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5 *Inuksuk, Sled Shoe, Place Name*

Past Inuit Ethnogeographies

Peter Whitridge

Abstract

Inuit households moved through a complex and far-flung annual round, and individuals travelled even more widely, in pursuit of game and other resources, for trading opportunities and social contacts, to learn about the local landscape and monitor its changes, and as part of an ongoing personal, spiritual engagement with the world. The *igliviak* or snow house so emblematic of Eastern Arctic groups—a sophisticated winter travel structure that required practiced skills and technical environmental knowledge, though little in the way of equipment or raw materials beyond a snow knife and a snowdrift—neatly embodies this style of land use. In fact, a capacity for mobility was embedded in virtually every facet of Inuit culture. Portable travel technologies (including situational ones, assembled on the spot like the *igliviak*) involved an elaborate array of seasonally appropriate vehicles (including domesticated animals to provide traction), tools, clothing, knowledge and skills. Durable place markers—*inuksuit*—oriented travelers as they moved along trails or followed learned travel routes, and a network of semantically-dense place names archived spatial and historical information in a readily memorable form. The rapidity and spatial scale of Inuit exploration and colonization during the first few centuries of expansion out of the western Canadian Arctic (roughly AD 1200–1500) are particularly exceptional. The archaeological record reveals a sophisticated body of travel technologies and epistemologies—an Inuit ethnogeography—that have continued to evolve as novel things and practices (motorized transport, telecommunications, GPS, etc.) have been taken onboard. Travel remains at the heart of Inuit culture.

Key words: Inuit, mobility, *inuksuk*, travel, technology, navigation

INTRODUCTION

We all travel—after all, evolution has selected the human body for long distance walking and running—but precontact Inuit of the Eastern Arctic more than most.

Ancestors of the Inuit appeared suddenly in the Bering Sea region around 1500 years ago, the advance guard of an expanding Eurasian world system (Mason 1998), and then proceeded to colonize much of the North American Arctic over the ensuing millennium. This entire period is characterized by a relentless territorial expansion that was only brought to a halt in southern Labrador when Inuit encountered equally expansionist, but even better equipped, Europeans, closing the global circle once and for all. We think of the Arctic as bleak, and admittedly it can be. But amidst the barren *fjeldsmeer* and expanses of frozen ocean there are patches of life: moist tundra meadows, polynyas teaming with marine mammals. These are the places where people lived and hunted. To find their way from place to place through the changing seasons Inuit relied on an array of sophisticated navigational technologies.

Making a living in the north meant not just a practiced 'mobility', as it always has for hunter-fisher-gatherers everywhere, but often a kind of hypermobility that is virtually unequalled among such groups. Inuit households frequently moved through a complex and far-flung annual round, and individuals travelled even more widely, in pursuit of game and other resources, for trading opportunities and social contacts, to learn about the local landscape and monitor its changes, and as part of an ongoing personal, spiritual engagement with the world. The *igluviak* or snow house so emblematic of Eastern Arctic groups—a sophisticated winter travel structure that required practiced skills and technical environmental knowledge, though little in the way of equipment or raw materials beyond a snow knife and a snowdrift—neatly embodies this style of land use. In fact, a capacity for mobility was embedded in virtually every facet of Inuit culture. Portable travel technologies (including situational ones, assembled on the spot like the *igluviak*) involved an elaborate array of seasonally appropriate vehicles (including domesticated animals, i.e. dogs, to provide traction), tools, clothing, knowledge and skills. Durable place markers—*inuksuit*—oriented travelers as they moved along trails or followed learned travel routes, and a network of semantically-dense place names archived spatial and historical information in a readily memorable form. Although the most ancient place names and other immaterial technologies are lost, more recent ones (some, on the documentary evidence, at least several centuries old) survive, as well as a thick record of the material technologies, frequently preserved in permafrost. All of these tools and techniques were put into play in a world that was already overwritten with a history of human occupancy, beginning with Paleoindian and Archaic groups along its southern fringes and culminating, before the Inuit arrival, with the expansion of Arctic Small Tool tradition (ASTt) groups throughout the Arctic some 4500 years ago (Raghavan et al. 2014).

Inuit employed an elaborate array of features, things, bodies, practices and knowledges in the course of settling and inhabiting the North. The rapidity and spatial scale of Inuit exploration and colonization during the first several centuries of expansion out of the western Canadian Arctic (traditionally referred to as the Classic and Modified or Developed Thule periods, but here simply as 'Classic' and 'late' precontact Inuit; see Whitridge *in press*), and the flexible annual cycles that were initiated locally, are particularly exceptional, and anchor the following discussion. The archaeological record reveals a sophisticated body of travel technologies and epistemologies—an Inuit ethnogeography—that have continued to

involve as novel things and practices (motorized transport, telecommunications, GPS, etc.) have been taken onboard. Travel remains at the heart of Inuit culture.

INUIT TRAVEL AND MOBILITY

All Inuit (used here as shorthand for closely related North Alaskan Inūpiat, Inuvialut of the Canadian Western Arctic, Inuit of the Canadian Eastern Arctic, and Greenlandic Kalaallit) can be considered to have been highly mobile, though they were so in different ways and to differing degrees, depending especially on the structure of the local environment and the manner in which people elected to use it. Of course, the physical and biotic environments themselves have not been stable over the roughly 1500 years that Inuit-related groups have occupied northern North America, and local groups have local histories that include changes in the way they seasonally distributed themselves across the landscape in the course of making a living and interacting with each other. These local histories are thoroughly entangled with the environmental ones, but are not reducible to them. The very arrival and spread of Inuit throughout the North American Arctic, in many areas supplanting ASTt-descended groups who had occupied the land for millennia, is one of those things that is not environmentally given. Inuit economic, social and epistemic styles distinguish them from ASTt, and in many respects are bound up with the distinct way Inuit conceived of, and equipped themselves for, movement through the landscape.

