955, Ottawa, 1956.

[17] HOLTVED, Erik, "Archaeological Investigations in the Thule District, Part III, Nugdlit and Comer's Midden." *Meddelelser om Grønland,* Bind 146, Kobenhavn, 1954.

of Norse trade goods at the beginning of the 13th Century. The sequence culminates with the development of Inugsuk until the 16th Century when contact with Upernavik and the major settlements to the south was broken, and the Polar Eskimo were left to develop in isolation until 1818. North of Thule, on Inglefield Land, there is a greater concentration of Dorset materials in the lower levels of middens, but it appears to be a developed Dorset, and there is no separation of a pure Dorset assemblage.

At 81°25′ North Latitude, Lauge Koch in the early 1920's[18], found a square stone house which contained only Middle to Late Dorset materials. In 1958, Eigil Knuth and I spent three hours re-working Koch's excavated material and added one microblade to the assemblage. Five miles north of here, on the shore of the Polaris Promotory, less than 35 miles across the ice of Hall Basin from the fiords of Ellesmere which I had explored, Knuth, in 1958, found a pre- or Proto-Dorset site which he relates to his Independence II culture of northeastern Greenland.

Although I worked on this site at his request, and have seen the materials, I am reluctant to say much about it since I have seen no public announcement of the site from him. It is a site of several houses on a raised beach between two now-dry streams. It contains un-mixed materials which may precede the Sargag assemblage. Meldgaard, who has seen the artifact assemblage, equates it with Independence I[19].

Other scattered sites along the north shore of Greenland have been reported, but the only cultural material described is Knuth's Independence II and the earlier Independence I assemblage which Knuth[20], Larsen, and Meldgaard[21] consider the oldest artifacts in the eastern Arctic. From the same area

[18] KOCH, Lauge, "Report on the Danish Bicentenary Jubilee Expedition North of Greenland 1920-1923". *Meddelelser om Grønland,* Bind 70, Nr. 1, Kobenhavn 1927, p. 177.

[19] MELDGAARD, Jørgen, Personal communication.

[20] KNUTH, Eigil, "Archaeology of the Farthest North," *In Proceedings of the Thirty-Second International Congress of Americanists,* Copenhagen, 1956. Munksgaard, 1958, pp. 561-573.

[21] LARSEN, Helge and MELDGAARD, Jørgen, "Paleo-Eskimo Cultures in Disko Bugt, West Greenland", *Meddelelser om Grønland,* Bind 161, No. 2, Kobenhavn, 1958.

Knuth[22] has reported a late, possibly historic, umiak with associated artifacts.

Working down the eastern coast, Pre- or Proto-Dorset materials, as well as much later assemblages, have been reported from Dove Bay, and farther south on Young Fiord (74° 30′ North Latitude).[23] Thus, in contrast to the one and one-half millenia of culture on Ellesmere Island, both coasts of Greenland share approximately four millenia of cultural development with the Hudson Bay-Foxe Basin area of Canada.

Ordering this data in terms of cultural flow can most properly be done, it seems to me, by reference to the rapidly assembling evidence on paleo-climatology from the disciplines of glaciology, geomorphology, pollen, varve, and ocean sediment analyses coupled with isotopic dating. Admittedly, the evidence from these various approaches is often difficult to correlate, but within the past few years their results seem to be rapidly approaching each other and diminishing the magnitude of their differences.

The major occupation of northern Ellesmere, by caribou and musk ox-hunting Eskimos lasted about a century and a half, from 1300 to 1450 A.D. The major settlement to which they related was on Greenland, in the vicinity of Inglefield Land and Wolstenholme Fiord. Between Ellesmere Island and Inglefield Land is a channel with a strong current, the ice surface is roughened by hummocks, pressure ridges and rafted ice, and there are often open leads even in the middle of winter. However, Eskimos and Europeans have made the sledge crossing without extreme difficulty in the 19th and 20th Centuries. A crossing by kayak or umiak would require considerably warmer summer temperatures than in the present regime. The implication is that for any repetitive movement of people between Inglefield Land and Lake Hazen the winter temperatures would have to be in the general magnitude of current ones, or the summer temperatures considerably warmer. Mean annual temperatures 20 degrees warmer would result in greater ice movement in the channel, and less possibility of crossing by dog sled.