Structure of the Arctic Environment

In general, the Eastern Arctic placed greater mobility demands on its inhabitants than the Western Arctic. Plant resources are scarce, and the marked seasonal swings in snow and ice cover, temperature, daylight, and vegetation have dramatic effects on its fauna. The major terrestrial game species, caribou, is migratory over much of its range; wintering and breeding grounds are typically several hundred kilometers apart. Even the more sedentary High Arctic subspecies (*Rangifer tarandus pearyi*) has a large seasonal range, and local populations may occasionally, and quite rapidly, abandon one of the large islands of the Canadian Arctic Archipelago for a neighbouring one tens or hundreds of kilometers distant (Ferguson and Messier 2000). Island populations of the other large herbivore, muskox, exhibit similar dramatic range shifts. Many resident terrestrial species hibernate, and tend to be small, lean and sparse in any case. Most economically attractive birds are only seasonally present, and the most valuable fish species are superabundant at predictable locations once or twice a year, when they are spawning or moving between lake and ocean; only a few (arctic char, burbot, lake trout) are accessible in some regions for much of the year. Many of the important marine mammal species (bowhead whale, Atlantic walrus, beluga, harp seal) which anchored precontact arctic economies are also migratory, and even the resident ones (ringed and bearded seal, polar bear—the latter is particularly mobile, but not migratory) exhibit marked changes in seasonal behavior and localization due to the formation, accumulation and decay of sea ice over a nine to ten month cycle. Select areas, especially polynyas (areas

of recurrent open water and/or a reduced period of sea ice cover), may experience a number of moderate animal population booms over a normal year (Schledermann 1980), but the Eastern Arctic lacks the spectacular resource hot spots that allowed some Western Arctic groups (e.g., Mackenzie Delta Inuit, the Ulivokmiut of King Island) to remain virtually sedentary. For the most part faunal resources were migratory and/or patchy, and the conditions under which they could be harvested (e.g., dense aggregations, a stable sea ice hunting platform) transitory, necessitating that arctic hunter-fishers themselves be mobile, and tactically flexible. Many of the characteristic elements of Inuit technology relate specifically to these demands.

Migratory Origins

Although the relationships between pre-existing Norton and Ipiutak groups in western Alaska (traditionally, "Paleoeskimo") and the Old Bering Sea, Birnirk and Punuk ones that introduced Inuit (traditionally, "Neoeskimo") cultural elements into the Bering Strait region are difficult to resolve, the situation is simpler in the Eastern Arctic. There, groups assigned to the Late Dorset cultural tradition occupied large tracts of the Canadian Arctic Archipelago and Greenland, and parts of the arctic mainland, though at low population densities. Suggestions of a prior late Middle Dorset settlement collapse beginning around AD 700–800 occur in some areas (e.g., Newfoundland and Labrador, Renouf 2011). An exploratory "Pioneering Thule" (Arnold 1986; Morrison 1999; Whitridge 1999) movement of Inuit groups from the Mackenzie Delta/Amundsen Gulf region into the Central and High Arctic in the later twelfth century was followed around AD 1200 by a major surge of Inuit settlement in the latter areas that is recognized archaeologically as "Classic" precontact Inuit. Surviving Late Dorset groups disappear shortly thereafter (Friesen 2005). Although Inuit were not the first colonists anywhere in the Eastern Arctic, much of it appears to have been sparsely and/or intermittently occupied by descendants of Arctic Small Tool tradition groups, and vacant when Inuit arrived.

At least one distinct migration branch (the "Ruin Island Phase") brought North Alaskans with a Punuk-like material culture into the Canadian High Arctic and Greenland in the mid-thirteenth century. The initial stages of both the Amundsen Gulf-Central Arctic and Ruin Island events appear to have been rapid. Ruin Island assemblages from eastern Ellesmere Island include objects apparently manufactured more than 4000 km away in North Alaska (e.g., a coal labret, Barrow Curviliner pottery; McCullough 1989), and assemblages from southeastern Somerset Island have precise stylistic matches at Cape Parry (Whitridge *in press*), some 1700 km to the west. Inuit expansion into Foxe Basin, Baffin Island, Hudson's Bay, the Barrengrounds, northern Quebec-Labrador, southern Greenland and East Greenland was achieved over the next 500 years, likely inhibited in some areas by the presence of resident populations (ancestral Dene on the Barrengrounds, ancestral Innu in northern Quebec-Labrador), and in others by the vast distances involved (another 3300 km to the Angmagssalik area of East Greenland from Nares Strait).

The speed with which Inuit occupied the Eastern Arctic is incredible, analogous in scale and technical complexity to the Paleoindian colonization of the Americas

(Anderson and Gillam 2000) or the Polynesian colonization of the islands of the central and eastern Pacific (Wilmshurst et al. 2011). Like the latter, pioneering Inuit possessed fast and reliable transportation aides, superb navigational skills, and an economic template that was sufficiently flexible to accommodate substantial ecological diversity. They must also have possessed a similar aptitude and inclination for exploring and colonizing new territories. The clear precursor for the colonization of the Eastern Arctic was the colonization, successively, of the Bering Sea coasts by Old Bering Sea groups, North Alaskan and Chukotkan ones by Birnirk, and Beaufort Sea-Amundsen Gulf ones by Early Thule. The Classic colonization of the east was simply the continuation of a pattern that had begun in northeast Asia in the mid to late first millennium AD, though one that is better resolved than the latter episodes due to the preservation of the record along isostatically emergent coastlines. We can only infer a deeply rooted cultural template for travel, fostered by a seemingly endless encounter with economically attractive, but demographically vacant or lightly used, territories. Of course, this assumes that precontact Inuit economy was actually adequate to the challenges that were encountered, and that groups were able to construct and maintain durable social networks and deploy effective knowledge practices. These topics are turned to below.

Economy

Inuit did not colonize such a vast area without encountering novel local ecologies. Interior regions with rich caribou stocks and freshwater fish but no sea mammals, or insular coasts with sea mammals and birds but no caribou, required adjustments to the harvesting mix and schedule, and the establishment of reliable trading relationships with differently-supplied neighbors (McCartney 1991; Whitridge 2002a; Friesen 2012). Some of the technologies specifically associated with the travel component of these practices (watercraft, dog-drawn sleds, navigational cairns) are discussed in more detail below. Here attention is drawn to the harvesting equipment and storage devices that allowed diverse resources to be procured under widely varying conditions and preserved for later.

Although Inuit possessed some multi-use harvesting equipment, such as bows and lances, a more striking feature of the Inuit toolkit is its diversity (Oswalt 1976). Harpoons were calibrated for open water and sea ice, for throwing and thrusting, and for prey varying in size from small seals to large baleen whales; one size did not fit all. Particular arrow types were employed for caribou, birds and even fish. An enormous array of gear was used over the course of an annual round, so much in fact that seasonally specialized equipment had to be cached at winter villages or points of debarkation between land and sea ice (see the discussion of historical seasonal rounds in various parts of the Eastern Arctic in Damas 1984). Some harvesting devices were also more or less permanent. Upright boulder food caches and deep pits dug into gravel beach ridges for drying, storing and fermenting game could occur in huge numbers, such as along the bowhead whaling coasts of southeastern Somerset Island (Savelle 1987, 2010).

Lines of stone cairns, called *inuksuit* (sing. *inuksuk*, literally “to act in the capacity of a person”; Hallendy 1994, 2000), formed caribou drive systems, associated with blinds, shooting pits and pounds at the envisioned destination (Brink 2005). Analogous stone walls converging on a circular pen—*sapuitit*—were set in the shallow water of streams to trap char ascending to their wintering lakes. Baited, beehive-shaped stone cairns were erected as fox, and perhaps even wolf, traps along those animals’ paths of regular movement. In each case the seasonal travels of a prey species were anticipated, monitored and artificially aligned with human harvesters, who were themselves mobile, their movements carefully adjusted across a seasonal round to intercept the movements of their prey (Whitridge 2013).

Society

Inuit families assembled into groups that spent at least part of the year together—often fall, for major harvesting efforts targeting caribou or whales, and winter, for sealing or jointly living off the fruits of the fall harvest. A nuclear or slightly extended family typically occupied a tent (*tupik*) in summer, sometimes a *qarmat* (tent with foundation) in fall, and a sod house (*iglu*) or snow house (*igluviak*) in winter. Many precontact sod winter houses have two (less often three) sleeping platforms, each of which presumably housed the occupants, at other times, of a tent, *qarmat* or snow house. Simpler shelters were employed by lone travelers, and enlarged sod houses with as many as 50 occupants become common in the early historic period in Greenland and Labrador (Lee and Reinhardt 2003). Specific sod houses and *qarmats* were refurbished and reused year to year, whereas tent and snow house locations were highly variable (in fact, snow houses were often constructed on seasonal sea ice). Even sod houses, however, were constructed of local materials (stone, turf, hide and driftwood or whale bone) and could be erected in a short period of time as the situation demanded. All of these structures could be assembled into clusters and settlements of widely varying sizes depending on the scale of communal enterprise that different harvesting tactics mandated, with corresponding implications for the intensity and complexity of social interaction (Savelle and Wenzel 2003). Most social difference hinged on gender and age, but seasonal residence in large extended-family house groups was associated with differences in wealth, economic specialization and social influence. Mobility was linked to gender, age, and status in various ways. Ethnographically, individual families might travel widely, but aside from foraging and play close to the community only adult males typically travelled alone or in non-family groups. Harvesting would have frequently taken men away from the household and community for days at a time, and so travel, with all its implications for the acquisition of esoteric knowledge, was a disproportionately male activity. Given that the number of dogs one could support was closely tied to household economic production, and watercraft were demanding to build and maintain (in time and materials), wealth or status can also be considered a determinant of mobility.

Knowledge and Belief

Knowledge was both a prerequisite for, and product of, travel. In the first place, travel demanded a cartographic-style recall of topography, harvesting locales, local environmental conditions, and seasonally variable travel routes (Whitridge 2004). Individuals would have begun to learn these things as children moving about the landscape with their families, and on dedicated harvesting trips with adults. Personal experience would have been supplemented with information gleaned from others through tales, news, and dedicated instruction. By adolescence individuals were hunting on their own, acquiring increasingly varied practical experience, and supplementing the knowledge acquired from others with novel observations. As adults Inuit travelled extensively for harvesting, trade, social interaction, and the deliberate acquisition of environmental knowledge. Recitation games that revolved around the memorization of regional toponyms (Correll 1976) illustrate the degree to which geographical knowledge practices were routinized from childhood on, and transmitted as redundant mnemonic devices.

Besides a concrete knowledge of the regional landscape individuals acquired a flexible set of technical skills that endowed them with the improvisational competence to move through novel settings, or through known settings under novel conditions. This included the ability to manufacture and deploy a host of harvesting and travel technologies (discussed below), as well as understandings of such things as animal behavior, open ocean and sea ice characteristics, weather, astronomical navigation, and the deliberate and incidental signs of other human activity. Travel was also an important component of spiritual life. Myths and tales often centered on the travels of humans and non-human beings, personal magic was acquired on solitary journeys, and travel was a core feature of the *angagok*’s (shaman’s) magico-ritual practice (Saladin d’Anglure 1993; Oosten 1986; see Oetelaar 2016, this volume, on the analogous importance of myth and magic to Plains landscape knowledge practices). In the Eastern Arctic this typically involved out-of-body journeys, often through the medium of a spirit familiar, to check on the activities of distant enemies or pay a conciliatory visit to the deity at the bottom of the ocean who controlled the abundance of animals (Sonne 1990). *Isuma*, wisdom, was a product of knowledge acquired, and skills refined, over a lifetime of travel.

PORTABLE TRAVEL TECHNOLOGIES

Alongside the macroscale distribution of sites and features across the landscape, not considered in detail here, archaeological evidence for the particular character of Inuit mobility takes a number of forms, including recovered components of a portable travel technology, constructed features that oriented and otherwise facilitated travel, the paths along which travel sometimes proceeded, and representations (depictions of travel, maps) supplemented by contact-era records of place names. The portable material record, outlined below, includes vehicle parts (and associated features), remains of draft animals, tools employed in the course of travel, a sophisticated clothing technology, and features related to shelter while in transit.

Vehicles

The rapid Inuit colonization of the Eastern Arctic, and associated exclusion of pre-existing Dorset populations, was in part made possible by a set of vehicles for travel over water and snow that were part of the ancestral toolkit possessed by Old Bering Sea and later Inuit-related groups (Collins 1937). Two principal varieties of watercraft served markedly different functions (Petersen 1986). The *umiak* is a large open skin boat, consisting of bearded seal or walrus skins stretched over a wood and rawhide frame (Braund 1988). It was employed for hunting large sea mammals in open water, principally bowhead whale and walrus, and for transporting groups of people and their gear during summer travels. The former use is represented in depictions of whaling in precontact art (McCartney 1980), while the latter is inferred from abundant ethnographic documentation. In the Eastern Arctic the kayak is a single person craft with a covered hull and an opening for the paddler that can be sealed off by tightening a drawstring in the kayaker's suit around the cockpit coaming (Petersen 1986). Kayaks were employed for hunting small marine mammals, birds and swimming caribou (e.g., Whitridge 2013), and to support *umiak* crews in whaling (as depicted on a precontact drillbow; Maxwell 1983). Besides a remarkable complete fifteenth century *umiak* frame (and nearby paddle) recovered in Peary Land, northern Greenland (Knuth 1952; Grønnow and Jensen 2003), boat parts are rarely identified in Inuit assemblages, in part because their skin coverings and large wooden elements were heavily recycled, but also because researchers have failed to recognize them. Jenya Anichenko (Anichtchenko 2012; personal communication 2015) has promisingly identified boat parts in reanalyses of a number of archaeological collections. Bone guards from the tips of kayak paddles have been recovered (Kaplan 1983), and crude models of boats, both kayaks and *umiaks*, that likely functioned as toys are common (Park 1998). Walls (2012) presents archaeological evidence, in the form of kayak-shaped cobble outlines, of a terrestrial kayaking game that provided training for hunters out on the water. Kayaking is inferred to be the principal cause of some of the osteoarthritis ("kayaker's clavicle") observed on precontact and historic remains from northwest Hudson's Bay (Merbs 1983). Boats are also implied by the specialized harvesting gear employed from them (a variety of open water harpoons, lances, spears and floats) and abundant zooarchaeological evidence of open water hunting (e.g., Savelle and McCartney 1994).