[22] KNUTH, Eigil, "An Outline of the Archaeology of Peary Land," *Arctic*, Vol. 5, No. 1, pp. 17-33.
[23] *Ibid*, p. 31.

The physical evidence from the Hazen Valley and adjacent fiords is that the climate of the 14th and 15th Century was quite comparable to the years 1957-1959. Most occupation sites of the former period are built on the edge of glacial run-off streams and rivers. In two cases on the Gilman Delta there is slight stream erosion of house sites at the July peak-of-melting period, indicating that summer temperatures could have been no warmer than at present. One house on the shore of Lake Hazen has its early floor level at the present high level of the lake. Greater glacial melting would have inundated this house.

The whale bone houses of Buchanan Bay, dating from the 14th to early 16th Century seem to connote the same thermal conditions. Certainly dogs could not haul the masses of heavy bone far, and it is doubtful whether the Eskimos would have transported them by umiak. It seems more probable that these bones reflect the then northern limit of right whale killing, only a few miles north of right whale distribution in the 19th Century.

This period seems to mark the virtual end of Thule expansion through the Arctic. Baltic varve and pollen series, thermal sensitive foraminifera in ocean sediments[24], archaeological evidence from Norse settlements in Greenland,[25] ice and snow borings from the Ellesmere Ice Shelf and T3[26] all tend to indicate deteriorating climates, and increased cold from about the 13th Century to a peak in the mid-18th-Century. At Lake Hazen, a soil contraction crack cutting through House 2 at the Ruggles River Outlet Site between the earliest house floor and the second house floor, and dated typologically to the beginning of the 14th Century, has remained open ever since.

Annual temperatures, and particularly mean minimal and absolute minimal temperatures dropped to such a point that there was a retrenchment of Eskimo settlements and a notable diminution of culture contact across the Arctic. Eskimos of the

[24] WISEMAN, J.D.H., "The Relation Between Paleotemperature and Carbonate in an Equatorial Atlantic Pilot Core", *Journal of Geology,* Vol. 67, No. 6, November 1959, p. 685. And EMILIANI, Cesare, "Pleistocene Temperatures", *Journal of Geology,* Vol. 63, 1955, p. 538.

[25] KOCH, Lauge, "The East Greenland Ice". *Meddelelser om Grønland,* Bind 130, Kobenhavn, 1945, p. 318.

[26] CRARY, A.P., and others, "Evidences of Climatic Change from Ice-island Studies", *Science,* Vol. 122, Dec. 16, pp. 1171-1173.

high latitudes retreated to the Cape York — Inglefield Land vicinity where mean temperatures today, due to an extension of the Gulf Stream system, are 20 degrees[27] higher than across the channel on the Ellesmere side, and 30 degrees higher than on Lake Hazen.[28]. Absolute minimum temperatures of minus 70° F. as have been recorded at Lake Hazen would be intolerable under the conditions of native life (121 days – 40 and below, 73 days – 50 and below — Lake Hazen 1957-1958). In general, the eastern Eskimos retreated to three main regions south of the mean January – 30° F isothermal line — leaving the Polar Eskimo in the Cape York vicinity, cut off from the more southerly Greenland settlements by Steenstrup's Glacier, storis, and rough ice, and the Central Eskimo in the southern Canadian Arctic.

Turning to an earlier period, the initial spread of the Arctic Small Tool Tradition, it is growing more apparent, on the basis of C14 dating, that the initial spread of this tradition took place just after the Altithermal — from 2000 B.C. to 1500 B.C.[29] Although Hopkins[30] states that this Climactic Optimum had little effect on the Alaskan littoral, geomorphological work in northern Ellesmere Island and Polaris Promontory, and pollen analyses in Western Greenland indicate that the reverse was true for the Eastern Arctic. Evidence from the northeastern flood plain of Lake Hazen and the deltas along the fiords indicates a tremendous discharge of melt-water at this time. Whether because of eustatic, or isostatic adjustment, and probably due to both, the sea level at this time stood 30 feet higher in northeast Greenland, 90 feet higher on Polaris Promontory, and 150 feet higher in

[27] HOGUE, Donald W., *Temperatures of Northern North America. Research Study Report RER-9,* Environmental Protection Research Division, Quarter-master Research and Development Center, US Army, Natick, Mass., June 1956.

[28] JACKSON, C.I., *Operation Hazen: The Meteorology of Lake Hazen, N.W.T. Part I, Analysis of the Observations, Arctic Meteorology Research Group,* McGill University, Montréal, Publications in Meteorology, No 15, Defence Research Board, Department of National Defence, Canada, 1959.

[29] MASON, Ronald J., *Late Pleistocene Geochronology and the Paleo-Indian Penetration into the Lower Michigan Peninsula.* Anthropological Papers, Museum of Anthropology, University of Michigan, No. 11, Ann Arbor, Mich. 1958.

[30] HOPKINS, David M., "Comments" in Giddings, J.L., "The Archaeology of Bering Strait", *Current Anthropology,* Vol. 1, No. 2, March 1960, p. 137.

Foxe Basin. The vicinity of Disco Bay, at least, had a relatively warm, continental climate.[31] In spite of fluctuations in temperature and precipitation, the evidence from Scandinavian varves and pollen, Greenland pollen, and Atlantic foraminifera[32] indicates that not until 400 to 500 A.D. were climates comparable to the present cold ones.

This can only mean, ruling out the independent development of amazingly similar cultures, that the spread of this Arctic Small Tool tradition was by boat. In three successive February's (1955, 1956, and 1957), I made aerial ice surveys between the 60th and 70th parallels from Cape Dyer, Baffin Island to Cape Lisburne, Alaska. In these flights I was amazed to see how large, open leads in the sea ice prevented much dog sled travel, let alone travel with small, hand-drawn sleds. In those three February's with temperatures in the minus forties, it would have been impossible to travel by sea ice to Southampton Island; across Foxe Basin, or the Hudson Straits; to Mill Island; across Hudson Bay, and, I am certain, out to Coats and Mansel Islands,* although I did not observe the latter two, or to Greenland at any point south of 78° North Latitude. Obviously, the possibility of such travel in warmer periods is ruled out completely.

If we allow these Pre- and Proto-Dorset people to travel by boat we can see a spread of culture from west to east, through Hudson Strait and along the coast of Baffin Island to Button Point. The crossing to Greenland was probably not made much south of Thule; the shortest distance between the two islands south of this is 206 miles, and the current runs counter to such a journey. From here there may have been a spread of culture both north and south, with traces of the southerly spread possibly covered by the later advancing glacier along Melville Bay, or a movement down the west coast through Disco Bay and Egedesminde and up the east coast through Angmagssalik, Scoresby Sund, Young Fiord and Dove Bay to Independence Fiord.

[31] LARSEN, Helge and MELDGAARD, Jørgen, *op. cit.*, p. 22 ff.
[32] WISEMAN, J.D.H., *op. cit.*
* I was advised by Ivugivik Eskimos that sled trips between Mansel Island and Cape Wolstenholme occurred in sufficient number in this century to occasion no surprise. Because of poor ice conditions the trip has been known to require as many as five sleeps. W. E. Taylors, Jr.