The other important variety of vehicle was the heavy sled, or *komatik*, pulled by a fan of five or more dogs, by people, or by both in combination (Figure 5.1). It consisted of two runners made of wood or whale bone with a series of cross pieces of similar material that were loosely fastened to the runners, allowing the sled to flexibly deform as it passed over ridges and hummocks (Atagutsiak 1991a; Nunavut Bilingual Education Society 2006). The runners were protected from contact with the ground surface (usually snow or ice) by a series of rectangular bone, ivory, antler or baleen "shoes" pegged to the base. Worn sled shoes, and the cylindrical wood or bone pegs that fixed them to the runner, are common archaeologically, and the shoes often exhibit masses of use striae of varying depth and orientation

(Figure 5.1). Cross pieces also occur, but the large runners themselves were presumably recycled as they rarely survive on habitation sites in recognizable form (an unfinished bowhead mandible runner occurred in a precontact house at Port Leopold, on northeast Somerset Island; Whitridge 1992: 35). Savelle and Dyke (2014) have recently described a large number of precontact *komatik* parts (antler shoes and wooden cross pieces and runners), including three essentially complete *komatiks*, identified during extensive offsite surveys of southwestern Victoria Island. The bowhead whale mandibles that framed Classic precontact Inuit (ca. AD 1200–1500) winter houses in many parts of the Eastern Arctic (Savelle 1997; Whitridge 2002b) were widely scavenged for sled runners in the late precontact and historic periods (McCartney 1979), as Inuit were becoming even more mobile participants in the commercial trapping economy (Savelle 1987). The cycling of whale mandibles through house frames, sled runners and, eventually, carvings for the Inuit art industry is one of the signature taphonomic processes along the whaling beaches of the central Canadian Arctic, as reflected in the ubiquitous mandible stubs projecting from sod house foundations (see McCartney 1979). A less common variety of light utility sled that was likely hand pulled was made from several slabs of baleen stitched in a fan about one meter long (Whitridge 1999). In the absence of baleen, walrus, bear or caribou hide sufficed for the same purpose historically (Mathiassen 1927: 62). A bioarchaeological trace of *komatik* use is suggested by the heavy incidence of vertebral pathologies in Merbs' (1983) northwest Hudson's Bay skeletal series, attributed to riding *komatiks* over hummocky ice and rough ground.

The value of these devices to mobile northern hunters should not be underestimated, as they enabled rapid maritime travel at most seasons with large cargoes of people, food, gear and portable shelters (the period of late fall freeze up was the only time that travelers were confined to land). Their persistence into modern times illustrates their utility. Globally, open skin boats were widely distributed in earlier centuries, but the Inuit kayak's distinctive closed hull, double-bladed paddle, and cockpit skirt have been widely emulated for recreational watercraft worldwide. The *komatik*, meanwhile, has remained in everyday winter use in much of the Eastern Arctic (and beyond; Firestone 1992), with only its whale bone shoes replaced by plastic and sheet metal, and leather bindings by nylon rope. The dogs that usually pulled *komatiks*, however, have been replaced for most purposes by snowmobiles.

Draft Animals

The dog, the only Inuit domesticate, was a crucial navigational aide (Atagutsiak 1991b; Laugrand and Oosten 2002). Travelers had to monitor animal behavior, clouds, wind and sea ice, and understand the schedules on which many of these things varied. The ability to track these signs was enhanced by the distinct sensory skills of dogs. Working with a dog involved not only teaching it how to accommodate itself to human technologies (like the *komatik*) and practices (such

as bear hunting), but learning how to read the signs of its canine knowledge of distant sounds and smells that humans could not detect. Humans and dogs trained each other. Dogs were important for certain kinds of hunting (scenting ringed seal breathing holes, bringing polar bears to bay, forcing muskoxen into their defensive circle) and as watchdogs, and occasionally eaten as a starvation food, but the most important contribution of the Inuit dog in the past appears to have been as a draft animal. Teams of dogs pulled laden *komatiks*, typically at human walking speeds, and in summer individual dogs may have been loaded with gear and supplies in panniers, as they were historically (Atagutisq 1991b). Besides the indirect evidence of *komatik* parts, whale bone, ivory or antler buckles that are identical to historical varieties used to fasten the dog trace to the *komatik* are common finds (Figure 5.1), sometimes eroded by the digestive acids of a non-team player. Toggles used to fasten the dog's harness and trace have rarely been identified (Mathiassen 1927: 63), perhaps because they are difficult to distinguish from similar toggles used for a wide variety of purposes. The distinctive solid bone or wood handles of dog whips are present archaeologically, and occasionally portions of the lash (e.g., McCullough 1989: 133–135), but the harnesses that each dog wore, and panniers like historical ones, have not been identified, though the former, at least, are likely present in fragmentary form (interestingly, Jenness 1946: 138–139 illustrates both dog and human variants of the sled-hauling harness).

Dogs themselves occur consistently in Inuit assemblages (e.g., Savelle and McCartney 1988), their relative abundance presumably tracking their relative importance. Pathologies reflecting their use as draft animals (osteoarthritis, musculoskeletal stress markers) and human discipline (cranial fractures) have been reported, and cut marks, element frequencies and fracture patterns reflect their consumption (Park 1987; Brown et al. 2013). Dog fur was utilized historically, so some of the processing marks are likely due to skinning. Dogs figure in precontact incised figurative art (Maxwell 1983) and foundational Inuit myths (e.g., the widespread tale of the dog who is married to the future sea goddess, and fathers the ancestors of all non-Inuit peoples; Rasmussen 1929: 63–64), and individual dogs were named (Laugrand and Oosten 2002) and coddled as puppies. These contrasting practices and beliefs suggest that dogs had a decidedly ambivalent status in Inuit culture (Laugrand and Oosten 2002). While conflated with other animals as a source of raw materials and food, their roles as hunting aides and, especially, mutually cooperative suppliers of *komatik* traction, clearly set them apart from the rest. The latter function is one of the key features differentiating Inuit travel technology from that of earlier occupants of the Eastern Arctic, who kept dogs in much smaller numbers (Morey and Aaris-Sørensen 2002; Brown et al. 2013) and possessed only small, hand drawn sleds (Wells and Renouf 2014). Although maintenance of dog teams demanded a significant escalation of the food harvest at all seasons, the dramatic increase in winter mobility enabled by the driver-dogs-*komatik* actor-network proved decisive for Inuit expansion and displacement of Dorset groups.

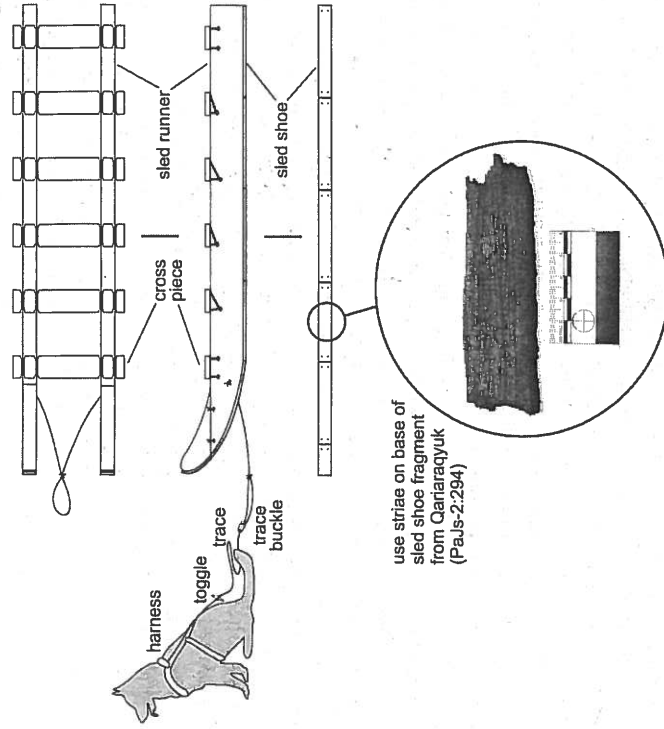


Figure 5.1 Suggested reconstruction of a precontact Inuit *komatik*; the detail shows use striae on base of sled shoe fragment from Qariaraqyuk, Somerset Island (PaJs-2: 294). Photo and composition by the author.

Tools

The full complement of equipment used by adults over the course of an annual round would have been difficult for a family to transport. Early twentieth century photographs of a Copper Inuit community on the move in wintertime show a train of laden *komatiks* that dwarf the humans and dogs pulling them (Jenness 1922: 117–118), and precontact household assemblages were likely even larger. However, precontact settlement systems incorporated sod winter dwellings that were absent in the Copper Inuit area, and many other parts of the central Canadian Arctic, historically. Sod houses were often substantial multi-family structures, with internal storage compartments and alcoves, elevated outdoor racks for securing equipment and watercraft from dogs, and below-ground storage pits for food. Much as historic groups cached seasonal gear on the coast when moving between land- and sea ice-based segments of a mobile annual round, precontact travel would have drawn clothing, food and utensils as necessary from the stores housed at these logistical nodes.

Most of the extensive harvesting toolkit was designed for use on the road, in pursuit of mobile prey, and represents merely the Inuit branch of a long-running Beringian design trajectory premised on portability. Some pieces of equipment, however, constitute distinctive accommodations to mobility in the far north. Diminutive oil lamps were used by hunters and other travelers, and many men's knives are pierced at their proximal end for suspension from clothing, so they would not be lost when traveling or working outdoors in messy or snowy conditions. This applies not only to the heavy duty end-slotted knives that were likely associated with especially sloppy activities like primary carcass processing outdoors, but even to the relatively delicate crooked knives designed for fastidious craftsmanship while at rest. That women's knives (*ulus*), scrapers and sewing kits lack this simple device implies different contexts of transportation and storage, and presumably a reduced expectation of outdoor loss. A complex of tools was also associated with the creation of winter shelter while traveling. Slender whale bone rods with separate ferrules and proximal knobs were used to test the consistency of snow for a snow house (or probe the outline of a seal breathing hole), and a snow knife, a 30–40cm long curved bone, ivory, horn or antler blade with a rounded tip and integral handle, for cutting the blocks that composed it. An intriguing variety of material culture that is documented ethnographically but not archaeologically is the portable constructed map (e.g., Spencer 1955; Peterson 1984; Franceschi et al. 2001). Unlike ephemeral maps sketched in snow and sand, or assembled as models with pebbles and twigs (Spink and Moodie 1972), these wood and hide depictions of coastline could have accompanied the traveler and been passed hand to hand, both among contemporaries and inter-generationally, representing a physical vessel for landscape memory.

Clothing

Clothing was the object of enormous effort for all Inuit groups ethnographically. The entire community was implicated in the orchestration of seasonal movements to intercept species that were important sources of hide for clothing (especially caribou), and in the harvest itself (which sometimes employed elaborate communal drive systems). Women, however, devoted a substantial portion of their work-life to depilating, scraping and softening hides, and stitching them into a wide variety of weatherproof, durable and (sometimes) lightweight seasonal garments (Oakes 1991; Issenman 1997). The tools used to transform hides into clothing—ulu blades and handles, scrapers, beamers, cutting boards, awls, needles, needle cases, leather thimbles, thimble holders, and even strands of sinew thread—are all present, to varying degrees, in permafrost assemblages. As one might expect, items of clothing appear to have been heavily recycled, since substantially complete garments are uncommonly encountered. McCullough reports an exceptional collection of gut jackets and other items of clothing from the Canadian High Arctic (1989) and a large intact clothing assemblage was associated with the naturally mummified human remains at Qilakitsoq, West Greenland (Møller 1989; Hansen et al. 1991). Occasional small garments

(mittens, *kamik*s, insoles), fragments of processed hide (sometimes stitched), *kamik* soles, and the castoffs from sewing patterns occur fairly regularly. Such debris littered the floor areas of thirteenth-fourteenth century winter houses at Qariararyuk, and its distribution was a major determinant of spatial structure in the house assemblages (Whitridge 2004).

Clothing and boat cover manufacture by women are strongly expressed bioarchaeologically in dental grooves due to the preparation of sinew thread (Hansen et al. 1991), heavy dental wear, chipping and loss due to hide softening (ibid.; Merbs 1968; Scott and Winn 2011), musculoskeletal stress markers due to hide scraping (Merbs 1983), and cut marks on fingernails due to thread trimming (Hansen et al. 1991). A zooarchaeological footprint of hide acquisition and an archaeological record of clothing manufacture is complemented by this human osteological signature of hide processing, the rigors of which molded women's bodies over their working lives. The picture that emerges is of a sophisticated clothing system that aimed at ensuring mobility under the most dangerous environmental conditions, especially winter cold and open water at all seasons, and of a remarkably intimate association of clothing manufacture with women.