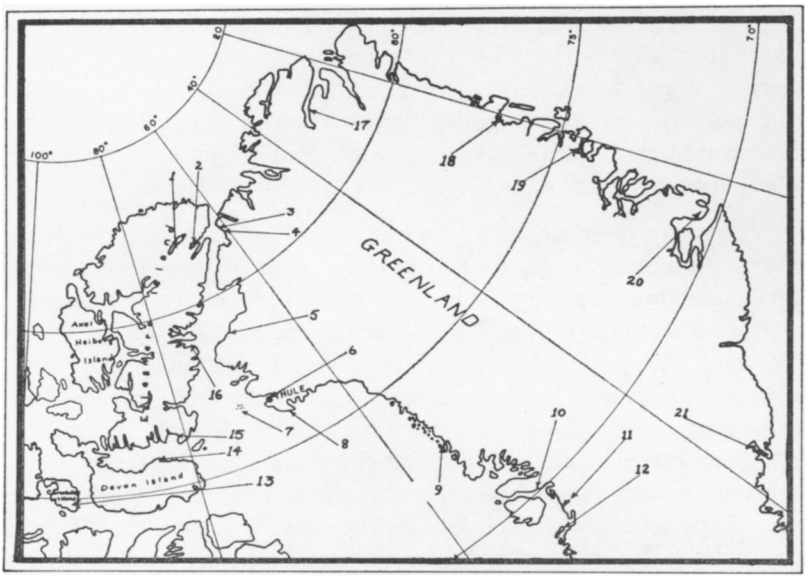

FIGURE 1

Legend — *Archaeological Sites of the High Arctic.*

1 - Lake Hazen — Developed Dorset, Thule and Inugsuk.
2 - Coneybeare Bay — Developed Dorset, Thule and Inugsuk.
3 - "Atka River" site (Eigil Knuth) — Pre-Dorset.
4 - Lauge Koch Site — Developed Dorset.
5 - Inglefield Land — Developed Dorset and Thule.
6 - Thule — Developed Dorset, Thule and Inugsuk.
7 - Carey Islands — Inugsuk.
8 - Cape York — Inugsuk, Polar Eskimo.
9 - Upernavik — Thule, Inugsuk, West Greenland Eskimo.
10 - Sarqaq — Pre-Dorset.
11 - Sermermiut — Pre-Dorset, Developed Dorset.
12 - Egedesminde — Pre-Dorset.
13 - Cornwallis Island — Developed Dorset, Early Thule, Developed Thule.
14 - Cape Sparbo — Developed Dorset, Tsule, Inugsuk.
15 - Craig Harbour — Developed Dorset, Thule, Inugsuk.
16 - Buchanan Bay (Turnstone Beach) — Developed Dorset, Thule, Inugsuk.
17 - Independence Fiord — Pre-Dorset.
18 - Dove Bay — Pre-Dorset.
19 - Young Fiord — Pre-Dorset.
20 - Scoresby Sund — Pre-Dorset, East Greenland Eskimo.
21 - Angmagssalik — Pre-Dorset, East Greenland Eskimo.

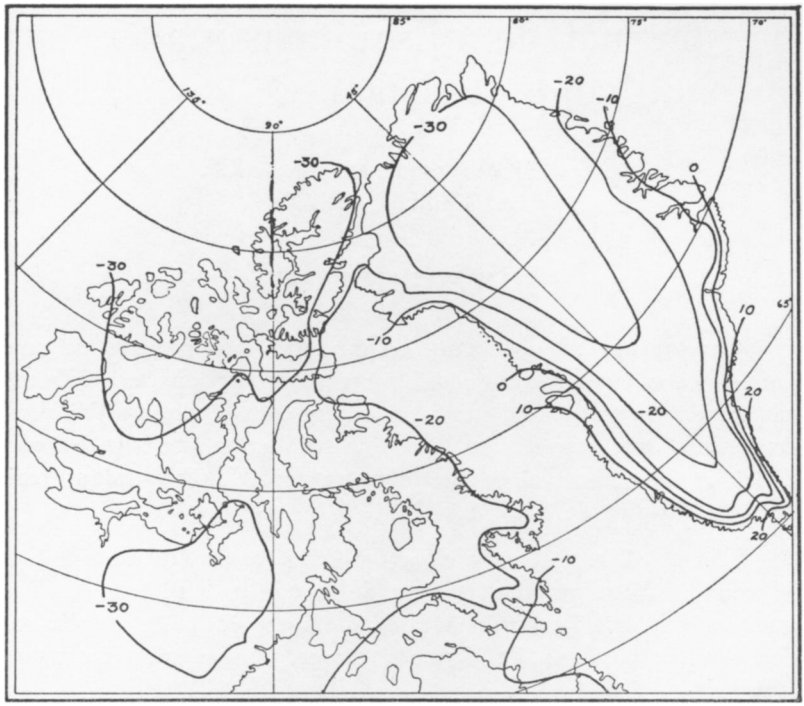

FIGURE 2

Mean January Temperature (°F.) of the Eastern Arctic after — Hogue, Donald W., Temperatures of Northern North America, Environmental Protection Research Division, Research Study Report RER-9, Hq. Quartermaster Research and Development Command, U.S. Army Natick, Mass., June 1956, fig. 2.

Whatever the pattern of migration and diffusion in Greenland, northern Ellesmere Island does not appear to have played a significant role in the initial spread of the Arctic Small Tool Tradition. In part, this is because the major northward movement of culture was along the comparatively warm shores of Baffin Bay, rather than through the western islands, and in part because, with the sea-land relationship 50 to 90 feet higher, the steep eastern shores of Ellesmere offered few level areas for extended settlement in contrast to much of the northern littoral of Greenland.

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