Shelters

The immobile sod house anchored precontact settlement rounds, in some areas in conjunction with the hybrid *qarmat*, which consisted of a removable skin roof erected over a somewhat durable semi-subterranean foundation. Other specialized dwelling types came into play during the brief summer, and while in transit at any season. The skin tent, consisting of stitched seal or caribou hides erected over a framework of wood poles, was the most characteristic. It was quickly assembled and could be flexibly conjoined with other tents or pitched according to varying floor plans. Tent rings vary from barely discernible gravel berms with a patch of vegetation marking the cooking area to heavily constructed boulder features with a central line of stones dividing sleeping and working areas, recognizable entrance gaps in the ring, and well-defined cobble hearths. This variability presumably reflects the length of stay and size and diversity of the group of occupants. Tent rings are often associated with winter houses, likely reflecting a shift out of thawing sod houses in late spring, occasional summer occupancy, and the early fall period of preparation of sod houses. Large tent camps occur at predictable char fishing and caribou hunting sites (e.g., Savelle 1987; Stewart et al. 2004), and small tent camps or single tent rings are thinly distributed all along coastal travel routes. Very small boulder structures, termed "hunter's beds" in Greenland (Gronnow et al. 1983), were used by individual travelers as overnight shelter under moderate weather conditions, the equivalent of a modern bivy sack with some provisional protection from bears (Figure 5.2), while isolated hearths may represent even more ephemeral stops. Given that temperature varies through a tolerably narrow range during the 24 hours of mid-summer daylight, at times a traveler moving quickly may have needed little shelter, subject to biting insects and rain.



Figure 5.2 Dave Craig next to floor of provisional shelter ("hunter's bed") on talus slope above North Arm, Saglek Fiord, northern Labrador, August 2013. Photo by the author.

The other widespread variety of travel shelter was the snow house (Boas 1964 [1888]; Jenness 1922), which emerged as a principal winter dwelling in parts of the Central Arctic with the breakdown in winter sedentism associated with the collapse of bowhead whaling and regional exchange networks (Whitridge 2002a). A snow block house could be erected wherever sufficiently hard drifts of at least 30–40 cm depth occurred. Rectangular slabs were excavated with a snow knife and stacked in an inward-tilting, ascending spiral until they closed to form a dome a couple of meters high. Half of the floor area was often left unexcavated as an elevated sleeping platform next to the lower cold trap, and a snow block tunnel provided additional wind protection and storage space if necessary. An oil lamp

helped maintain the interior a few degrees above freezing, skins provided bedding, and a shovel was used to pack snow into gaps between the blocks. It could be constructed on a range of scales, from a combined dance house and multi-family residence (Jenness 1922: 65–75) to a simple dog shelter. New snow houses are structurally sound (the roof can support an adult's weight) but over a period of days or weeks, depending on outside temperatures and the number of occupants, the inside progressively ices up from melting and refreezing of the snow, rendering a house uninhabitable. The very impermanence of the snow house propagated the cycle of mobility.

Sod houses and skin tents are Pleistocene technologies, but the snow block house appears to be a relatively recent Inuit innovation. While precontact snow house features have not been identified, the snow knives used to construct them are widespread in the Eastern Arctic (Mathiassen 1927), somewhat less so in the Mackenzie Delta region (Morrison 1990), and uncommon in North Alaska, where they appear to be a late introduction from the east (Ford 1959; Stanford 1976). The earliest unambiguous examples of snow knives seem to occur at early thirteenth century sites in the Canadian Arctic (e.g., Collins 1951; Taylor 1981; McGhee 1984; Whitridge 1999). The Inuit colonization of the Eastern Arctic thus appears to have coincided with the inception of a technological breakthrough (perhaps premised on a technological borrowing from Dorset groups, who possessed a version of the snow knife) that opened vast expanses of sea ice between the islands of the Arctic Archipelago to winter travel, harvesting and mobile settlement.

NAVIGATIONAL MARKERS

Another distinctive travel technology closely associated with Inuit culture—a fixed complement to the array of portable equipment—is the navigational cairn or *inuksuk*. While cairns of this general nature are undoubtedly ancient, Inuit developed them in numerous interesting ways as visual beacons on a mostly treeless and often snow-covered landscape, and have continued to utilize them through to the present (Hallendy 1994, 2000; Heyes 2002). For the most part individual *inuksuit* were nameless navigational referents, like the network of buoys that the Canadian Coast Guard installs each spring along arctic coasts and removes again each fall: interstitial rather than nodal. However they sometimes evoked the appearance of a person and could occur in significant clusters, such as a large grouping related to travel between Baffin Island and the Ungava mainland documented by Hallendy (2000). Though they articulated the natural and cultural landscapes at fixed points, *inuksuit* aimed to denote paths of movement *through* the world rather than create specific sites of activity or rest within it. Indeed, the particular locations at which they occurred often had no intrinsic meaning. The ambiguous character of *inuksuit* strains the archaeological understanding of 'place' the way a stray artifact forces us to grapple with the notion of 'site'.

Inuksuit

Inuksuit were typically composed of two or more stacked boulders, and were designed to be recognizable at a distance. Visibility was enhanced by situating them on heights of land where they would appear in profile with sky behind them, or where surrounding snow cover during much of the year would make them clearly stand out. As features that are consistently elevated above the surrounding terrain, the tips of *inuksuit* regularly attract perching birds. Over time, the chemical enrichment of the rock surface with guano nourishes various species of lichens, which gives many *inuksuit* an added crown of orange, black, white and/or pale green. Where raptors have selected them as lookouts they may also accumulate rodent bones at their base, and a wider organic halo. *Inuksuit* were constructed with whatever stone was at hand and varied from simple zen-like juxtapositions to imposing columns of carefully assembled stones. Although organic elements (antler, bone, wood) occasionally occur, unmodified cobbles, boulders, and slabs, in combination with in situ erratics and outcrops, were by far the dominant construction materials, making these features difficult to date. Lichenometric age estimates are imprecise (Savelle 1987), though coarse assignments of many features to the precontact period seem reasonable based on their regional association with datable settlement sites. Hallendy (2000) has outlined the wide range of functions they served in the recent past, and recorded names of dozens of types of *inuksuk* and superficially *inuksuk*-like structures. Some of these relate to the everyday operation of the harvesting economy, such as marking a meat cache or helping to drive caribou towards hunters' blinds, but many are navigational, indicating the best route to a settlement or marking a river crossing. Much of the rich contextual information Hallendy reports for southwest Baffin Island depends on the oral historical testimony of people who grew up on the land using such features, and so is increasingly difficult to recover in many parts of the Canadian north (efforts to document traditional knowledge surrounding *inuksuit* are ongoing, e.g., for northern Labrador, Larkham and Brake 2011; Kora 2014). For all their functional diversity, abundance, and relevance to contemporary communities, *inuksuit* barely register in early toponymic inventories. In an important Netsilingmiut ethnography Knud Rasmussen (1931) listed 452 place names, of which two are the generic '*inuksuk*', one is '*inuksukniq*' ("where *inuksuit* abound"), and one is '*napariartalik*' ("the place where something stands upright"). Less than 1 percent of Netsilingmiut toponyms make any reference to *inuksuit*, although to judge from surviving examples they must have been common. Prominent topographic features, settlements and harvesting areas were thoroughly and imaginatively named, but *inuksuit* were not.

The evidence suggests an ambiguous status for these features. They were potentially meaningful sites, sometimes carrying generic labels and very rarely individual names, but in many ways stood outside the envelope of everyday activity. Unlike other constructed features, *inuksuit* did not need to be visited to be used. Caches, fox traps, blinds, boat rests and hunter's beds were all assembled in similar fashion from locally available, unworked boulders, but were the focus of everyday activity when the respective site was in use. Even burial cairns,

also above ground boulder structures, were visited occasionally; items might be exchanged for mortuary goods, and offerings made to the spirits of the dead (Crass 1998). *Inuksuit* were sometimes deliberately altered to convey messages to other travelers (Heyes 2002) or to improve the performance of a caribou drive system, but for the most part they continued to function without any further intervention. Indeed, along with stone fish weirs (riverine analogues of caribou drive systems), hunting and navigational cairns constructed by earlier Dorset groups were the principal features to survive the great cultural break in the Eastern Arctic about 800 years ago, when Inuit migrants arrived. Hallendy reports various Inuktitut names for *inuksuit* constructed by pre-Inuit groups, who were considered by Inuit to have "prepared the land" (Hallendy 2000: 60) for them. Although the navigational references made by recently constructed *inuksuit* could presumably be deduced by travelers much of the time, the meaning that these older features would have had is unclear (some other pre-Inuit features, such as house depressions and tent rings, must have been relatively legible; Whitridge 2012). This sort of ambiguity is drawn out by the case of pinnacles.

Pinnacles

In much of the Canadian Arctic navigational *inuksuit* occur singly or in small groups, while *inuksuit* intended to direct caribou movements form long rows that converge on a water crossing, artificial pound, or group of hunting blinds. However in reporting some of the results of the Torngat Archaeology Project's northern Labrador surveys Susan Kaplan (1983: 522–526) described *inuksuk*-like structures that differ from these patterns. Labelled 'pinnacles', these typically consist of a single narrow rectangular slab about one meter long wedged upright in a bedrock crevice, or supported by smaller, blocky boulders at its base (which can give the structure a somewhat phallic appearance). Kaplan reports pinnacles at various locations on the Labrador coast north of Nain, but most spectacularly at Coffin Island where there are three clusters, the largest consisting of fifty pinnacles in two converging lines. Although the lines might evoke a drive system, caribou are rare stragglers in the area and in any case the irregular bedrock topography is not suitable for channeling game movements. Nor are they visible at a distance, although from a suitable direction and at close range they are skyclined.

A smaller concentration of pinnacles was observed by Jim Woollet and myself at Green Island, several kilometers north of Coffin Island, in 2008. At least fifteen structures, many collapsed, occur on a rocky slope in the center of the island. Again it is possible to skyline the pinnacles when close at hand (Figure 5.3), but like the Coffin Island features they are invisible from the shore and so would have been useless as navigational aids. A precontact Inuit winter settlement is found a kilometer or two away, but was only occupied briefly, and is out of sight of most of the pinnacles. Rather, they resemble the Coffin Island features in design and in lacking any obvious cultural associations. Their unusual distribution and heavy lichen cover suggest they predate the fifteenth century arrival of Inuit in the region.

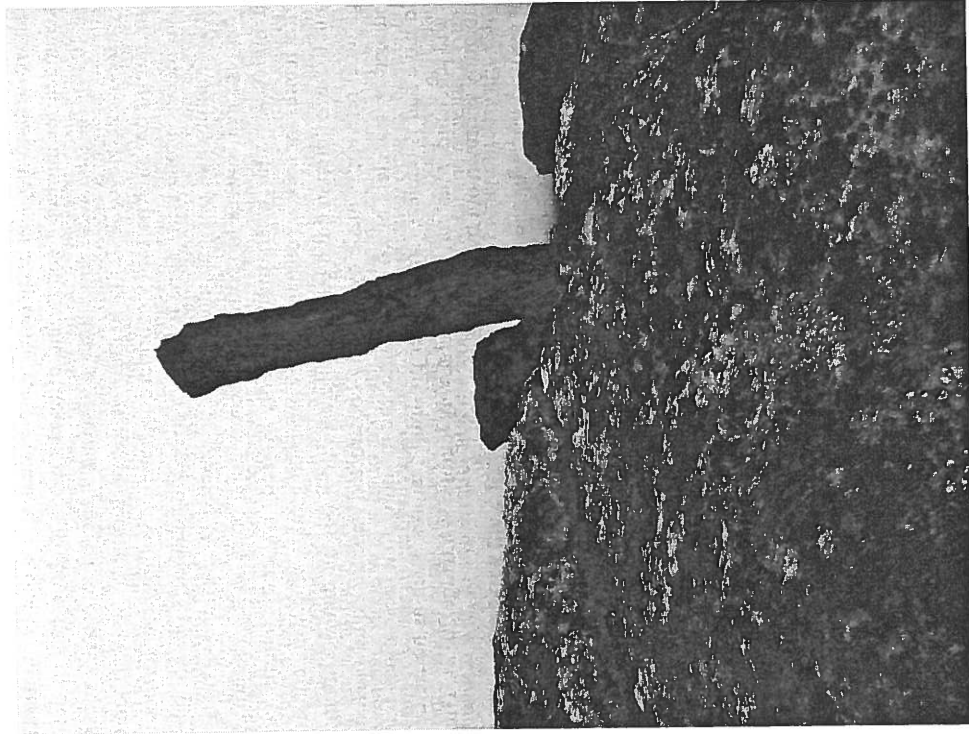


Figure 5.3 A “pinnacle”, likely pre-Inuit in age, at Green Island, near Okak, northern Labrador, July 2008. Photo by the author.

However, pinnacles do not always occur in substantial clusters. A solitary example was recorded 150 km to the northwest of Green Island at North Arm, in Saglek Fiord, in 2013 (Figure 5.4). It is near a cluster of precontact Inuit features, but is so well concealed in a rocky swale that it can only be seen from a few meters away. Characteristically, it is almost unphotographable because of its position and lichen cover, and is not sensible as an *inuksuk*-like feature that communicates at a distance. Traditional navigational *inuksuit* occur elsewhere in the North Arm region, where they mark travel routes into the interior (Kora 2014), and are often erected on massive erratics to enhance their visibility (Figure 5.5).



Figure 5.4 Pinnacle in a rocky swale, North Arm, July 2013. Photo by the author.



Figure 5.5 *Inuksuk* consisting of cobbles stacked on a massive rockfall, North Arm, August 2013. Photo by the author.

The northern Labrador pinnacles deviate from the *inuksuk* pattern in several important ways. They occur in large clusters, are found at a small number of locations, are relatively homogeneous in form, are inconspicuous or concealed at a distance, are constructed from distinctively elongated boulders, and can be considered historically and regionally distinctive since they do not occur throughout the Arctic and, though their precise age is uncertain, were not in use in historic or recent times in Labrador. In some ways they suggest one of the many functional variants of the *inuksuk* enumerated by Hallendy but differ profoundly from *inuksuit* in the key respect of visibility.

Inuit burial cairns arguably provide a better analogy for pinnacles than *inuksuit*. Cairns are often tightly clustered, forming cemetery-like groupings on uninhabitable slopes or outcrops discrete from residential areas. At Kongu, a nineteenth century winter village on Nachvak Fiord in northern Labrador, a large group of burial cairns strewn along the grassy slope above the site is easily recognized when close at hand but virtually impossible to resolve at a distance in an intermittently bouldery landscape, not unlike pinnacles. They are not designed to broadcast their location. Of course a principal difference between pinnacles and cairns is that Inuit cairns contained the remains of the deceased, and often grave goods or offerings, while there is no evidence that anything was deposited in association with pinnacles. But pre-Inuit Dorset and Predorset groups disposed of their dead in a fashion that, except in very rare instances, did not produce a mortuary record, likely by some form of disposal at sea or exposure on sea ice. It is tempting to read pinnacles as pre-Inuit memorials to the dead, perhaps—*inuksuk*-like—referencing travel between this world and another, and the Coffin and Green Island clusters as cemetery-like groupings. Their apparent age and disconnection from Inuit land use patterns support the case.

The *inuksuk* has become a popular icon of Inuit culture, and something more. It flies from northern flagpoles and branded the 2010 Winter Olympics. Depressing imitations litter lawns, hilltops and roadsides everywhere. This increasingly dense scatter of folk *inuksuit* has begun to submerge a rich archaeological record of Inuit landscape-knowledge practices in the north as well. But perhaps this has always been so; each cultural iteration rephrases what came before in an inexorable material cultural drift. Distinctive pre-Inuit cairn-building practices, including *inuksuk*-like features and perhaps pinnacles, gave way to *inuksuit*, precontact ones to historical ones, and historical ones, in some cases, to modern simulacra. GPS technologies, in turn, have assumed many of the *inuksuk*'s navigational functions (Aporta 2009), and drones rescue us from even walking the landscape at all. As a form of historical place-making, the *inuksuk* is a moving target.

OTHER TRAVEL TECHNOLOGIES

In addition to these constructed, archaeologically tangible technologies, there were a variety of landscape features and knowledge practices that were critical to Inuit travel but that are not as easy to access analytically. Features include repeatedly used human tracks and the trails produced by redundant non-human

animal movements. Arguably, the two closely overlap, since overland human travel likely made use of preexisting pathways created by other animals both out of convenience and because humans often pursued the very animals that created the tracks and trails (Whitridge 2013). Caribou trails, in particular, are readily visible in many parts of the Eastern Arctic, and especially in boggy or shrubby settings represent suitable pathways not just for travelling humans but for economically attractive prey other than caribou, such as foxes, wolves and bears. Definitive human trails have been observed at the scale of the site, for example connecting dwellings and a ceremonial structure at an important summer whaling village on southeastern Somerset Island (Savelle and Wenzel 2003), but travel at a regional scale seems unlikely to have produced a comparable trace. Any commonly used terrestrial sled routes over snow and frozen ground would have disappeared by early summer, and long distance summer travel and harvesting frequently employed watercraft. Most overland summer travel was likely swallowed into the regional scatter of game trails, wherever they existed.

A wider array of visible, surficial traces of prior land use—houses, caches, harvesting refuse—whether created by Inuit, contemporaneous but unrelated First Nations, or earlier groups who had colonized the north millennia before, constituted informative signs of the possibilities of a place (Whitridge 2012). Sophisticated knowledge of what were sometimes, effectively, archaeological traces, and likely understood as such, as well as other learned geographical information, were distilled in the place names that blanketed the landscape, anchoring a set of associations to each significant location (e.g., Müller-Wille 1987). Toponyms represented the historical accretion of Inuit traces on a newly colonized landscape, making it familiar in the first instance through the assignment of stock place names describing landscape features (point, bay, river, etc.; see, e.g., Wheeler 1953). In time, place names came to register a denser accumulation of local knowledge, referencing harvesting loci and the settings of historical and legendary events (see Aporta 2016, this volume, on the quantity of landscape knowledge inventoried by contemporary Igloodik place names). A neutral physical landscape was progressively infused with meaning through its articulation with a cultural imaginary that circulated in stories, songs, performances, children's games, artworks and other modes of representation (Whitridge 2004). Learned travel routes, a landscape-wide scatter of toponyms, and the navigational skills to practically triangulate them (e.g., Fortescue 1988) provided the cognitive complement to portable travel technologies and constructed spatial markers.

CONCLUSION

It is not surprising that the material record of Inuit travel practices is extraordinarily rich. The starkly seasonal Eastern Arctic environment, marked especially by the wind, bitter cold, snow cover and frozen ocean of its winter face, demanded a host of tactics and technologies for procuring food and manufacturing clothing and shelter. Travel was essential, whether to reach seasonal harvesting locales,

other communities, or trade fairs, or simply to explore the world. It was facilitated by large and small skin boats, dog-drawn sleds, portable subsets of an elaborate toolkit, insulating and waterproof clothing, and the skills to construct a variety of dwelling types appropriate to the season and the materials at hand. The landscape itself was altered in the course of Inuit travel, marked with cairns that oriented both travelers and the game being pursued. Culturally distinct cairn-building practices are apparent in some areas, hinting at older sets of travel technologies that Inuit—archaeologists in the lands they were beginning to settle—in part took over. An ever-expanding record of use and occupancy was archived in the toponyms that hitched places to a rich field of cultural representations—a geographical imaginary—and allowed them to accumulate and circulate in a variety of discursive genres. Together these constitute the distinctive technological, practical, and epistemological strands of a precontact Inuit ethnogeography, an emergent navigational science that appropriated novel tools and concepts as it drew an enormous toponymic net across the Eastern Arctic in the wake of Inuit colonization, punctuated with the *inuksuit* that facilitated spatial reckoning. Pre-Inuit groups navigated the Eastern Arctic for 3500 years, but with an almost entirely different—though equally interesting—scaffolding of tools, practices and knowledge. That the latter left almost no osteological trace makes the vaguely skyward pointing pinacles of northern Labrador suitably ambiguous markers of their disappearance. Inuit, for their part, are still here, and still on the move.

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